



UNIVERSITY CATALOGUE _



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ABOUT THE UNIVERSITY



The University of Technology Bahrain is decisive and transformative in its quest for more academic recognition and unprecedented commitment to excellence. With its viable blueprint and commitment to continue to serve as a key player in economic development and growth, UTB offers market-oriented programmes namely: Bachelor of Science in Business Informatics, Bachelor of Science in International Business, Bachelor of Science in Accounting and Finance, Bachelor of Science in Computer Science, Bachelor of Science in Informatics Engineering, and Bachelor of Science in Mechatronics Engineering, Master of Business Administration, Master of Science in Digital Marketing, Master of Science in Logistics and Supply Chain Management, NCUK International Foundation Year (IFY), Bachelor of Science in Environmental Engineering, Bachelor of Science in Informatics Engineering, Bachelor of Science in Mechatronics Engineering, Bachelor of Science in Information Technology in three majors – Applications Development, Networking, and Cybersecurity and Data Analytics and Artificial Intelligence.

UTB's ambition is to become the leading university in business, science, and technological innovation. It offers bachelor and postgraduate programmes that are on par with the best universities worldwide, taking pride in its programmes that have sustained the rigorous scrutiny of national and international accrediting bodies.

The business programmes, under the College of Administrative and Financial Sciences, include the Bachelor of Science in Business Informatics, Bachelor of Science in International Business, and Master of Business Administration. All these have received full accreditation status from the European Council for Business Education (ECBE), an international organization that ensures that its accredited members satisfy the requirements of the European Higher Education set out in the Bologna Process and other European standards. Considering that the global economy is dependent on business opportunities at large and several startups are booming to date, the college also offers a Bachelor of Science in Accounting and Finance,



Master of Science in Digital Marketing, and Master of Science in Logistics and Logistics and Supply Chain Management.

The College of Computer Studies offers a Bachelor of Science in Computer Science programme which is accredited by ABET (Accreditation Board for Engineering and Technology) CAC (Computing Accreditation Commission). The college also offers a Bachelor of Science in Information Technology from which students can progress to one of the three (3) majors; Applications Development, Networking and Cybersecurity, and Data Analytics and Artificial Intelligence.

The engineering programme offerings under the College of Engineering are Bachelor of Science in Informatics Engineering, Bachelor of Science in Mechatronics Engineering, and Bachelor of Science in Environmental Engineering. To train students in turning their hobby of keeping up with the latest advances in the field of information technology into a promising career.

In addition, the bachelor and postgraduate programmes, International Foundation Year programme, in collaboration with Northern Consortium of United Kingdom (NCUK), provide nine months of intensive skills training to international students. After completing NCUK International Foundation Year programme at UTB, students can progress to a wide variety of degree programmes in world-class universities in UK, USA, Canada, Australia, New Zealand and other popular study destinations.

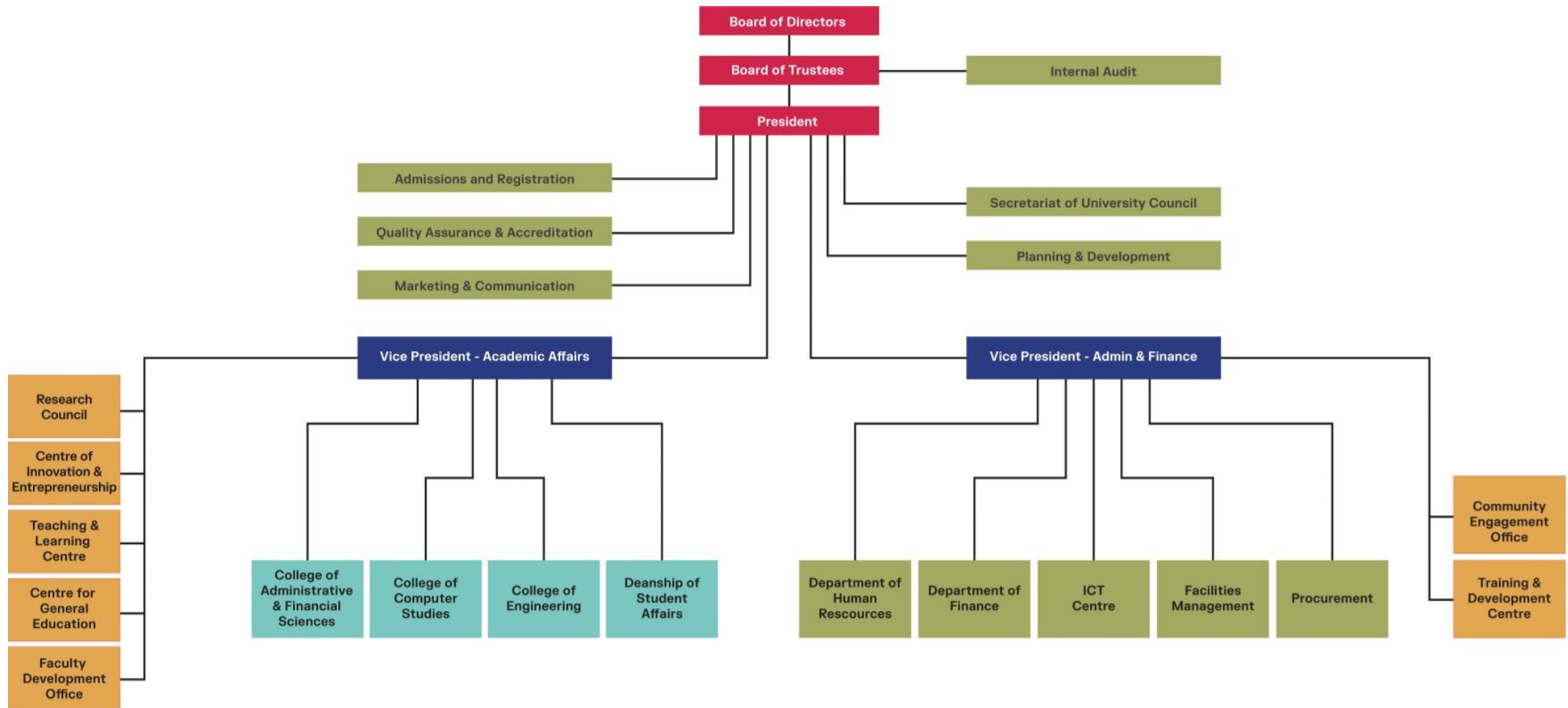
Visually, the UTB identity has been created with students in mind, focusing on a youthful application and modernistic representation through the use of dynamic typography and vibrant color, and shall be reflected in all aspects of the university's identity, marketing, and communications.

The university advocates an innovative and a student-centered approach to teaching and learning, coupled with a holistic vision of education that aims to develop students to their full potential and make them ready and employable for the world of work.

UTB provides a holistic education through internationally accredited business, engineering, and computing programmes. Our learning model provides students with a flexible, blended, and integrated learning approach. Students are given opportunities to implement concepts and principles in real-life situations. Such an approach ensures the development of work-ready graduates.

Obtaining a degree programme from UTB ensures the university's commitment to conform or even surpass the threshold of academic standards. Through the collaborative efforts of all stakeholders, UTB is ready to respond to new opportunities and developments with a commitment to expand its academic programme offerings.

UNIVERSITY ORGANOGRAM



MESSAGE FROM THE PRESIDENT

Your education at the University of Technology (UTB) centers on you and your success is our primary concern. All the university stakeholders – management, administration, faculty, and industry partners – work together to provide you with a conducive environment to develop essential knowledge and competencies, hence enhancing your capability to meet the expectations of the evolving labor market.

UTB is committed to serve as a key player in the provision of quality higher education in the Kingdom of Bahrain through its innovative programme offerings, namely: NCUK International Foundation Year (IFY), Bachelor of Science in Environmental Engineering (BSEnE), Bachelor of Science in Informatics Engineering (BSIE), Bachelor of Science in Mechatronics Engineering (BSME), Bachelor of Science in Information Technology (BSIT) in 3 Majors - Applications Development, Networking and Cybersecurity, and Data Analytics and Artificial Intelligence, Bachelor of Science in Computer Science (BSCS), Bachelor of Science in Accounting and Finance (BSAF), Bachelor of Science in Business Informatics (BSBI), Bachelor of Science in International Business (BSIB), and Master of Business Administration (MBA). These programmes come with countless opportunities, relevant curriculum options, and transformative avenues for your professional success.

Believe that you will be successful in whatever academic goal you set for yourself. May you find this catalog responsive as you plan your course of study. Likewise, you are also welcomed to visit the university workdays at your most convenient time.

I wish you all the best!

DR. HASAN ALMULLA

President





VISION

The University of Technology Bahrain will contribute to the advancement and application of knowledge and will have a transformative impact on the lives of learners and the society, whilst continuing to inspire students and the future generation to come.

MISSION

To contribute to the growth and sustainability of the economy and the expansion of human knowledge in business, science, and technology by fostering continuous innovation and excellence in education and research, strategic partnerships, international recognition, and entrepreneurial development.

VALUES

1. Excellence and quality
2. Professionalism
3. Creativity and Innovation
4. Growth and Development
5. Commitment and engagement
6. Collaboration
7. Integrity





UNIVERSITY RESOURCES AND FACILITIES

Administration Building

The administration building houses all administrative offices including the office of the President, the Office of the Vice President of Academic Affairs, the Office of the Vice President of Administration and Finance and all other offices of administrative officers. The university library is also located in the main administration building.

Academic Buildings

The academic buildings are equipped with the latest technology and will cater to the needs of business, engineering, and computer science students. The academic buildings are house the offices of the College Deans.

Admissions Office

The Admissions Office provides quality service and accurate information on educational opportunities to prospective and new students at the University.

Registration Office

The Registration Office maintains UTB student records that accurately reflect student achievements and implements an effective registration procedure. It maintains the Campus Information System (CIS) to ensure integrity, confidentiality, and security of student records.

Treasury and Accounting Office

The Treasury and Accounting Office provides financial information and reports to support the University community including academics, research, auxiliary, student services and public outreach organizations. The Office is responsible in providing timely, accurate, and meaningful financial information of students to the management.

IT Department

The IT department serves the computer-related needs of the students, faculty, and staff. It manages and maintains Internet-connected laboratories where students can use state-of-the-art computer facilities and access software and electronic resources to support their learning and research needs. Wireless network is provided to all students and members of the faculty and staff.



Deanship of Student Affairs (DSA)

The Deanship of Student Affairs (DSA) forms one of the most important pillars of UTB. DSA has a crucial role in any university and any educational institution as it has a major impact on the educational process, accreditation, and international ranking. The DSA provides counseling, academic advising, referrals, academic tutoring, student activities planning, and sports and recreational programmes to the admission office, registration office, and student services office. It provides support and resources for orientation, transition, retention, graduation, and pre-employment activities to better prepare UTB students both personally and professionally. The Office, located at the ground floor of the North Wing of the building aims to assist new students to easily adjust to life at the University.

Alumni and Career Development Centre

Alumni and Career Development leads in the development of strategy and delivery of career services to current students and alumni of UTB. He/she directs, supervises, plans, and monitors the activities of the ACDC and ensures that alumni will have the chance, variously, to contribute to the UTB community.

Centre for Teaching and Learning (CTL)

CTL is responsible for providing teaching and learning leadership through facilitating the development of teaching expertise and learner-centered approaches in teaching, supporting rigorous and thoughtful ongoing assessment and feedback to improve learning outcomes. The responsibility includes collaborating with academic departments and academic support units to promote a university-wide culture that values effective teaching and meaningful learning and supports excellence, inquiry, and innovation.

Clinic

Health Service is available from 8:00 am to 5:00 pm, Sunday to Thursday. Services include treatment of minor health emergencies and conditions, dispensing medication for minor health problems, and providing students with medical referrals.

Sports Facilities

The University provides sports facilities to support athletic activities, The Sports Facilities are equipped with amenities to support athletic activities and sports programmes of the university. It is part of the major expansion plan of the university. UTB contains several sports facilities equipped for students (including a football-Soccer field, Basketball court, Padel field, Tennis court, and Bing bong table)

Cafeteria

The University has restaurants and snack counters conveniently located at the ground floor to provide dining services to students, faculty, and staff.



Parking

The parking lot of the University can accommodate more than 500 vehicles at any given time. The parking area is for the use of faculty, staff, and students as well as special visitors and guests. Students, members of the faculty, non-academic staff, and officers are required to secure a car pass for the university gate.

Library

The University Library provides print collections of books, journals, theses, and research abstracts. The library print collection is supplemented by e-books and online journal subscriptions which are made available 24/7 to support the research activities of the students and the faculty.

The library catalogue and databases can be accessed on campus and off campus using a username and password assigned to every UTB student and faculty. The collection includes journals for business, information technology, natural and social sciences, and engineering.

Special services for students shall include orientation to the library services and collections, individual reference conference to persons undertaking major research papers, individual stations for audio and video materials, computer stations with internet access, and a Wi-Fi spot.



The University Library is open between the following time periods and days:

8:00 am – 8:00 pm (**Sundays to Thursdays**)

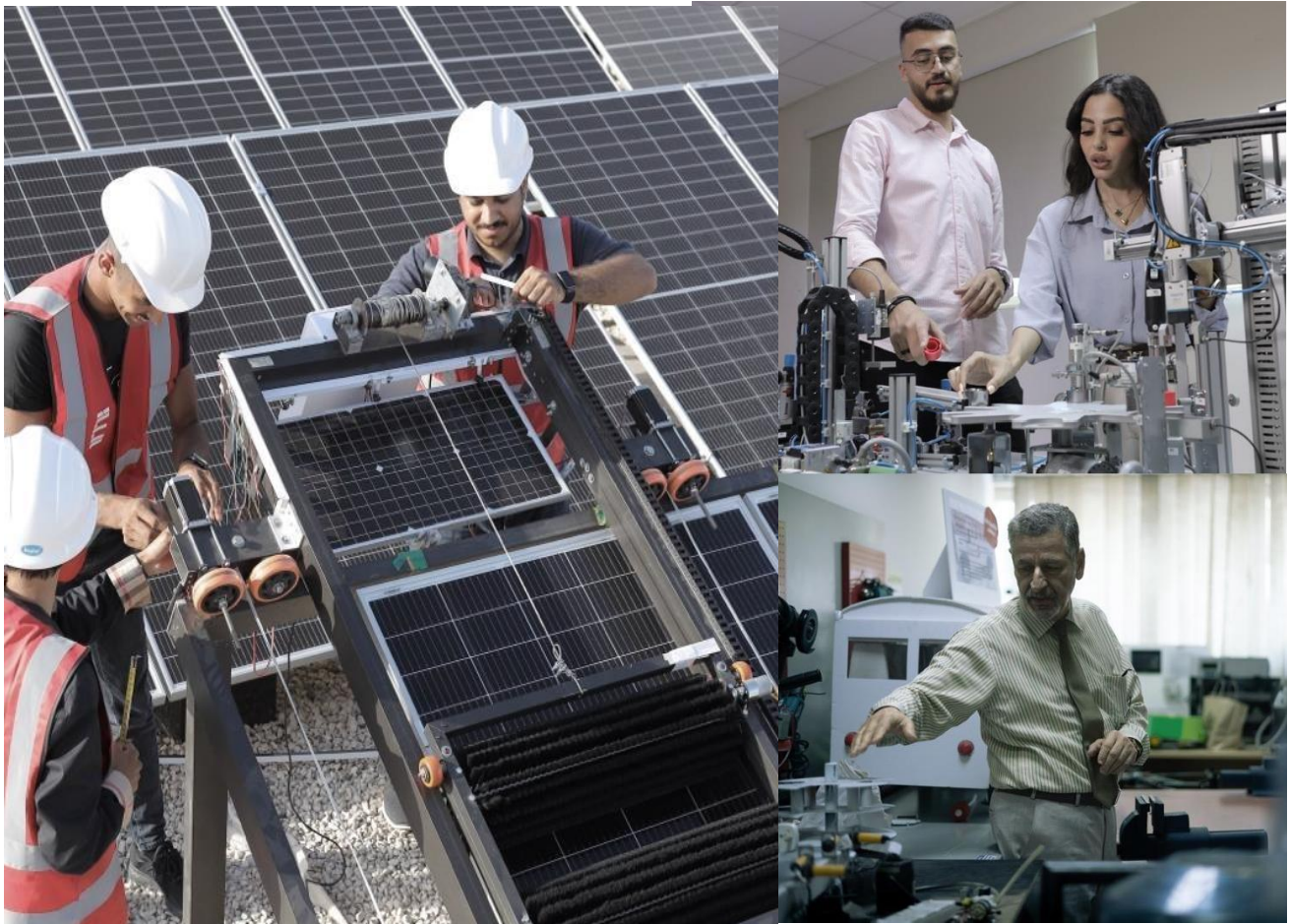
8:00 am – 4:00 pm (**Friday & Saturdays**)

Closed on Public Holidays



Mechatronics Laboratories

The Mechatronics Laboratory houses the pneumatics and electro-pneumatics sections and the Modular Production System. The Mechatronics Lab uses the FESTO Didactic Learning System for Automation and Technology. The systems and stations of the MPS facilitate industry – oriented training since the hardware consists of didactically suitable industrial components.



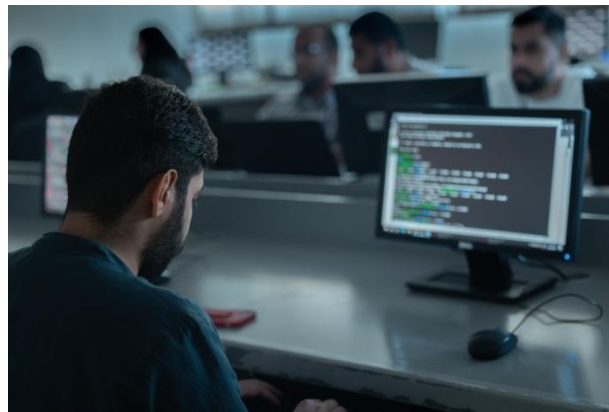
Digital Laboratory

The Digital Laboratory is well equipped with both De Lorenzo hardware and software facilities used by the students to perform the necessary experiments required in the Digital Systems course. Experiments are related to both digital hardware, electrical, and electronics circuits. The laboratory is equipped with all the hardware and software resources so that the students become adept in the basic field of digital electronics.



Computer Laboratories

Courses requiring the use of computers are held in any of the fifteen computer laboratories that occupy the west and north wings of the University. A dedicated laboratory used for the Cisco Networking Academy Programme is equipped with the latest Cisco routers and switches. The two Mechatronics laboratories can be found the west wing of the building for the enrichment of the engineering programme.



IMAC Laboratory

The IMAC laboratory is dedicated for graphics, multi-media development and computer animation courses of undergraduate and post graduate students. It is equipped with 25 units of iMac and Specialized Multimedia Development software such as Maya.





Networking Laboratory

This laboratory provides students enrolled in Data Communications and Networking Courses with access to the different Cisco and other networking equipment. The students learn how to design, build, manage, troubleshoot, and secure computer networks through various simulations and actual hands-on lab activities.

The networking laboratory is equipped with the following:

- 10 Cisco 1941 routers
- 3 Cisco 2811 routers
- 2 Cisco 2621 routers
- 4 Cisco 1751 routers
- 6 E900-ME Wireless-N Router
- 8 Cisco Stackable 3750 series switches
- 11 Cisco Catalyst 2960 series switches
- 13 V.35 Cable, DTE Male to Smart Serial, 10 Feet
- V.35 Cable, DCE Female to Smart Serial, 10 Feet
- 4 V.35 DTE Serial Cable, 10 Feet
- 4 V.35 DCE Serial Cable, 10 Feet
- 25 Intel Core 2 Duo Desktop PCs (Windows 7)
- Ethernet cables
- Cable-making and -testing equipment



Database Laboratory

This laboratory is equipped with database software, particularly Oracle. Students are provided with hands-on experience in using database software, including MySQL and MS Access.



STUDENT SERVICES

Guidance and Counseling Services

The Guidance and Counseling allow the students to discover their aptitudes and interests. The office has a staff that assists students in adjusting to university life, aids them towards self-knowledge and self-realization, and provides career counseling and continuing education.

Academic Advising

Students are assigned to an Academic Advisor upon admission and enrollment in the University. The Academic Advisor helps the student with his study plan and monitors his academic performance and progress throughout his stay in the University.

Student Clubs and Organizations

Student organizations include University Student Council, College Student Council, and other academic, and special interest organizations. Involvement in student organizations is important for a student in making new friends and provides the opportunity to share mutual interests with fellow students.

Orientation on University Policies, Offices and Support Offices

Students are given an orientation on university policies found in the Student Handbook, and other rules and regulations of the University. The Orientation includes a campus tour and a brief visit to the different support offices that students will later interact with throughout their campus life.

International Student Assistance

International students are provided with an orientation that will keep them comfortable during their initial stay at the University. This will also assist them in meeting other students who came from the same cultural backgrounds which will facilitate them gradually to feel at home and eventually develop a sense of belongingness among other students.

Visa Assistance

Foreign students, including transfer students, may be assisted in the processing of their student visas should there be problems encountered upon their application to the University. The Admissions Office is responsible for providing them with the necessary information kit that they would need to accomplish needed for Visa processing.



ADMISSION TO THE UNIVERSITY

For First Year Undergraduate Students

General Admission Requirements

A minimum score of 60% in the Secondary School Certificate (Thanawya) or its equivalent is required.

Applicants must submit a fully completed admission application form along with all required documents as per the university's guidelines and Bahrain Higher Education Council requirements.

Programme Specific Admission Requirements

The applicants who meet the following programme specific admission requirements will be admitted to UTB:

English Proficiency Skills Requirements

Applicants who fulfill one of the following English proficiency skills will be exempted from English foundation courses:

| Criteria | Score |
|---|---|
| Average Score in English Language Courses studied in the Secondary School Certificate (Thanawya) or its Equivalent | At least 80% or B <i>(for Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification)</i> At least 71% or B1 <i>(for Other Qualification (Indian, Pakistan, and West African))</i> |
| Private Schools - where <i>English Language is used as a mean of instruction</i> | Exemption from the foundation program. |
| TOFEL | at least 450 (paper based) or 131 (Computer - based) |
| IELTS | ≥ 5.0 or its equivalent |
| Pass English Placement Test | Score ≥ 51 % |

Mathematics Proficiency Skills Requirements

Applicants who meet the required average score in Mathematics courses from the Secondary School Certificate (Thanawya) or its equivalent will be exempted from the Foundation Math course:

| Subtest Component for <i>Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification</i> | | Programme | | |
|--|--|--------------------------------------|----------------------|----------------------|
| | | <i>BSME, BSEnE, BSIT, BSBI, BSAF</i> | <i>BSCS, BSIE</i> | <i>BSIB</i> |
| Mathematics | Science/ Technical/General Track | At least 70% or C | At least 70% or C | At least 60% or D |
| | Commercial Track | At least 80% or B | At least 80% Or B | At least 60% or D |



| | | | | |
|--|--|-------------------|---------------------------------------|-------------------|
| | Literature, Islamic and other non-technical Tracks | At least 80% or B | All must undergo remedial mathematics | At least 60% or D |
|--|--|-------------------|---------------------------------------|-------------------|

*This is applicable to Bahraini and similarly equivalent qualification

| Subtest Component for Other Qualification (Indian, Pakistan, and West African) | | Programme | | |
|---|--|--------------------------------------|---------------------------------------|-------------------|
| | | <i>BSME, BSEnE, BSIT, BSBI, BSAF</i> | <i>BSCS, BSIE</i> | <i>BSIB</i> |
| Mathematics | Science/ Technical/General Track | At least 51 or C1 | At least 51 or C1 | At least 41 or C2 |
| | Commercial Track | At least 71 or B1 | At least 71 or B1 | At least 41 or C2 |
| | Literature, Islamic and non-technical Tracks | At least 71 or B1 | All must undergo remedial mathematics | At least 41 or C2 |

Science Proficiency Skills Requirements

Applicants (except BSIB) who demonstrate proficiency in science will be exempt from attending tutorial classes in general science before enrolling in any university-level science course.:

| Criteria | Score |
|---|--------------|
| Average Score in Science Courses studied in the Secondary School Certificate (Thanawya) or its Equivalent | ≥60% |

For the undergraduate applicant who did not meet the minimum required secondary school grades in Mathematics and English or its equivalent, his/her admissions depend on the following criteria:

| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|------------------|--|---|--|
| All Programmes | 60-79 % grade in English | Score ≥ 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| BSIE, BSCS | For Scientific, General, and technical Track: Score 50-69% in Math | N/A | Foundation Course in Math |
| | Literature, Islamic and non-technical Tracks | N/A | Foundation Course in Math |
| | Commercial Track: Score 50-79% | N/A | Foundation Course in Math |



| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|-------------------------------|--|----------------------------------|---|
| BSME, BSEnE, BSIT, BSBI, BSAF | For Literature, Islamic and non-technical Tracks: Score 50-79% in Math For Scientific, General, and technical Track: Score 50-69% in Math | N/A | Foundation Course in Math |
| | For Science score <60% | N/A | Tutorial class in general sciences |
| BSIB | Score <60% in Math | N/A | Foundation Course in Math |
| All Programmes | CGPA <60% for Bahraini and KSA CGPA <41% for Indian and Pakistan | N/A | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

a. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

b. IELTS/TOEFL

Applicants who submit official IELTS or TOEFL certificates issued by accredited examination centers, with a minimum score of 450 on the TOEFL (paper-based), 131 on the TOEFL (computer-based), or 5.0 on the IELTS, are exempted from taking the required English Placement Test.

In addition, applicants who obtain an IELTS score of 5.5 or higher or a TOEFL score that meets the equivalent standard may qualify for English course exemptions based on their results. This policy recognizes academic achievement by allowing eligible students to be exempted from enrolling in introductory English courses upon admission.

| IELTS/TOEFL Scores | Exemption |
|---|---|
| Qualified applicants with 5.5 IELTS scores or TOEFL: 496 (paper-based) or 169 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 (English Communication Skills 1) |
| Qualified applicants with 6.0 IELTS scores or TOEFL: 546 (paper-based) or 211 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 and ENGL402/ENGL621 (English Communication Skills 1 and 2) |

c. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary



grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature, Islamic and non-technical tracks must take the remediation course in Math.

d. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

For Undergraduate Transferees

Application Requirements:

1. Completely filled out an admission application form
2. Official Transcript of Records (TOR) from the university previously attended. Rules and regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school certificates are to be applied when necessary.
3. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
4. Certificate of Transfer from the university previously attended stamped by MOE, if any.
5. Withdrawal Certificate stamped by MOE
6. Submission of all required documents stated in the admissions policy.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. The practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or a re-admitted student from UTB.

The University requires the undergraduate student to complete at least 50% of the required credit units/hours of a programme in residence at UTB. The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit unit/hours based on his/her original degree from another university.

For Postgraduate Students

Acceptance to the postgraduate programme as a new student depends on the following criteria:

- a. The applicant should have a bachelor's degree with a minimum CGPA of 2.00 out of 4.00.
- b. All Applicants will be interviewed by a panel of two members. Only successful applicants in the interview will be considered for admission. The right to admission to an applicant is left to the judgment of the panel members in cases where the relevant subject matter has not been conclusively demonstrated by the applicant's academic transcript.
- c. An applicant who is advised to take the OOPT must obtain a minimum passing score of 65 to proceed to the core courses. Applicants who do not achieve the passing score shall be required to complete the bridging courses before progressing to the core courses.



For MBA programme:

- An applicant who is a graduate of a bachelor's degree (in any area of business-related course) and has a minimum CGPA of 2.75 out of 4.00 or 2.00 out of 4.00 will be exempt from taking the bridging courses.
- An applicant who is a graduate of a bachelor's degree in a non-business field and is applying and has a minimum 2.00 out of 4.00 will be exempted from taking the bridging courses, provided he/she has minimum work experience of two years in any management-related field.
- An applicant who is not a graduate of a bachelor's degree not delivered in English, he/she will take the OOPT and should get a passing score of at least 65 to proceed to core courses, but if failed, he/she will proceed to foundation courses.

For MSDM, MSLSCM and MSRI programmes:

- An applicant who holds a bachelor's degree in any field other than business with a minimum CGPA of 2.00 out of 4.00, or its equivalent, must have at least one (1) year of post-bachelor's work experience.
- An applicant who is advised to take the OOPT must obtain a minimum passing score of 65 to proceed to the core courses.

For Postgraduate Transferees

Acceptance to the postgraduate programme as a transfer student depends on the following criteria:

1. UTB requires as a matter of policy that a transfer postgraduate student is required to complete at least 50% of the required credit units/hours of a programme of residence at UTB.
2. The maximum credit units/hours that are eligible for transfer credits should not exceed fifty percent (50%) of the required credits from the original degree from another university.
3. Capstone (Thesis) course is not eligible for credit transfer; the transfer student must take this course during his/her residency at UTB.

APPLICATION REQUIREMENTS

A new applicant is required to submit the following documents:

| First Year Undergraduate Students: |
|--|
| <ol style="list-style-type: none"> 1. Fill out the admission application form (Online SIS Emda or in person). 2. Original Secondary School Certificate and transcript or its equivalent and/or an 'A' Level Certification from the Ministry. Rules and regulations of HEC-Bahrain regarding the authentication of foreign certificates and/or private school certificates are to be applied when necessary 3. One (1) recent passport-size photographs 4. A photocopy of the applicant's passport and national ID card (or equivalent) 5. Official receipt of the non-refundable application fee 6. Certificate of Good Moral Character 7. Student Medical Examination issued by a medical health center endorsed by HEC. |
| First Year postgraduate Applicants |
| <ol style="list-style-type: none"> 1. fill out the admission application form (Online SIS or in person). 2. Original Secondary School Certificate and transcript or its equivalent and/or an 'A' Level Certification from the Ministry. Rules and regulations of HEC-Bahrain regarding the authentication of foreign certificates and/or private school certificates are to be applied when necessary 3. Official Transcript of Records for bachelor's degree or its equivalent. Rules and regulations of HEC-Bahrain regarding the authentication of foreign certificates and/or private school certificates are to |

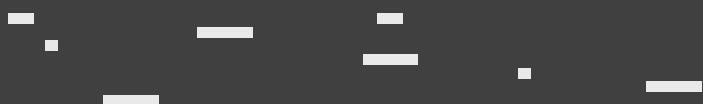


| |
|---|
| <p>be applied when necessary.</p> <ol style="list-style-type: none"> One (1) recent passport-size photographs. A photocopy of the applicant's passport and/or national ID card or at least 2 valid ID cards. Official Receipt of the non-refundable application fee. Student Medical Examination issued by a medical health centre endorsed by MOE. |
| Undergraduate and Post Graduate Transfer Applicants |
| <ol style="list-style-type: none"> fill out the admission application form (Online SIS or in person). Official Transcript of Records (TOR) from university previously attended. Rules and regulations of HEC-Bahrain regarding the authentication of foreign certificates and/or private school certificates are to be applied when necessary. Detailed criteria can be found in the Policies and Procedures for Credit Transfer. Course description for all completed courses for which transfer credit is sought (authenticated by the originating University) Certificate of Transfer from the University previously attended, if any Certificate of Good Moral Character Four (1) recent passport-size photographs A photocopy of the applicant's passport where name, photo, birth date and birthplace appear A photocopy of the applicant's national ID card (or equivalent) Official Receipt of the non-refundable application fee. Student Medical Examination issued by a medical health centre endorsed by MOE. |
| Foreign First Year Undergraduate Applicants |
| <ol style="list-style-type: none"> Fill out the admission application form (Online SIS or in person). Secondary Certificate and transcript or its equivalent (A level certificate if applicable) Four (1) recent passport-size photographs. Photocopy of the applicant's passport where name, photo, birth date and birthplace appear. Photocopy of the applicant's national ID card or equivalent Authenticated copy of transcript and certificate from the originating country's Ministry of Education or Embassy and the Ministry of Foreign Affairs in Bahrain. The University provides student visa assistance wherein requirements are found in the UTB Student Handbook. Student Medical Examination issued by a medical health centre endorsed by MOE. |
| Foreign Postgraduate Student Applicants |
| <ol style="list-style-type: none"> Fill out the admission application form (Online SIS or in person). Bachelor's Certificate and transcript or its equivalent Four (1) recent passport-size photographs. Photocopy of the applicant's passport where name, photo, birth date and birthplace appear. Photocopy of the applicant's national ID card or equivalent Authenticated copy of transcript from the originating country or Embassy and the Ministry of Foreign Affairs in Bahrain. The University provides student visa assistance which requires international students to pay a non-refundable tuition fee equivalent to one year of registration, if the visa is approved. Student Medical Examination issued by a medical health centre endorsed by MOE. |
| Students with Special Need |
| An applicant seeking admissions under this category needs to fulfill the same requirements for |



admissions as for the general candidates except for a consideration of 5% marks in the cut off percentage. The Guidance Counselor provides information and assesses the needs of the student applicant and the adjustments that he/she might require for him/her to access his/her chosen programme at the University.

The special needs student applicant has to disclose the nature of disability during the application process and the University reserves the right to accept/deny his/her admissions as it sees fit based on the nature of the disability and University's existing support mechanisms.



REGISTRATION

Registration Procedure for New Students

1. The student completes an online plotting form from the Admissions Office and fills it out indicating courses to be enrolled and the schedule.
2. The student submits the accomplished online plotting form to the Head of Admissions for verification and enlistment of the courses to be enrolled.
3. For Transfer students, the Head of Admissions initiates and sends online requests to the Dean of the accepting College for evaluation of transcript and possible crediting of courses completed and advises him/her as to what courses he/she may enroll in for the term.
4. The Dean sends the online evaluation of credits form to the Registrar for approval.
5. If approved, the Admissions Office proceeds with enlistment of the courses for the student as advised by the College Dean.
6. The student checks his/her assessment of fees in the eMADA-SIS, proceeds to pay fees either online or to the accounting department.

Registration Procedure for Continuing Students

- 1 The student pays the initial down payment and accomplishes the online plotting form in the eMADA-SIS.
- 2 The student chooses courses for the next term (as indicated in his/her Programme Plan) and chooses the schedule for the courses to enroll in for the next term.
- 3 Students can enlist courses between 12 credit hours (minimum) and 19 credit hours (maximum) except if the student is graduating for the term where he/she must take the remaining courses (if less than 12) and a maximum of 21 units.
- 4 The college dean evaluates the student who is under probation who can only enroll in 12 credit units/hours.
- 5 The student checks his/her assessment of fees in the SIS, proceeds to the payment of fees either online or to the finance department.
- 6 The student should ensure that his/her name is included in the class list of the course assigned to a faculty member.

Registration Procedure for Course Retake

A student can register for course re-take to improve his/her CGPA and qualify for graduation:

1. The adviser evaluates the list of courses that the student can re-take and the subject that is less than "C" can be enrolled based on the TCG history. In addition, the adviser must guide the student on how many remaining credits before graduation.
2. The student proceeds for enrollment and payment of fees which can be done online or through the finance department.
3. The previous grade shall be marked a number of times repeated, and whichever is the higher grade is included in the calculation of the cumulative CGPA.



FEES AND PAYMENT

The fee structure is as follows:

| | |
|---|---|
| Application Fee | BHD 25 (non-refundable, payable one time) |
| Registration Fee | BHD 50 (non-refundable, payable every term) |
| Technology Fee | BHD 30 (non-refundable, payable every term) |
| Undergraduate Fee | BHD 51.500 per unit/credit hour (BSME, BSIE, BSCS, BSBI, BSIB) |
| | BHD 75 per unit/credit hour (for BSIT, BSAF and BSEnE) |
| Postgraduate Fee | BHD 90.125 per unit/ credit hour (for MBA) |
| | BHD 169 per unit/credit hour (for MSc DM and MSc LSCM) |
| Postgraduate Thesis or Dissertation fee | BHD 750 (non-refundable and paid upon registration of the Thesis Course) |
| Graduation Fee | BHD 250 (non-refundable, payable one time) |

Fees are subject to change upon approval by the Higher Education Council (HEC) in Bahrain.

Students pay a registration fee at the beginning of every trimester. UTB accepts the following methods of payment for tuition fees:

1. Cash in Bahrain Dinars (BD)
2. Checks drawn on local banks in BD (If a student has a record of two or more checks returned due to insufficient funds)
3. articular student's check payments will no longer be accepted)
4. Direct transfers to UTB bank account. (Name and student must be noted on transfer)

All student financial transactions with the University are processed through the Accounting Office. Questions concerning student accounts should be directed to the said office.

Methods of Payment

A student can pay his/her tuition and other fees in cash during the scheduled enrolment period, which is until the last day of late registration. Partial payment is also available. The student should arrange the type of payment with the Accounting Office.

| Other Fees | |
|--|------------------|
| Transcript of records and Certificate (2 nd copy) | BD 3.000 |
| Term Fee for Residence | BD 50.000 |
| IC Fee | BD 50.000 |
| Lost Permit | BD 2.000 |
| Lost ID | BD 5.000 |
| Reprint COR | 500 Fills |



Tuition Fee Refund

Withdrawal of enrollment is allowed until the day before the Midterm examinations. However, charges will be based on the date of filing the withdrawal form at the Accounting Office whether the student has attended classes.

Refunds are governed by the University regulations as stipulated in the Student Handbook. All refund requests will be processed within 30 days.

If the student withdraws from the University or from an enrolled course/s during the trimester, refunds of tuition and fees will be calculated accordingly:

Withdrawal from the University

| Date of Filing | Refund |
|-----------------------------------|---|
| Before the start of classes | 100% refund of TOTAL FEES (Tuition and Miscellaneous fees excluding registration fees) |
| Within the first week of classes | 90% of the TOTAL FEES (Tuition and Miscellaneous fees excluding registration fees) |
| Within the second week of classes | 80% of the TOTAL FEES (Tuition and Miscellaneous fees excluding registration fees) |
| After the second week of classes | No Refund |

Note: Refund applies only to paid tuition and fees. Registration and application fees are non-refundable.



ACADEMIC POLICIES

Academic Load

Students are required to maintain full-time status except during the terminal trimester when they are allowed to enroll the only remaining courses to complete the academic requirements of the programme.

Undergraduate Student Load

The regular load for the undergraduate is 15-19 credit units/hours per trimester. The minimum load is twelve (12) credit units/hours per term and the maximum is nineteen (19) credit units/hours per trimester, ***except for those who intend to run for honors*** in which case the minimum load should be ***at least 15 units/hours per trimester***.

Graduate Student Load

The minimum and maximum load per trimester for graduate students is six (6) to twelve (12) credit units/hours in each trimester. ***However, for those who wish to run for academic honors, the minimum load is six (6) credit units/hours per trimester***, except on the terminal trimester of the programme.

Adding and Dropping of Course

- The official adding/dropping of courses begins on the third day after the start of classes and runs for 3 days. The schedule is extended for dissolved courses until one week before the prelim exam.
- The schedule and procedure for adding/dropping are posted in strategic locations of the University as well as in various university manuals.
- The student initiates the request for adding/dropping subjects and can add/drop or change the class schedule during the add/drop period using their account in the eMADA-SIS .
- The student submits the accomplished adding/dropping request to the College Dean for approval. If the reason for dropping is a conflict in the work schedule, the student is required to present a certification from his/her employer as a supporting document to his/her request.
- After securing the Dean's approval, the Dean forwards the approved adding/dropping transactions to the Registration office for approval of the Registrar.
- After the approval of the Registrar, the approved add/drop transaction is confirmed and the student's fees are automatically computed in the student's accounting ledger in the EMADA-SIS .

Prerequisite of Courses

A student is not permitted to take an advanced course until the student has satisfactorily passed the prerequisite course(s). A student is not allowed to enroll advanced courses in the higher level unless he/she passes all the required courses in a particular level. Request for waiver of prerequisite, however, may be approved based on its merit.



Leave of Absence

Students may interrupt continuous enrollment by opting to take a leave of absence from the University for medical or personal reasons or to engage in other off-campus educational experiences without dismissal from the University.

A student is allowed to file a leave of absence (LOA) from the University until the last day of late enrolment. The LOA will be reflected in the official transcript of records. If the student did not register and failed to submit the approved LOA form, the student will be included in the absence without leave (AWOL) list. A student on LOA may not participate in the co-curricular or extra-curricular activities during the duration of the LOA.

The student must ensure that filing the LOA will not result to being an inactive student. He/she shall be advised to see the Registrar for verification of status. The student becomes inactive when he/she has not registered for consecutive two (2) years (for undergraduate) and one (1) year (for graduate). Hence, the student shall be advised to secure the transfer credentials.

Shifting to another Programme

Shifting or transferring to another programme is allowed. All equivalent courses will be credited towards the new programme. The Registration Office shall provide the student with a copy of the credited courses under the new programme.

Transfer Credit Policy

The University requires, as a matter of policy, that a transfer student is required to complete at least 50% of the required credit units/hours of a programme of residence at the University.

The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) for undergraduate programmes and not exceed half (50%) for postgraduate programmes of the required credit units/hours from the original degree of another university. The Thesis/ Capstone courses are not eligible for credit transfer. The transfer student must take these courses during his/her residency at the University.

Minimum Programme Completion For undergraduate programmes

- An undergraduate student must spend at least ten (10) trimesters as a regular student at the University to be eligible for the bachelor's degree.
- It is expected that an undergraduate student will spend about four (4) years enrolled as a regular student to earn a bachelor's degree.
- The time spent at another institution combined with the time spent at the University must at least be equal to at least ten (10) trimesters as a regular student



For postgraduate programmes

A postgraduate student must spend at least five (5) trimesters at the University to be eligible for the master's degree.

Maximum Registration Rule

- Unless a programme specifies otherwise, the maximum time to complete a degree for undergraduate student is: *Eight (8) years including all approved leave of absences.*
- For postgraduate student, the maximum time-to-complete a degree is: *Eight (8) years including all approved leave of absences.*
- A student who has not completed the degree requirements within the maximum time limit is not allowed to continue in the programme started at the University.

Attendance and Tardiness

Students are required to attend classes regularly.

Absences

- A student must meet attendance of at least 80% (20% absences) throughout the trimester of the required total number of laboratory and lecture hours. A student in violation of the attendance policy will be given a grade of Dropped (DR) for the courses where the absences were incurred.
- A student who is dropped due to a violation of attendance will not be allowed to take the final examinations.
- An acceptance of valid excuse will not nullify the absence but will cancel any penalties normally imposed for absence at term exams, submission of projects, etc. (refer to special exam policy)
- Warnings are issued to a student regardless of the reason for the absences.
- A student will receive warnings from his/her teachers when the absences have reached 10% and before his/ her absences reach 20% of class time given for a course.

Absence with excuse

The absence of a student in the following cases is considered absence with an excuse and is not included in calculating the percentage of absences:

- Representing the government on an official mission.
- Representing the university or the country by taking part in sports competitions, academic competitions, skills competitions; and a call of duty in the Defense Force or Police.

The student must substantiate by evidence that the activities are contributing to the general welfare of the Kingdom of Bahrain in general and the university.



Grading System Grade Computation

All courses are graded based on planned assessments which may include examinations, term projects, assignments, cases, or laboratory reports. Equivalency between numeric grades (quality points) and letter grades are as follows:

| | | | |
|----------|------|----|--------------|
| 95-100 | 4.00 | A+ | Excellent |
| 91-94 | 3.89 | A | Very Good |
| 87-90 | 3.67 | A- | Very Good |
| 83-86 | 3.33 | B+ | Good |
| 79-82 | 3.00 | B | Good |
| 76-78 | 2.67 | B- | Good |
| 73-75 | 2.33 | C+ | Fair |
| 70-72 | 2.00 | C | Fair |
| 64-69 | 1.67 | C- | Fair |
| 57-63 | 1.33 | D+ | Satisfactory |
| 50-56 | 1.00 | D | Satisfactory |
| Below 50 | 0.00 | F | Failed |
| | IC | IC | Incomplete |
| | IP | IP | In Progress |
| | W | W | Withdrawn |
| | DR | DR | Dropped |
| | NG | NG | No Grade |
| | R | R | Repeated |

IC - Incomplete. This grade shall be given at the end of the term when all, but a minor portion of the coursework has been satisfactorily completed. (e.g. missed term or final exams, none submission of a major project or research requirement, etc.)

IP - In-Progress. Conditional grades given to undergraduate student who failed to submit course requirement(s) such as hardbound thesis, design projects, WBL completion certificates, or other terminal report(s) required by the course.

W - Withdrawn. Mark given to all courses currently enrolled by the student who officially withdrawn from the university before the 8th week of the trimester regardless of the academic standing of the student.

DR - Dropped. Mark given to a course(s) currently enrolled but was/were officially dropped by the student before the 8th week of the trimester (Midterm Period) regardless of the academic standing of the student in the particular course.

NG - No Grade. Conditional grade for MBA Thesis, wherein the student failed to complete the thesis within one year.

R Repeated. repeated and whichever is the higher grade is included in the calculation of the CGPA.



Grade Point Average (GPA)

It is the policy of the university to assess and evaluate the academic performance of the students by means of objective measure that reflects their academic achievement on a trimester basis (GPA) and continuous basis (CGPA).

Computation of GPA and CGPA

Only grades in academic courses are included in the computation of either the trimester GPA or the cumulative GPA (CGPA). Any grades earned by students from previous universities (transferred) are not included in the GPA and CGPA computations.

1. Computation of GPA

- a. Multiply the credit of each course by the corresponding grade points merited in each course to get the honor points.
- b. Add all the honor points to get the total.
- c. Divide the total points by the total number of credit units during the trimester; and
- d. Indices are computed to four decimal places rounded off to two.

2. Computation of CGPA

- a. CGPA is computed in the same manner as the GPA except that it includes all courses taken from the first term the student enrolled his/her first courses to the university up to the current trimester.
- b. If the course is repeated, only the new grade is included in the computation of the CGPA and not the previous grade.
- c. The previous grade of a repeated course is changed to "R".
- d. For the student who shifted /changed their programme within the University, only courses that are credit to the new programme are included in the computation of CGPA.

Course Retake

The student is allowed to retake a compulsory course that he/she failed (zero credit) in the previous trimester to become eligible for graduation. For general education courses, the student is allowed to retake the course for a maximum of five times while three times for professional courses. Moreover, the student may retake any course where he/she previously earned credits to improve his/her CGPA.

In both cases, the new grade is included in the calculation of the cumulative PA and not the previous grade.

Grade Appeals

Grade complaints will be entertained only within one week after the posted schedule for grade distribution. Grade complaints will not be entertained after the said period. A grade complaint must be received by the Guidance Counsellor no later than the last day for filing grade complaints. Students must ensure that there is a valid basis for the grade complaint.



Academic Standing

Undergraduate Students

To be considered in good academic standing, an undergraduate student must maintain a GPA of at least "C" every term and a CGPA of at least "C".

Postgraduate Students

To be considered in good academic standing, a graduate student must maintain a GPA of at least "B" every term and a CGPA of at least "B".

A student must be in good academic standing to be eligible for graduation.

Scholastic Delinquency for Undergraduate Students

Student Notice

An undergraduate student who fails in 50% of the total units enrolled in the term will be classified as under Student Notice. The student will receive a written reminder from the College Dean for the student to improve his/her academic performance in the following term.

A student is issued a STUDENT NOTICE by the College Dean if the CGPA for the term is at least 2.01 and passed in 50% of the total units enrolled for the term.

Academic Probation

A student with CGPA of at least 2.01 and who failed in 75% of the total units enrolled in the term will be classified as under **Academic Probation** and will be placed on the PROBATIONARY status list.

- A student who has received STUDENT NOTICE for two consecutive terms will also be placed on the PROBATIONARY status list.
- A student is issued an ACADEMIC PROBATIONARY Notice by the College Dean.
- A student placed under PROBATIONARY status will be allowed to 12 credit units/hours in the succeeding term to improve the academic performance.
- A student will be removed from the PROBATIONARY status list upon passing at least 75% of the total units enrolled in the succeeding term and obtaining a CGPA of 2.0 or C or better.

Dismissed Status

A student with a GPA of 0.00 or failed in 100% of the total units enrolled in the term will be **dismissed from the University**.

A student who received PROBATION NOTICE for two consecutive terms will also be dismissed from the University.

- A dismissed student may submit an appeal for re-admission. After evaluation and if the Dean finds merit in the appeal, the letter will be recommended for approval of the VP of Academic Affairs.
- A re-admitted student will be allowed to enroll 12 units in the succeeding term.
- A student with denied re-admission appeal will be advised to transfer to other institutions and will be given honorable dismissal and transcript of record after all University clearances are accomplished.



Scholastic Delinquency for Graduate Students

Academic Probation

- A postgraduate student who incurs a failing mark (F) in at least one course enrolled in one term will be under academic probation.
- A postgraduate student who incurs a GPA below 3.0 or B in any trimester will be under academic probation. Thus, the minimum grade that a graduate student should get in any enrolled course is C, but the student is required to maintain a GPA of at least 3.0 or B to be of good academic standing.

Double Academic Probation or Dismissed Status

A postgraduate student who is under academic probation and incurs a failing mark (F) in at least one course enrolled in any succeeding term will be under double probation and will be dismissed from the programme.

Academic Honors

A. Graduation with Honors

The University awards academic honors at graduation. To qualify for the awards, a student must have achieved the required cumulative GPA and these are:

| | |
|-------------------------------|-------------------------------|
| Distinction with First Class | Cumulative GPA of 3.90 – 4.00 |
| Distinction with Second Class | Cumulative GPA of 3.70 – 3.89 |
| Distinction | Cumulative GPA of 3.50 – 3.69 |

Conditions:

1. The award is noted on the transcript of the student awardee.
2. The award is given to both undergraduate and postgraduate students regardless of credit hours registered every trimester.
3. No record of any disciplinary actions or violations of the Student Code of Conduct.
4. The award is granted to a student who has achieved the required credit units prescribed by the University and or the Higher Education Council.

B. Academic Excellence

To qualify for academic excellence, the student must have:

1. CGPA of at least 3.33 (new system)/ 1.75 (old system).
2. Enrolled at least 12 units per trimester.
3. No grades lower than 1.33 (new system)/ 2.75 (old system).
4. No academic violation.
5. No involvement in any form of conduct violation; and
6. No grade lower than B from the previous university attended (if applicable);
7. No grade of DR or W in any course.



Procedure for Confirmation of Graduation Eligibility:

- The Registration Office accepts applications for graduation two weeks after the release of the grades.
- The students apply for graduation by filling out a form available at the Registration's Office.
- The Registration Staff evaluates the scholastic records and other requirements for graduation.
- The Registration Office posts the list of candidates for graduation categorized according to students without deficiency and students with deficiency. If the student is found to have any deficiency, he/she will be advised to take the course in the immediate term for re-evaluation for eligibility for graduation in the next term.
- The Registration Office forwards records for graduation to the Auditor. If there are exceptional cases, the Registration Head refers the matter to the Dean of Student Affairs who decides depending on the merit of the case.
- The Academic Council conducts the deliberation for graduation. It sees to it that the courses were successfully passed with a minimum of CGPA of 2.0 (for undergraduate) and 3.0 (for postgraduate) and other requirements completed to confirm graduation.
- The Registration Office prepares the final list of the graduating students as soon as the Academic Council completes its task.
- Students who are confirmed to be eligible for graduation accomplish a clearance form and completes the clearance procedures for the release of his/her certificate, diploma, and transcript of records.



STUDENT RIGHTS AND RESPONSIBILITIES

All members of the University community are entrusted with academic integrity, which encompasses the fundamental values of honesty, trust, respect, fairness, and responsibility.

As members of the academic community, students have both rights and responsibilities. The University allows its students to make their own decisions and assume full responsibility for the consequences of their actions. The rights and responsibilities outlined below are designed to protect the rights, safety, and property of all members of the University.

- All students have the right to quality instructions under conditions conducive to learning and research.
- All students have the right to equal opportunity and equal access to academic programmes and academic resources and open intellectual inquiry.
- Students have the right to be represented in the different Institutional and College committees/councils and participate in institutional **decision-making**. Students have the right to voice out their opinion about the University and participate in the annual student satisfaction survey and trimester course and faculty evaluation.
- All students have the right to academic freedom that allows them to freely express their views while respecting the rights and freedom of others.
- Recognized Student organizations/clubs have the right to conduct group meetings inside the University building. They can hold activities inside the University and invite guest speakers from outside the University to speak during the activity subject to approval of the faculty/staff advisor and the head of the Guidance Counsellor and DSA.
- Each student has the right to check and review and discuss with their teachers their academic records such as course grades, graded assignments, projects, research, reports, term examinations, record of attendance and other work submitted by the student, evaluated by the faculty handling the course and included in determining the final grade in the course.

The most important of the responsibilities is to respect the rights of other members of the academic community and to conform to standards essential to the purposes and processes of the University.

It is the responsibility of the student to be prepared, prompt, attentive, and courteous in the classroom and conform to policies set by the faculty member to maintain academic decorum.

Students, faculty, and staff are expected to help maintain the quality and integrity of the educational process by conducting themselves in a truthful and ethical manner.

Any violation of academic integrity represents an erosion of academic standards and should not be tolerated by the faculty or the student. Knowledge of any violations should be reported and dealt with through established policies and procedures.



Student Code of Conduct

The University is committed to the educational and personal growth of its students. Behavior that infringes upon rights, safety, or privileges or that impedes the educational process is unacceptable and may lead to sanctions up to and including dismissal from the University. (Complete list of offenses and corresponding sanctions are discussed in the section for Student Discipline of the Student Handbook)

Authority for Student Discipline

The ultimate authority for all University policy is vested in the President the University. Non-academic disciplinary authority is delegated to the Dean of Student Affairs, who implements student conduct policies and takes all necessary and appropriate action to protect the safety and well-being of the students in the campus community.

A Student Disciplinary Tribunal, composed of student, faculty, non-teaching staff and representatives is created by the Head of Student Services to ensure just, speedy, and constructive resolution of problems arising from infractions of the student code of conduct. The committee considers the complaints, conducts hearing, and recommends resolutions or appropriate sanctions.

Faculty Authority

The authority and responsibility to implement academic honesty and impose disciplinary measures is vested to the faculty member assigned to teach a course.

Cases resulting from alleged violations of the University's academic honesty policy are within the jurisdiction of either a faculty member or the dean of a college in which the alleged violation has occurred. However repeated violation of established academic policies is subject to filing of a formal complaint to the Student Disciplinary Tribunal for the conduct of hearing, deliberation, and assignment of appropriate sanction.



ACADEMIC PROGRAMMES

The University offers baccalaureate degrees that respond to regional needs of the Kingdom of Bahrain and the Gulf region, drawn upon the regional strengths, and prepare graduates to participate successfully in communities in the region and around the globe. It has three colleges that cater to the education training needs in business, computer science, and engineering.

UTB graduates will be able to:

- demonstrate specialised knowledge, skills, and competencies in their chosen fields of study and apply this ethically in real-life contexts;
- plan and undertake projects or research and develop reasoned and creative solutions;
- develop a variety of intellectual skills, including analytic inquiry, information literacy, diverse perspectives, and quantitative fluency in drawing reasonable conclusions;
- communicate effectively, using academic and professional conventions, both orally and in writing, to diverse audiences; and
- collaborate positively with others to achieve a common purpose.

College of Administrative and Financial Sciences (CAFS)

- Bachelor of Science in Business Informatics (BSBI)
- Bachelor of Science in International Business (BSIB)
- Bachelor of Science in Accounting and Finance (BSAF)
- Master of Business Administration (MBA)
- Master of Science in Logistics and Supply Chain Management (MSLSCM)
- Master of Science in Digital Marketing (MSDM)
- Master of Science in Real Estate Management and Investment (MSRI)

College of Computer Studies (CCS)

- Bachelor of Science in Computer Science (BSCS)
- Bachelor of Science in Information Technology (BSIT)

College of Engineering (COE)

- Bachelor of Science in Informatics Engineering (BSIE)
- Bachelor of Science in Mechatronics Engineering (BSME)
- Bachelor of Science in Environmental Engineering (BSEnE)



College of Administrative & Financial Sciences (CAFS)




| | |
|--|--|
| 1. Teaching Institution | University of Technology Bahrain (UTB) |
| 2. University Department | College of Administrative and Financial Sciences |
| 3. Programme Title | Bachelor of Science in Business Informatics (BSBI) |
| 4. Title of Final Award | Bachelor of Science in Business Informatics (BSBI) |
| 5. Mode of Attendance | Actual classroom learning-interactive |
| 6. Delivery Mode | Traditional Learning |
| 7. National Qualification Framework Level and Credit | NQF Level 8 540 NQF Credits (180 ACS Credits) |
| 8. Accreditation | European Council for Business Education Standards (ECBE) |
| 9. Other external influences | Local External Influences/References <ul style="list-style-type: none"> Ministry of Education (MOE), Higher Education Council (HEC) Bahrain Education and Training Quality Authority (BQA) International External Influences/References <ul style="list-style-type: none"> ACM/AIS Curriculum Guidelines QAA-UK Subject Benchmark Statement: Computing 2019 QAA-UK Subject Benchmark Statement for General Business and Management 2019 Association to Advance Collegiate Schools for Business (AACSB) |
| 10. Date of production/revision of this specification | September 2021 |
| 11. Aims of the Programme | |
| <p>The Bachelor of Science in Business Informatics (BSBI) programme provides in-depth knowledge and skills required to understand, analyze, evaluate, implement, use, and manage information systems in organizations. It produces graduates with solid business background who understand the role of information technology in improving efficiency and effectiveness of operations in organizations and who develop and execute the capability of providing IT solutions to meet specific business needs.</p> <p>Graduates of the programme, three (3) to five (5) years after graduation, shall be able to:</p> <ol style="list-style-type: none"> Possess expertise in systems thinking in order to develop and manage information and communications technology (ICT) solutions which enable enterprise development and business process improvement and innovation. Engage in business informatics careers and/or be a responsive member of a business organization and society with awareness of professional ethics, responsibilities, values and standards. Transfigure knowledge, understanding and academic skills through postgraduate study and/or continuing professional development. | |
| 12. Learning Outcomes, Teaching, Learning and Assessment Methods | |
| <ol style="list-style-type: none"> Demonstrate advanced knowledge and skills in the practical and logical foundations of informatics and the business functional areas and their processes. | |

2. Demonstrate critical knowledge and understanding of the different information systems in business organisations, their concepts, principles, frameworks, models, design and development tools, requirements, methodologies, and standards.
3. Use advanced and some specialist level skills to develop and design information systems and adapt suitable business applications for management decision making and in meeting business needs.
4. Use a range of approaches to critically analyse, evaluate, and synthesise data and information in formulating solutions to business problems and issues.
5. Utilise specialist-level skills in dealing with complex business situations and problems through IT projects, research, and in benchmarking organisational best practices in improving and innovate business processes, operations, and organisational systems.
6. Apply a range of approaches to critically analyse and evaluate information systems and applications and business models to identify, define, and interpret situations and implement relevant solutions.
7. Communicate clearly, effectively, and successfully with peers, colleagues, and specialists in conveying and presenting complex information, ideas, and projects with the use of appropriate tools, techniques, and technology.

Operate and function effectively as an individual or member/leader of a team or organisation with the value of recognising the need for responsibility and engagement in life-long learning; and promote ethical and professional behavior in organisations and society.

Teaching and Learning Methods

1. Constructive Method. Learners must be fully engaged and active in the process of constructing meaning and knowledge based on their prior knowledge and experiences through the process of doing, making, writing, designing, creating, and solving. It allows teachers to implement differentiated learning, authentic assessment practices and incorporate technologies to improve individual learning experiences. It includes simulations, in-course projects, field trips, digital content, group discussions and reflections. This method strives to improve achievement by consciously developing learners' ability to consider ideas, analyze perspectives, solve problems, and make decisions on their own thereby making them more responsible and independent.
2. Inquiry based Method. Learners develop cognitive skills like critical thinking and problem solving by working on questions, problems, or scenarios and formulate creative solutions. The teachers use either structured, guided, or open inquiry to facilitate learning. As a process, learners are involved in their learning by formulating questions, investigating, building their understanding, and creating meaning and new knowledge on a certain lesson. Typical activities include laboratory sessions and research-based activities.
3. Collaborative Method. Learners are divided into small groups to learn something together and capitalize on one's other resources and skills, evaluating one another ideas, and monitoring one another's work. It allows students to actively interact by sharing experiences and take on different roles. Typically, students are provided with problems or projects that they work on together to search for understanding, meaning, or solutions and each group is expected to work together developing or formulating solutions and present the solution in class. The activities include think-pair-share, jigsaw, or round-robin which effectively engage students to complete the tasks.
4. Experiential learning method is the process of learning by doing. By engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. This may include team challenges, simulations, company visits/fieldworks and other extracurricular activities. Experiential learning opportunities exist in a variety of course- and non-course-based forms and may include community service, service-learning, undergraduate research, study abroad, and culminating experiences such as internships, student teaching, and capstone projects.

| | | |
|--|---------------------|-----------|
|  University of Technology Bahrain | Doc. No. | QR-AAD-01 |
| | Revision No. | 01 |
| | Date of Effectivity | 01-09-23 |
| College: College of Administrative and Financial Sciences | | |
| BSBI PROGRAMME SPECIFICATIONS AY2021-2022 | | Page 45 |

Assessment Methods

Assessment is done independently for each course. A variety of assessment tools will be used to assess the achievement of intended learning outcomes including but not limited to exams, assignments, projects, case analysis and presentations. In addition, assessments of learning outcome also include capstone, internship, and indirect assessment.



13. Programme Structure

BACHELOR OF SCIENCE IN BUSINESS INFORMATICS (BSBI)
CURRICULUM PLAN EFFECTIVE AY2021-2022

FOUNDATION CLASSES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--------------------|---------------------------|----------------|----------------|---------------------|-----------------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---------------------------------------|----------------|----------------|---------------------|------------------------|
| ENGL401 | English Communication Skills1 | 3 | 0 | 3 | |
| HIST400 | History of Bahrain and the GCC Region | 3 | 0 | 3 | |
| MATH401 | College Algebra | 3 | 0 | 3 | |
| SOCI400 | Sociology | 3 | 0 | 3 | |
| BUSI615 | Principles of Management | 3 | 0 | 3 | |
| COMP613 | Fundamentals of Information Systems | 3 | 0 | 3 | |
| EUTH400 | Euthenics 1 | 1 | 0 | 0 | |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-----------------------------------|----------------|----------------|---------------------|------------------------|
| ENGL402 | English Communication Skills 2 | 3 | 0 | 3 | ENGL401 |
| BUSI621 | Organizational Behavior | 3 | 0 | 3 | |
| BUSI622 | Financial Accounting 1 | 2 | 2 | 3 | |
| BUSI633 | Microeconomics | 3 | 0 | 3 | |
| BSBI625 | Principles of Banking and Finance | 3 | 0 | 3 | |
| COMP623 | Business Information Systems | 2 | 2 | 3 | |
| EUTH401 | Euthenics 2 | 1 | 0 | 0 | EUTH400 |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-------------------------------|----------------|----------------|---------------------|------------------------|
| ARAB400 | Arabic Language | 3 | 0 | 3 | |
| ENGL403 | Speech and Oral Communication | 3 | 0 | 3 | ENGL402 |
| HUMR400 | Human Rights | 3 | 0 | 3 | SOCI400 |

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| | | | | | |
|--------------|---------------------------|---|---|----|---------|
| BUSI631 | Principles of Marketing | 3 | 0 | 3 | |
| BUSI632 | Human Resource Management | 3 | 0 | 3 | BUSI621 |
| BUSI713 | Macroeconomics | 3 | 0 | 3 | BUSI633 |
| TOTAL | | | | 18 | |

SECOND YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|------------------------|
| ENGL502 | Technical Writing | 3 | 0 | 3 | ENGL403 |
| MATH403 | Business Statistics | 3 | 0 | 3 | MATH401 |
| BUSI711 | Managerial Accounting 1 | 3 | 0 | 3 | BUSI622 |
| BSBI711 | Bahrain Business Environment & Cross-Cultural Management | 3 | 0 | 3 | |
| COMP711 | Introduction to E-Commerce | 3 | 0 | 3 | COMP613 |
| COMP712 | Computer Programming1 | 2 | 2 | 3 | COMP613 |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-----------------------------|----------------|----------------|---------------------|------------------------|
| ENVM400 | Environmental Management | 3 | 0 | 3 | |
| BUSI721 | Quantitative Methods | 3 | 0 | 3 | MATH403 |
| BUSI712 | Mathematics of Investment | 3 | 0 | 3 | MATH401 |
| COMP721 | Database Management Systems | 2 | 2 | 3 | COMP712 |
| COMP722 | Human-Computer Interaction | 3 | 0 | 3 | COMP711 |
| COMP723 | Computer Programming 2 | 2 | 2 | 3 | COMP712 |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--------------------------------|----------------|----------------|---------------------|------------------------|
| BSBI731 | Research Methods | 3 | 0 | 3 | MATH403 |
| BSBI732 | Technopreneurship | 3 | 0 | 3 | BUSI631 |
| BSBI733 | Financial Management | 3 | 0 | 3 | BSBI625 |
| COMP731 | Systems Analysis and Design 1 | 2 | 2 | 3 | COMP721 |
| COMP732 | IT Infrastructure | 3 | 0 | 3 | COMP711 |
| COMP733 | Mobile Application Development | 2 | 2 | 3 | COMP723 |
| TOTAL | | | | 18 | |

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THIRD YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---|----------------|----------------|---------------------|-------------------------------|
| BUSI811 | Islamic Banking and Finance 1 | 3 | 0 | 3 | BSBI733 |
| BSBI812 | Business Process Management | 2 | 2 | 3 | COMP721 |
| BSBI813 | Bahrain Business Law and Taxation | 3 | 0 | 3 | BSBI711 |
| COMP811 | Systems Analysis and Design 2 | 2 | 2 | 3 | COMP731 |
| COMP812 | IS Strategy, Acquisition and Management | 3 | 0 | 3 | COMP732 |
| BSBI814 | Elective1 | 3 | 0 | 3 | 3 rd Year Standing |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---|----------------|----------------|---------------------|------------------------|
| BSBI821 | Operations Management | 3 | 0 | 3 | BUSI721 |
| COMP821 | Information Management, Security, and Support | 3 | 0 | 3 | COMP732 |
| COMP822 | Web Design and Development | 2 | 2 | 3 | COMP731 |
| COMP823 | Project Management | 2 | 2 | 3 | COMP812 |
| COMP824 | Data Mining & Warehousing | 2 | 2 | 3 | COMP721 |
| COMP825 | FinTech | 3 | 0 | 3 | BSBI733 |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|-------------------------------|
| BSBI831 | Digital Marketing | 3 | 0 | 3 | COMP711 |
| BSBI832 | Business Planning | 3 | 0 | 3 | COMP823 |
| BSBI833 | BSBI Capstone Project A | 3 | 0 | 3 | COMPLETED 144 Units |
| BUSI831 | Business Analytics | 2 | 2 | 3 | BUSI721, COMP824 |
| COMP832 | Enterprise Systems Management and Applications | 2 | 2 | 3 | BSBI812 |
| COMP833 | Elective 2 | 2 | 2 | 3 | 3 rd Year Standing |
| TOTAL | | | | 18 | |

FOURTH YEAR**FIRST TRIMESTER**

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| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|---------------------------------|---------|---------|--------------|-------------------------------|
| BSBI841 | Business Ethics | 3 | 0 | 3 | COMP812 |
| BSBI842 | Business Informatics Internship | 0 | 12 | 6 | 4 th Year Standing |
| BSBI843 | BSBI Capstone Project B | 3 | 0 | 3 | BSBI833 |
| COMP841 | Cloud Computing | 3 | 0 | 3 | COMP821 |
| COMP842 | Elective 3 | 3 | 0 | 3 | 3 rd Year Standing |
| TOTAL | | | | 18 | |

ELECTIVE COURSES

MAJOR ELECTIVE 1 (Any One Course from Business Component)

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|-------------------------|---------|---------|--------------|-----------------|
| - | Business Innovation | 3 | 0 | 3 | |
| - | Strategic Management | 3 | 0 | 3 | |
| - | Supply Chain Management | 3 | 0 | 3 | |

MAJOR ELECTIVE 2 and 3 (Any Two Courses from Informatics Component)

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|--------------------------------|---------|---------|--------------|-----------------|
| - | Multimedia Development | 3 | 0 | 3 | |
| - | Open-Source Software | 3 | 0 | 3 | |
| - | Computing Trends | 3 | 0 | 3 | |
| - | Accounting Information Systems | 3 | 0 | 3 | |

14. Awards and Credits

| | |
|-----------------------------|---|
| Degree/ Certificate Awarded | Bachelor of Science in Business Informatics |
| Total Units for Degree | 180 |
| Total Trimesters Completed | 10 |

15. Admission Criteria

A. For First Year Undergraduate Applicants

Acceptance to the University depends on the following admissions requirements:

1. Completely filled out an admission application form.
2. Minimum secondary school scores 60% or its equivalent.
3. Online Placement test (Oxford Online Placement Test (OOPT)) Result (if needed)
4. Submission of all required documents stated in the Admissions Policy.

To be admitted to any undergraduate programme, the applicant must satisfy the minimum

secondary school grades or its equivalent without the need to take the remediation classes of English and Math, as shown in the following table:

| Subtest Component for Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification | | Programme |
|---|----------------------------------|----------------------|
| | | <i>BSBI</i> |
| Mathematics | Science/ Technical/General Track | At least 70% or C |
| | Commercial Track | At least 80% or B |
| | Literature and Islamic Tracks | At least 80% or B |
| Science | | 60 |
| English | | At least 80 or B |

*This is applicable to Bahraini and similarly equivalent qualification

1. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program.

| Subtest Component for Other Qualification (Indian, Pakistan, and West African) | | Programme |
|---|----------------------------------|----------------------|
| | | <i>BSBI</i> |
| Mathematics | Science/ Technical/General Track | At least 51 or C1 |
| | Commercial Track | At least 71 or B1 |
| | Literature and Islamic Tracks | At least 71 or B1 |
| Science | - | 60 |
| English | - | At least 71 or B1 |

*Note: Science component is subject to the evaluation of the Dean.

For the undergraduate applicant who did not meet the minimum required secondary school grades in

Mathematics and English or its equivalent, his/her admissions depend on the following criteria:

| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|----------------|--|----------------------------------|---|
| All Programmes | 60-79 % grade in English | Score \geq 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| BSBI | For Commercial Track: Score 50-79% in Math For Scientific, General, and technical Track: Score 50-69% in Math | N/A | Foundation Course in Math |
| | For Science score <60% | N/A | Tutorial class in general sciences |
| All Programmes | CGPA <60% for Bahraini and KSA CGPA <41% for Indian and Pakistan | N/A | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

a. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

b. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program (English Foundation).

c. IELTS/TOEFL

Applicants who submit official IELTS or TOEFL certificates issued by accredited examination centers, with a minimum score of 450 on the TOEFL (paper-based), 131 on the TOEFL (computer-based), or 5.0 on the IELTS, are exempted from taking the required English Placement Test.

In addition, applicants who obtain an IELTS score of 5.5 or higher or a TOEFL score that meets the equivalent standard may qualify for English course exemptions based on their results. This policy recognizes academic achievement by allowing eligible students to be exempted from enrolling in

introductory English courses upon admission.

| IELTS/TOEFL Scores | Exemption |
|--|---|
| Qualified applicants with 5.5 IELTS scores or TOEFL: 496 (paper-based) or 169 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 (English Communication Skills 1) |
| Qualified applicants with 6.0 IELTS scores or TOEFL: 546 (paper-based) or 211 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 and ENGL402/ENGL621 (English Communication Skills 1 and 2) |

d. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature and Islamic tracks must take the remediation course in Math.

e. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

B. For Undergraduate Transfer Student Applicants

Application Requirements:

1. Completely filled out an admission application form
2. Official Transcript of Records (TOR) from the university previously attended. Rules and regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school certificates are to be applied when necessary.
3. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
4. Certificate of Transfer from the university previously attended stamped by MOE, if any.
5. Withdrawal Certificate stamped by MOE

6. Submission of all required documents stated in the admissions policy.

Admissions Requirements:

1. For Bahrain and KSA qualifications, the applicant should have at least a secondary school average of 60%. For non-Bahrain secondary qualifications (Indian and Pakistan) the applicant should have at least 41% secondary school average; and for other non-Bahraini qualifications please refer to the table of cut-off.
2. If the applicant has taken and passed courses in English and Mathematics in the previous university, the applicant will be exempted in taking the remedial courses in both English and Mathematics. The applicant may proceed to mainstream university courses and is eligible to apply for credit transfer.
3. If the applicant has not taken any course in English and Mathematics, the basis for evaluation whether remedial course in English and mathematics is required or not is the subject scores in his/her last year in the secondary school certificate using the table presented earlier.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. Practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or re-admitted student from UTB.

The University requires the undergraduate student to complete at least 50% of the required credit units/hours of a programme in residence at UTB. The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit units/hours based on his/her original degree from another university.

16. CGPA Requirement for Graduation

The required CGPA for an undergraduate student to be eligible for graduation is 2.0 out of 4.0

17. Career Pathways

The graduates of BSBI programme can pursue a career as online marketing analyst, business analyst, software applications developer, information security analyst, computer systems analyst, database administrator, management analyst, web application developer, e-commerce developer, management consultant, project manager, quality assurance manager, video production manager or entrepreneur. In addition, the programme can lead graduates for postgraduate degrees in business such as MBA or MSc in Management Information Systems.

18. BSBI CURRICULUM SKILLS MAPPING

| Year | Course Code | Course Title | Core (C) or Option (O) | Program Intended Learning Outcomes | | | | | | | |
|--------------------------------------|-------------|--|------------------------------|------------------------------------|----|----|----|----|----|----|----|
| | | | | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
| Year 1 1st Tri | ENGL401 | English Communication Skills1 | (C) | | | | | | | √ | |
| | HIST400 | History of Bahrain and the GCC Region | (C) | | | | | | √ | | |
| | MATH401 | College Algebra | (C) | √ | √ | | √ | √ | | √ | √ |
| | SOCI400 | Sociology | (C) | | | | √ | | | | |
| | BUSI615 | Principles of Management | (C) | √ | √ | | √ | | | √ | |
| | COMP613 | Fundamentals of Information Systems | (C) | √ | √ | √ | √ | √ | √ | | |
| | EUTH400 | Euthenics 1 | (C) | | | | | | | | |
| Year 1 2nd Tri | ENGL402 | English Communication Skills 2 | (C) | | | | | | | √ | |
| | BUSI621 | Organizational Behavior | (C) | √ | √ | √ | | | | √ | √ |
| | BUSI622 | Financial Accounting 1 | (C) | √ | √ | √ | √ | √ | | | |
| | BUSI633 | Microeconomics | (C) | √ | √ | √ | √ | √ | √ | | |
| | BSBI625 | Principles of Banking and Finance | (C) | √ | √ | | √ | | | √ | |
| | COMP623 | Business Information Systems | (C) | √ | √ | √ | √ | √ | | √ | √ |
| | EUTH401 | Euthenics 2 | (C) | | | | | | | | |
| Year 1 3rd Tri | ARAB400A | Arabic Language | (C) | | | | | | | √ | |
| | ENGL403 | Speech and Oral Communication | (C) | | | | | | | √ | |
| | HUMR400 | Human Rights | (C) | | | | √ | | | | |
| | BUSI631 | Principles of Marketing | (C) | √ | | √ | | | | √ | √ |
| | BUSI632 | Human Resource Management | (C) | √ | | √ | √ | | √ | √ | √ |
| | BUSI713 | Macroeconomics | (C) | √ | √ | √ | √ | √ | √ | | |
| Year 2 1st Tri | ENGL502 | Technical Writing | (C) | | | | | | | √ | √ |
| | MATH403 | Business Statistics | (C) | | | | | | | √ | |
| | BUSI711 | Managerial Accounting 1 | (C) | √ | | √ | √ | | | | |
| | BSBI711 | Bahrain Business Environment & Cross-Cultural Management | (C) | √ | | | √ | | √ | | |
| | COMP711 | Introduction to E-Commerce | (C) | | √ | | √ | √ | √ | √ | √ |
| | COMP712 | Computer Programming 1 | (C) | √ | √ | | | | | | |
| | ENVM400 | Environmental | (C) | √ | √ | | | | √ | √ | √ |

18. BSBI CURRICULUM SKILLS MAPPING

| Year | Course Code | Course Title | Core (C) or Option (O) | Program Intended Learning Outcomes | | | | | | | |
|---------------------------|-------------|--|------------------------------|------------------------------------|----|----|----|----|----|----|----|
| | | | | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
| Year 2 2nd Tri | | Management | | | | | | | | | |
| | BUSI721 | Quantitative Methods | (C) | √ | | √ | √ | √ | | √ | |
| | BUSI712 | Mathematics of Investment | (C) | √ | | √ | √ | | | | |
| | COMP721 | Database Management Systems | (C) | √ | √ | | | | √ | | √ |
| | COMP722 | Human-Computer Interaction | (C) | √ | √ | | | | | √ | |
| | COMP723 | Computer Programming 2 | (C) | √ | √ | √ | | | √ | | |
| Year 2 3rd Tri | BSBI731 | Research Methods | (C) | √ | | √ | | √ | √ | √ | |
| | BSBI732 | Technopreneurship | (C) | √ | | √ | √ | | | √ | √ |
| | BSBI733 | Financial Management | (C) | √ | | | | √ | | √ | √ |
| | COMP731 | Systems Analysis and Design 1 | (C) | √ | √ | √ | √ | √ | √ | | √ |
| | COMP732 | IT Infrastructure | (C) | √ | √ | | | | √ | | |
| | COMP733 | Mobile Application Development | (C) | | √ | | | | √ | | |
| Year 3 1st Tri | BUSI811 | Islamic Banking and Finance 1 | (C) | √ | √ | | √ | | √ | | |
| | BSBI812 | Business Process Management | (C) | √ | √ | √ | √ | √ | √ | √ | √ |
| | BSBI813 | Bahrain Business Law and Taxation | (C) | √ | √ | | √ | √ | | √ | √ |
| | COMP811 | Systems Analysis and Design 2 | (C) | √ | √ | | √ | | √ | | |
| | COMP812 | IS Strategy, Management & Acquisition | (C) | √ | √ | | | | √ | | |
| | BSBI814 | Elective 1 | (C) | | | | | | | | |
| Year 3 2nd Tri | BSBI821 | Operations Management | (C) | √ | √ | | √ | | √ | √ | √ |
| | COMP821 | Information Management, Security and Support | (C) | √ | | √ | √ | | √ | √ | √ |
| | COMP822 | Web Design and Development | (C) | √ | √ | √ | √ | √ | √ | | |
| | COMP823 | Project Management | (C) | √ | √ | √ | √ | √ | √ | √ | √ |
| | COMP824 | Data Mining & Warehousing | (C) | √ | √ | √ | √ | √ | √ | √ | √ |
| | COMP825 | FinTech | (C) | | | √ | | √ | | √ | |
| Year | BSBI831 | Digital Marketing | (C) | √ | √ | √ | | | √ | √ | |

18. BSBI CURRICULUM SKILLS MAPPING

| Year | Course Code | Course Title | Core (C) or Option (O) | Program Intended Learning Outcomes | | | | | | | |
|--|--------------------------------|--|------------------------------|------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | | | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
| 3 3rd Tri | BSBI832 | Business Planning | (C) | √ | | √ | √ | | | √ | √ |
| | BSBI833 | BSBI Capstone Project A | (C) | √ | √ | √ | | | √ | | |
| | BUSI831 | Business Analytics | (C) | √ | √ | √ | √ | √ | √ | √ | √ |
| | COMP832 | Enterprise Systems Architecture and Applications | (C) | | √ | √ | √ | √ | | √ | √ |
| | COMP833 | Elective 2 | (C) | | | | | | | | |
| Year 4 1st Tri | BSBI841 | Business Ethics | (C) | √ | √ | √ | √ | √ | | | |
| | BSBI842 | Business Informatics Internship | (C) | √ | √ | √ | √ | √ | √ | √ | √ |
| | BSBI843 | BSBI Capstone Project B | (C) | √ | | √ | √ | √ | | | |
| | COMP841 | Cloud Computing | (C) | √ | √ | √ | | √ | √ | √ | √ |
| | COMP842 | Elective 3 | (O) | | | | | | | | |
| | Elective Title | | | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
| | Business Innovation | | (O) | √ | √ | √ | √ | | √ | √ | √ |
| | Strategic Management | | (O) | √ | | √ | √ | | √ | √ | √ |
| | Supply Chain Management | | (O) | | √ | √ | | √ | | √ | √ |
| | Multimedia Development | | (O) | | √ | √ | | √ | √ | √ | √ |
| | Open Source Software | | (O) | √ | | √ | √ | √ | | | √ |
| | Computing Trends | | (O) | √ | | √ | √ | √ | | √ | √ |
| | Accounting Information Systems | | (O) | √ | | √ | | √ | √ | | √ |

BACHELOR OF SCIENCE IN BUSINESS INFORMATICS (BSBI)
CURRICULUM PLAN EFFECTIVE AY2021-2022

COURSES DESCRIPTION**FOUNDATION COURSES**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|---------------------------|----------------|----------------|---------------------|-------------------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| This course is a foundation in mathematics focusing on the building of the knowledge and skills and understanding to solve problems in college algebra and trigonometry. It deals with the topics on equations and Inequalities; functions and graphs; polynomial and rational Functions; exponential and logarithmic functions; trigonometric functions; trigonometric identities and equations; application of trigonometry; systems of equations and inequalities; and matrices. It also includes the application of the mathematical thinking process. | | | | | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| ENGL500 is a required foundation course for entering students whose English language skills need further improvement and enhancement to be able to cope with the university's academic courses. This course introduces the students to the English language where they get involved and engaged in the learning process. It utilizes an integrated approach in developing the students' English macro communication skills in speaking, | | | | | |

listening, grammar, and vocabulary in one phase (preintermediate) which will serve as the benchmark for the next level first year English course. Furthermore, the course intensifies its intended learning objectives with the comprehensive utilization of audio-lingual presentations, includes information related to dictionary use, basic grammar rules, daily use vocabulary words through a variety of contexts, written responses, writing structures, settings of writing, and the process of forming written and spoken communications. Hence, the students are expected to gain more knowledge to communicate effectively in English.

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC HRS | LAB HRS | CREDIT UNITS | PRE-REQUISITE(S) |
|--|---------------------------------------|--------------------|--------------------|-------------------------|-------------------------|
| ENGL401 | English Communication Skills 1 | 3 | 0 | 3 | ENGL401 |
| This is an introductory course in English communication designed to provide comprehensive, up-to-date and relevant instruction in the correct use of grammar. It intends to build up students' confidence in communicating their thoughts, ideas, information and messages through the functions and structures of different words, phrases, clauses, sentences and paragraphs. In addition, the integration of language skills increases their communicative competence and prepares them for the academic and social challenges in college and beyond. | | | | | |
| HIST400 | History of Bahrain and the GCC Region | 3 | 0 | 3 | |
| This Course includes the history of the Kingdom of Bahrain and the Arabian Gulf region. It includes the important events in Bahrain and the Arabian Gulf region and their impact on the current situation. It covers the strategic importance of Bahrain, starting with "Ancient civilizations and passing through" the Islamic era, Bahrain's entry into Islam, Portuguese occupation, competition of powers in the 17th century and the rise of a tribe of Al-Atub. It includes the history of Bahrain under the British protection and the conventions between Bahrain and Great Britain up to British troops leaving the region. It describes the places and persons as well as the historical developments and achievement in Bahrain during the time of Al- Khalifah. It includes independence of Bahrain, issuing of the first constitutional law, reform project by His Majesty King Hamad, constitutional amendments, establishment of GCC, history of Arab Gulf states. It makes the student able to present his patriotic character through historical discussions. | | | | | |
| MATH401 | College Algebra | 3 | 0 | 3 | |
| This course is designed to familiarize learners with main theories, principles and concepts of college algebra that are useful in analysis and simplification of basic and some advanced mathematical problems. Content includes functions which are polynomial, rational, exponential, logarithmic and related equations. Sketching graphs, Matrices, determinants, progressions and inequalities as applied to engineering. | | | | | |
| SOCI400 | Sociology | 3 | 0 | 3 | |
| This course is designed to expose students in a detailed approach of studying society. It intends to give emphasis on the sociological perspectives, relationships with other social sciences, the main figures in sociological development, including introduction to culture, transformation of societies, importance of socialization, social groups, deviance and social control. Further, it incorporates the discussions on social institutions that enable the college students to understand the economic perspective from ancient to present, the evolution of education and the current viewpoint of family. | | | | | |
| BUSI615 | Principles of Management | 3 | 0 | 3 | |
| This is an introductory course for the study of management and the role it plays in organizations. It introduces | | | | | |

students to the ideas of managerial levels, skills, and management 'concepts. It develops their understanding about how successful employees and managers operate. The course begins with a historical overview of the management field and evolution of management thought. Additionally, the course focuses on the management process/ managerial functions such as planning, organizing, leading, and controlling.

COMP613

Fundamentals of Information
Systems

3

0

3

This course focuses on the detailed knowledge on management information systems by establishing a link between business processes and information technology. It includes the topics on decision making frameworks, types of information systems, systems development, networks, IT infrastructure and, social impacts of IT.

EUTH400

Euthenics 1

1

0

0

This course is designed to bring in the policies and procedures in the university, to guide the students in the performance of their respective role and to become adept on ideals needed in their academic pursuit. Thus, students are oriented on the history, vision, mission, values and objectives of the university, the services and academic support available, the academic and non-academic policies, the different misconduct and violations with corresponding penalties in which the learning objectives are better facilitated by various classroom discussion through collaborative team work learning experience.

TOTAL

18

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE/S |
|--------------------|--------------------------------|--------------------|--------------------|-------------------------|-----------------------|
| ENGL402 | English Communication Skills 2 | 3 | 0 | 3 | ENGL401 |

This is an intermediate course in English communication geared towards equipping the college students with writing skills in preparation for academic writing. It progresses from familiarizing the sentence conventions to balancing the structures of the sentence for variation and rhythm. Further, it enables students to follow the principles that govern the composition writing in achieving unity, coherence and emphasis; to improve their expository, descriptive, narrative and argumentative works and to get hold of the discipline in academic writing for future advantages by providing them the opportunity in adhering the process of writing for effective communication

BUSI621

Organizational Behavior

3

0

3

The course deals with a comprehensive analysis of human behavior at both individual and organizational levels. Topics include personality and attitudes, perception and attribution, motivation, communication, work stress, group and team dynamics, leadership, decision making, quality, ethics, job and organization design, conflict management, organizational culture and politics, and organizational change.

BUSI622

Financial Accounting 1

2

2

3

This course provides students with an overview of fundamental financial accounting concepts with a focus on learning the accounting cycle from different forms of organization. Through a primary review of accounting transactions, integrated real-world examples, and a variety of practice opportunities, the course emphasis on the application of accounting principles and techniques in practice.

BUSI633

Microeconomics

3

0

3

This course introduces students to the economic analysis of decision-making, how markets work, and how consumers and firms make their decisions. The course focuses on the application of economic reasoning to a range of problems relevant for understanding the mechanisms and institutions that allocate and distribute

resources. It covers rational decisions; demand and supply; the market mechanism; elasticity, efficiency, and equity.

| | | | | | |
|---------|-----------------------------------|---|---|---|--|
| BSBI625 | Principles of Banking and Finance | 3 | 0 | 3 | |
|---------|-----------------------------------|---|---|---|--|

The course deals with both the theoretical and practical concerns related to today's financial system. It covers money and the financial system, the payment system, financial instruments, and financial institutions. The course enables the students to demonstrate in depth knowledge and understanding of the structure and operations of commercial banks, central banking and the operation of monetary policy, non-banking institutions, the structure of financial markets, and elements of monetary policy.

| | | | | | |
|---------|------------------------------|---|---|---|--|
| COMP623 | Business Information Systems | 2 | 2 | 3 | |
|---------|------------------------------|---|---|---|--|

This course covers the basic and advanced concepts of information technology, its tools, and applications. It includes MS Office package that is used for daily tasks to improve decision making and productivity. The course enables students to demonstrate high level of proficiency in word processing, spreadsheets, PowerPoint presentation, electronic mail, and internet browsing. Students also analyze and evaluate the internet's impact on the use of IS in organizations.

| | | | | | |
|---------|-------------|---|---|---|---------|
| EUTH401 | Euthenics 2 | 1 | 0 | 0 | EUTH400 |
|---------|-------------|---|---|---|---------|

This course is designed to provide the discussion on the students' rules and regulations of the university in order to practice the right conduct of behavior inside and outside the university premises. It intends to teach the students on the different stages of personality development, the equivalent penalties in different academic offences and factors that influence behavioral multiple intelligences. Further, the incorporation of oral/written communication through individual and group discussions can encourage learners to ponder on the meaning of life and discover the purpose of their existence.

TOTAL

18

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|-----------------|---------|---------|--------------|-----------------|
| ARAB400 | Arabic Language | 3 | 0 | 3 | |

The course focuses on the fundamentals of Arabic language, such as reading, analyzing, and critique. It explains the characteristics of the required texts, which deal with different literary genres, prose and poetry. The course also focuses on the understanding and application of grammatical rules and basic morphological methods in Arabic, taking into account the correct spelling skills.

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|---------|-------------------------------|---|---|---|---------|
| ENGL403 | Speech and Oral Communication | 3 | 0 | 3 | ENGL402 |
|---------|-------------------------------|---|---|---|---------|

This is a developmental course in English communication geared towards competent, efficient and effective interpersonal speaking across communicative contexts. It refines oral communication skills through accurate articulation of segmental phonemes, pronunciation drills and enunciation of the suprasegmental features of speech, specifically sentential stress and intonation. Further, it incorporates the mechanics and techniques of speech craft and delivery with emphases on practical speaking experiences and analysis of audience psychology, which are deemed applicable in diverse speech situations.

| | | | | | |
|---------|--------------|---|---|---|---------|
| HUMR400 | Human Rights | 3 | 0 | 3 | SOCI400 |
|---------|--------------|---|---|---|---------|

This course makes the students able to know the background, main concepts of Human Rights and the philosophical thoughts and Islamic view which contribute in modern Human Rights. It makes them able to analyze what is mentioned in different kinds of Human Rights sources as Universal Declaration of Human Rights, International Covenant on Civil and Political Rights and International Covenant on Economic, Social

and Cultural Rights. It deals in the same approach with the National Sources of Human Rights such as the Constitutional Law of Kingdom of Bahrain and National Action Charter with applications as well. The course makes the students able to analyze, discuss and debate Human Rights issues in different ways.

| | | | | | |
|---------|-------------------------|---|---|---|---------|
| BUSI631 | Principles of Marketing | 3 | 0 | 3 | BUSI631 |
|---------|-------------------------|---|---|---|---------|

This course focuses on the essentials of marketing, its nature and its scope that are crucially important to the organization's success in a dynamic environment. The course provides a broad background on the marketing concept, the role of marketing both within the organization and within the external environment, the marketing mix, (product, place, promotion, and price), market segmentation, targeting and positioning, consumer, and business behavior.

| | | | | | |
|---------|---------------------------|---|---|---|---------|
| BUSI632 | Human Resource Management | 3 | 0 | 3 | BUSI621 |
|---------|---------------------------|---|---|---|---------|

This course is an introductory course for Human Resource Management (HRM); it is designed to cover the major topics and issues related to HRM, which will help the student understand and analyze the role that HRM plays in formulating and implementing organizational strategy and in achieving overall organizational efficiency and effectiveness. The course exposes students to HRM concepts, objectives, and functions. It also looks at diverse challenges that face HRM in its environment. Additionally, the course focuses on the scope of HRM in terms of job analysis, Human resources planning and recruiting, selection, training, and performance evaluation and appraisal.

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|---------|----------------|---|---|---|---------|
| BUSI713 | Macroeconomics | 3 | 0 | 3 | BUSI633 |
|---------|----------------|---|---|---|---------|

The primary focus of this course is twofold: (1) understanding the core macroeconomic concepts of growth, inflation, and unemployment – and how they are interrelated and (2) understanding how fiscal and monetary policy at both the national and international level influences these concepts. This course also covers concepts such as GDP, inflation, unemployment, usage of monetary and fiscal policies, in real world setting.

TOTAL**18****SECOND YEAR****FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|-------------------|---------|---------|--------------|-----------------|
| ENGL502 | Technical Writing | 3 | 0 | 3 | ENGL403 |

This is an advanced course in English academic writing designed to deal with the application of the technical writing principles with the correspondence on business, science, and technology. It aims to develop the technical writing skills and communication of the college students thru the discussions of its elements and ethics with the use of digital technologies. Furthermore, it enables students to adapt the various communication routes in the workplace, to conceptualize suitable contents of technical writing, to understand the characteristics and other methods of communication techniques, to plan and organize advanced level tasks and to work effectively and with accountability with other team members in a creative and productive manner, in any language learning scenario when achieving personal and group outcomes.

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|---------|---------------------|---|---|---|---------|
| MATH403 | Business Statistics | 3 | 0 | 3 | MATH401 |
|---------|---------------------|---|---|---|---------|

The course deals with the study of the fundamental concepts and principles in statistics and its application to business. It covers concepts on collecting, organizing and presenting data, numerical descriptive measures. It also identify the theorem of probability, probability distributions and link it with real life problems, it also covers inferential measures and how we interpret the data for decision making.

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|---------|-------------------------|---|---|---|---------|
| BUSI711 | Managerial Accounting 1 | 3 | 0 | 3 | BUSI622 |
|---------|-------------------------|---|---|---|---------|

This course covers the use of accounting information for internal planning, analysis, and decision-making with a

focus on information generated by internal accounting systems. It focuses on equipping students with the knowledge to prepare, understand, evaluate, and act upon the many financial and non-financial reports used in managing modern firms. Such information is a key input into a wide range of analytical tools to support decisions: analyzing the profitability of various products, managing product-line portfolios, setting prices, measuring and managing the profitability of customers, making operational and strategic decisions, evaluating investments, and investigating efficiency.

| | | | | | |
|---------|--|---|---|---|--|
| BSBI711 | Bahrain Business Environment & Cross-Cultural Management | 3 | 0 | 3 | |
|---------|--|---|---|---|--|

This course exposes the student to the business environment in the Kingdom of Bahrain. It covers public sector regulations and policies as well as the role of Central Bank of Bahrain in adjusting the national economy beside the contribution of Tamkeen and Labour Market Regulatory Authority to small and medium enterprises as part of Bahrain vision 2030.

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|---------|----------------------------|---|---|---|---------|
| COMP711 | Introduction to E-Commerce | 3 | 0 | 3 | COMP613 |
|---------|----------------------------|---|---|---|---------|

This course covers the electronic commerce elements, types, models, development process, applications, services, and technologies which are used to conduct business on the World Wide Web. It focuses on the three major driving forces that permeate all aspects of e-commerce: business development and strategy, technological innovations, and the social and legal issues and impacts. It also deals with the advantages and challenges related to integrating e-commerce applications to business

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|---------|-----------------------|---|---|---|---------|
| COMP712 | Computer Programming1 | 2 | 2 | 3 | COMP613 |
|---------|-----------------------|---|---|---|---------|

This course covers detailed knowledge in problem solving and algorithm development, with emphases on developing good programming habits, and programming in a modern computer language. The course familiarizes the students with the features of object-oriented programming and its applications to solve the problems. It includes a discussion of an overview of the Java language syntax, including packages, classes, methods, variables, conditional statements, control flow and Arrays. The laboratory focuses on the implementation of the programming theories and concepts in Java programming language.

| | |
|--------------|-----------|
| TOTAL | 18 |
|--------------|-----------|

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|---------------------------|---------|---------|--------------|-----------------|
| ENVM400 | Environmental Management | 3 | 0 | 3 | |
| This course examines the environmental management of natural resources, basic scientific principles, energy flow, population and food security, conventional and renewable energy, water issues, pollution and its relationship to human health, climate impact, waste management and hazardous materials, cost benefit analysis applied to environmental issues, management of resource, sustainable best practice and environmental laws and policies are discussed. | | | | | |
| BUSI721 | Quantitative Methods | 3 | 0 | 3 | MATH403 |
| This course provides an introduction to the concepts and applications of quantitative methods in management. It develops mathematical and statistical competences necessary to facilitate progression in courses such as Operations Management. This course builds on the concepts and analytical tools taught in Principle of Statistics. This course focuses on developing quantitative methods, such as, linear programming, sensitivity and duality theory, transportation and assignment problems, network, and queuing theory in addition to waiting line, game theory and simulation. | | | | | |
| BUSI712 | Mathematics of Investment | 3 | 0 | 3 | MATH401 |

The course is a mathematical treatment of the methods used in understanding concepts, mathematical problems and solutions concerning money transaction associated with interest and time. It integrates practical and theoretical aspects of finance and investments essential for the success of all business disciplines. It also covers the theories and applications of simple and compound interest, annuity, stock, and bonds.

| | | | | | |
|---------|-----------------------------|---|---|---|---------|
| COMP721 | Database Management Systems | 2 | 2 | 3 | COMP712 |
|---------|-----------------------------|---|---|---|---------|

This course provides advanced core theories and practical skills in databases and database management systems with information technology applications. The theoretical knowledge covers Database Environment, Relational Model, Database Operations, Structured Query Language, Entity Relationship Model and Normalization. It exposes the student to the advanced concepts and techniques in database development as well as providing a foundation for research in databases. The laboratory practices the Data Definition Language (DDL) Commands, Data Manipulation Language (DML) Commands, Data Query Language (DQL) Commands, Transaction Control Language (TCL) Commands, SQL Built-in Functions, Constraints, Joins, GroupBy Command, Subqueries and Database Objects using Oracle SQL Developer tool.

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|---------|----------------------------|---|---|---|---------|
| COMP722 | Human-Computer Interaction | 3 | 0 | 3 | COMP711 |
|---------|----------------------------|---|---|---|---------|

The course provides detailed knowledge to the field of human-computer interaction (HCI), an interdisciplinary field that integrates cognitive psychology, design, computer science, and others. Examining the human factors associated with information systems provides the students with the knowledge to understand what influences usability and acceptance of IS. The course examines human performance, components of technology, methods, and techniques used in the design and evaluation of IS. Societal impacts of HCI such as accessibility are also discussed. User-centered design methods are introduced and evaluated. This course also introduces students to the contemporary technologies used in empirical evaluation methods.

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|---------|------------------------|---|---|---|---------|
| COMP723 | Computer Programming 2 | 2 | 2 | 3 | COMP712 |
|---------|------------------------|---|---|---|---------|

This course covers object-oriented techniques using modern fourth generation language. Topics include inheritance, method overloading, overriding, polymorphism, packages, exception handling, multithreading, file operations and Event driven programming using swing components. The laboratory focuses on the implementation of the programming theories and concepts in Java programming language.

TOTAL

18

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|------------------|---------|---------|--------------|-----------------|
| BSBI731 | Research Methods | 3 | 0 | 3 | MATH403 |

The course studies the scope and significance of business research. It introduces students to the various aspects of business research, its types, tools, and methods, and students will learn how to apply business research techniques to real-world situations. The course covers topics such as the identification of a topic by the student, proposition of hypothesis, formulation of research questions, development of literature review, select research design and methodologies. Additionally, students will learn data collection techniques, primary and secondary data with application to specific problems, scaling and research instrument design, and sampling design.

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|---------|-------------------|---|---|---|---------|
| BSBI732 | Technopreneurship | 3 | 0 | 3 | BUSI631 |
|---------|-------------------|---|---|---|---------|

This course provides advanced concepts, facts and ideas of starting a business, working for an entrepreneurial company or working with entrepreneurial firms as an investor or advisor. The course is designed to demonstrate necessary techniques and tools to planning and organizing business and is aimed to integrate the overall dimensions of entrepreneurship, including identifying a winning business opportunity, gathering funding for and launching a business, growing the organization and harvesting the rewards. In particular topics

covered different types of entrepreneurship, its importance for economies, business model creation, financial evaluation and financing the start-up.

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|---------|----------------------|---|---|---|---------|
| BSBI733 | Financial Management | 3 | 0 | 3 | BSBI625 |
|---------|----------------------|---|---|---|---------|

This course explores the core theories, concepts, and principles of financial management used in managerial decisions. The course focuses on the analysis and application of a range of tools and techniques such as time value of money, financial statement analysis, security valuation, working capital management, and capital budgeting in obtaining and organizing relevant financial information to solve some significant current issues in management.

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|---------|-------------------------------|---|---|---|---------|
| COMP731 | Systems Analysis and Design 1 | 2 | 2 | 3 | COMP721 |
|---------|-------------------------------|---|---|---|---------|

This course covers theory and practice of systems analysis and design, business requirements determination, organizational processes documentation, information flow analysis, and information systems reengineering/design. It focuses on the front-end of the system development life cycle (SDLC) by carefully examining some of the methodologies, approaches, methods, techniques, procedures, tools, and data and information used by systems analysts in the analysis and design of organizational information systems.

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|---------|-------------------|---|---|---|---------|
| COMP732 | IT Infrastructure | 3 | 0 | 3 | COMP711 |
|---------|-------------------|---|---|---|---------|

This course provides details of the advanced knowledge of information technology recognized as a critical area in infrastructure management and IT issues. The course apply researches related to the security concepts as well as the new methods used to solve the problem faced by implementing new technology to enhance the data center and reduce risks that might be caused in the organization. It covers topics related to both computer systems architecture and communications network, with an over-all focus on the advanced knowledge of services and capabilities that IT Infrastructure solutions in an organizational context. Students will examine the concepts, models, architectures, protocols, and standards related to the development of an integrated technical architecture (hardware, platforms, software, networks, and data) to serve organizational needs in a rapidly changing competitive and technological environment. It likewise prepares the students for organizational roles that require interaction with external vendors of IT infrastructure component and solutions.

| | | | | | |
|---------|--------------------------------|---|---|---|---------|
| COMP733 | Mobile Application Development | 2 | 2 | 3 | COMP723 |
|---------|--------------------------------|---|---|---|---------|

This course provides a systematic explanation of advanced concepts in mobile programming and provide an in depth coverage of mobile systems and it application development. It includes the mobile user interface, application development standards and the mobile technology. Moreover, it covers various mobile computing applications using common paradigms in mobile application frameworks and development environments. The Lab component of the course includes developing apps based on UI widgets, custom views and layouts, notification, toast, menus, dialog, list and data storage using Java and XML in Android Studio.

TOTAL**18****THIRD YEAR****FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|-------------------------------|------------|------------|-----------------|-----------------|
| BUSI811 | Islamic Banking and Finance 1 | 3 | 0 | 3 | BSBI733 |

This course introduces students with economic rationale of Islamic values in Islamic financial System. It covers topics on the core principles and basic models of Islamic finance and Establishes a framework for understanding this financial system. It examines how and why Islamic values determine the business climate. It provides a clear framework for analysing the micro- and macro-economic foundations of the Islamic system.

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|--|---|---|---|-----------|-------------------|
| BSBI812 | Business Process Management | 2 | 2 | 3 | COMP721 |
| This course introduces the process-oriented view of the flows of materials, information, products, and services through and across organizational functions. It focuses on the understanding, analyzing, designing, and documenting business processes, and continuously assessing the efficiency and effectiveness of these processes to minimize cost and maximize value creation. Students will learn how to identify information-bearing events, assess, and improve process efficiency, learn to model, and analyze business processes using BPMN applications and related tools, and understand the interactions between human behavior and process design | | | | | |
| BSBI813 | Bahrain Business Law and Taxation | 3 | 0 | 3 | BSBI711 |
| This course covers the legal environment of international business and contracting, international and U.S. trade laws and treaties, regulation of the international marketplace, legal theories, ethical issues, and regulatory climate affecting business policies and decisions. Topics include the classification and sources of law; contracts and functions of contracts; and forms of negotiable instruments | | | | | |
| COMP811 | Systems Analysis and Design 2 | 2 | 2 | 3 | COMP731 |
| This course is the continuation of Systems Analysis and Design 1 and covers the theory, fundamental concepts, and practical uses of software analysis and design methodologies and tools. It focuses on the object-oriented development approach, methodologies, and modelling tools, along with project management, information system planning, database design and implementation, user interface design, system implementation and maintenance, and systems security and audit. It deals with laboratory applications for designing operational projects for real-world problems. | | | | | |
| COMP812 | IS Strategy, Acquisition and Management | 3 | 0 | 3 | COMP732 |
| This course covers the examination of the acquisition, development, and implementation of plans and policies from a management perspective. It focuses on the evaluation of IS infrastructure and systems management that support the operational and strategic requirements of the organization, as well as the creation of framework that enables organizational leaders to evaluate current information systems (IS) infrastructures, emerging technologies, and how these technologies impact organizational strategy. | | | | | |
| BSBI814 | Elective 1 | 3 | 0 | 3 | 3rd Year Standing |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|---|--------------------|--------------------|-------------------------|------------------------|
| BSBI821 | Operations Management | 3 | 0 | 3 | BUSI721 |
| The course provides the knowledge and understanding of the efficient management of the different areas of operations as well as its processes, techniques and business practices to create the highest level of efficiency. In addition to this, the course covers the 5M's of production to include man, machine, materials, methods and money and how these factors contribute to improving productivity and quality performance in both manufacturing and service operation to retain global competitiveness and achieve customer satisfaction. | | | | | |
| COMP821 | Information Management, Security, and Support | 3 | 0 | 3 | COMP732 |

This course deals with the critical understanding, application, analysis and evaluation of managing information security and its principles, compliance to laws and ethical standards, governance and security strategic planning, and security policies. It concentrates on advance conditions and situations of measures to ensure confidentiality, availability and integrity of information systems. Further, it focuses on managing risks and threats, and recommends hardware, software, and network security measures and relevant solutions to secure organizational information resources. The course also deals with the new security concepts, models, methods, and mechanisms to maintain, protect, plan and implement contingencies and disaster recovery programs to solve security-related problems.

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|---------|----------------------------|---|---|---|---------|
| COMP822 | Web Design and Development | 2 | 2 | 3 | COMP731 |
|---------|----------------------------|---|---|---|---------|

This course is an overview of the modern Web technologies used for Web Development focusing on the technologies, protocols and architectures of the Internet. The topics include History of the Web, Hypertext Markup Language (HTML), Extensible HTML (XHTML), Cascading Style Sheets (CSS), and JavaScript, technology used in web services (WSDL, SOAP, UDDI). In the lab, students are taught in practice how to design web applications using HTML, XHTML, CSS, JavaScript and web services.

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|---------|--------------------|---|---|---|---------|
| COMP823 | Project Management | 2 | 2 | 3 | COMP812 |
|---------|--------------------|---|---|---|---------|

This course covers the advanced processes, methods, techniques and tools that organizations use to manage projects. It focuses on a systematic methodology for initiating, planning, executing, controlling and closing project. Drawing that project management in the modern organization is a complex-based activity, where various types of technologies are an inherent part of the project management process. It also acknowledges that project management involves both the use of resources from within the firm, as well as contracted from outside the organization.

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|---------|---------------------------|---|---|---|---------|
| COMP824 | Data Mining & Warehousing | 2 | 2 | 3 | COMP721 |
|---------|---------------------------|---|---|---|---------|

This course focuses on wide spectrum of industry standard techniques using widely available database and tools packages for knowledge discovery. Data mining is for relatively unstructured data for which more sophisticated techniques are needed. The course aims to cover powerful data mining techniques including clustering, association rules, and classification. It then teaches high volume data processing mechanisms by building warehouse schemas such as snowflake, and star. Online Analytical Processing (OLAP) query retrieval techniques are also introduced.

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|---------|---------|---|---|---|---------|
| COMP825 | FinTech | 3 | 0 | 3 | BSBI733 |
|---------|---------|---|---|---|---------|

This subject provides an introduction to the emerging field of Financial Technology (FinTech). It covers the fundamentals of Blockchain technology and its applications in the realms of Finance and Business. The course delves into the transformative impact of financial technologies on various stakeholders, including financial institutions, businesses, banks, and regulatory entities. Additionally, students will gain insights into alternative sources of funding for entrepreneurial ventures, such as crowdfunding and peer-to-peer lending. The overarching goal of this module is to furnish students with the knowledge and analytical skills necessary for assessing the challenges and opportunities stemming from the rapid proliferation of FinTech. Moreover, it aims to elucidate the primary categories of FinTech and their influence on financial institutions and regulatory frameworks. A key objective of this module is to present Financial Technology in an accessible manner, replete with numerous case studies and illustrative examples.

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| TOTAL | 18 |
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THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|--------------|------------|------------|-----------------|-----------------|
|-------------|--------------|------------|------------|-----------------|-----------------|

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|---|---|---|---|-----------|-------------------------------|
| BSBI831 | Digital Marketing | 3 | 0 | 3 | COMP711 |
| This course explores digital marketing as a subset of a larger set of concepts and theories within the marketing discipline. Marketers make considerable use of interactive digital technologies: the Internet, interactive TV, SMS communications, electronic kiosks, etc. They do so to achieve a variety of goals: market intelligence provision, developing new business models, building customer profiles, direct and interactive communications, placing goods with customers through virtual stores, and working with customers to develop innovative new products and services. These activities present management with exciting opportunities, reveal new sources of competition and also demand a re-evaluation of core competencies. Topics in the course include digital business models and digital marketing plan, web analytics, online consumer behaviors, driving web traffic and performance metrics, conversion optimization, building a personal brand online, using analytics and data in digital marketing. | | | | | |
| BSBI832 | Business Planning | 3 | 0 | 3 | COMP823 |
| This course covers business opportunities and entrepreneurial goals in terms of funding acquisition for new business venture from idea generation through business planning, funding and startup. It focuses on guiding the students in making key decisions with the aid of business analysis tools for understanding competitive/market dynamics, developing market-entry strategy, financial tools for estimating economic viability, criteria for making decisions to start new ventures. | | | | | |
| BSBI833 | BSBI Capstone Project A | 3 | 0 | 3 | COMPLETED 144 Units |
| This course integrates and applies theoretical knowledge acquired during the course of the program to a project involving systems documentation and development. The processes start from problem definition to documentation. Moreover, the course requires project proposal, systems planning and design utilizing various methods and their practical application to business and information technology, particularly in IS development. | | | | | |
| BUSI831 | Business Analytics | 2 | 2 | 3 | BUSI721, COMP824 |
| This course provides students with the essential concepts and tools needed to understand the emerging role of business analytics in organizations. The course covers understanding, application, analysis, and evaluation of descriptive, predictive, and prescriptive data mining and analytical approaches, methods, techniques, and tools placed and practiced in a spreadsheet environment and other useful applications to develop significant insights for effective business decision making. | | | | | |
| COMP832 | Enterprise Systems Management and Applications | 2 | 2 | 3 | BSBI812 |
| The course introduces the theoretical and practical areas of Enterprise Systems (ES) such as Enterprise Resource Planning (ERP) and its strategic role in helping organizations improve their capabilities, operations, and processes. It focuses on systems integration, ES architecture, the development lifecycle, ERP implementation strategies, software, and vendor selection, its operational and post implementation, and program and project management. The course presents the evolution, components and architecture of Enterprise Systems including the benefits and drawbacks of implementing Enterprise Systems and how they can assist organizations to improve their overall efficiency. | | | | | |
| COMP833 | Elective 2 | 2 | 2 | 3 | 3 rd Year Standing |
| TOTAL | | | | 18 | |

FOURTH YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|--------------|------------|------------|-----------------|-----------------|
|-------------|--------------|------------|------------|-----------------|-----------------|

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|--|---------------------------------|---|---|-----------|-------------------------------|
| BSBI841 | Business Ethics | 3 | 0 | 3 | COMP812 |
| This course deals with the importance of ethics and its role in the business and in the information technology (IT) arena. Ethical dilemmas and decision-making approaches confronting all Business Organization' Stakeholders such as leaders, managers, employees, customers and the public are explored at the societal, organizational and personal levels as well as from an IT perspective. | | | | | |
| BSBI842 | Business Informatics Internship | 0 | 1 | 6 | 4 th Year Standing |
| Internship (Practicum) requires the students to draw upon multi-disciplinary knowledge and skills acquired from their previous courses. Internship enhances student's skills to an advanced level allowing them to pursue career as professional employees in leadership positions. In this course, the students undertake a significant experiential learning opportunity that makes them acquire knowledge in an applied work setting. The course represents an educational strategy that links classroom learning and with the actual work environment where the students undertake 240 hours of training in the companies under the guidance of the practicum adviser. | | | | | |
| BSBI843 | BSBI Capstone Project B | 3 | 0 | 3 | BSBI833 |
| This course enables students to continue the first part of the Capstone Project to develop and implement the project using suitable system development tools and methodologies. The focus of the documentation is on the application of process models, project management, risk management, and concluding parts of the project – summary, conclusion and recommendations. The course requires submission of project documentation and successful project oral defense. | | | | | |
| COMP841 | Cloud Computing | 3 | 0 | 3 | COMP821 |
| This course introduces students to the knowledge of cloud computing including application scenarios, modes, trends, and its benefits; networking and storage technologies related to virtualization and cloud Fusion Access. This course will prepare students to take the Associate and Professional Cloud Computing certification examinations. | | | | | |
| COMP842 | Elective 3 | 3 | 0 | 3 | 3 rd Year Standing |
| TOTAL | | | | 18 | |

ELECTVE COURSES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|----------------------|------------|------------|-----------------|-----------------|
| ELECTIVE 1 | Business Innovation | 3 | 0 | 3 | |
| This course describes how business innovation serves as a fundamental driver of competitiveness for firms in a wide variety of business sectors. It also aims to introduce to students the concepts, theories and strategies that create and deliver value for firms through innovation network, research and development, innovation in products, services, operations, and the commercialization process, with emphasis on the complexities and risks associated with managing innovations. The course further aims to equip the students with the necessary knowledge, skills and attitude to apply strategies and tactics in managing various types of business innovations. | | | | | |
| ELECTIVE 1 | Strategic Management | 3 | 0 | 3 | |
| The course focuses on advanced corporate and divisional policy formulation and implementation. The knowledge and techniques learned in earlier courses will be applied in an integrated fashion to the process of strategic decision-making and organizational change. Among the topics considered in the course will be the relationships of organizations to their environments, the hierarchy of organizational objectives, structured as well as informal approaches to strategic planning, the integration of business functions, organizational | | | | | |

structure, and policy implementation and evaluation.

| | | | | | |
|------------|-------------------------|---|---|---|--|
| ELECTIVE 1 | Supply Chain Management | 3 | 0 | 3 | |
|------------|-------------------------|---|---|---|--|

The course covers an end-to-end perspective of managing global supply chains through the introduction of the functional areas of supply chain management. Students will be exposed to functional business processes while gaining a perspective of how functional business processes must be integrated to achieve supply chain objectives.

| | | | | | |
|--------------|------------------------|---|---|---|--|
| ELECTIVE 2,3 | Multimedia Development | 2 | 2 | 3 | |
|--------------|------------------------|---|---|---|--|

This course explores strategies for creating and integrating multimedia in business. Using equipment and Windows-based software common on many computers; students will apply these tools to web development projects and contents will include copyright/ fair use, image editing, photo editing, audio recording, movie recording, PowerPoint, and Webpage publishing.

| | | | | | |
|--------------|----------------------|---|---|---|--|
| ELECTIVE 2,3 | Open-Source Software | 2 | 2 | 3 | |
|--------------|----------------------|---|---|---|--|

This course examines the issues associated with open source technologies, with a focus on understanding the implications for businesses that are interested in using them. Through a combination of readings, presentations, discussion and hands-on projects, we will examine the characteristics of key open source technologies (Linux, MySQL, Apache, et al), the nature of open source communities, their development processes, and the evolving structure of the open source industry.

| | | | | | |
|--------------|------------------|---|---|---|--|
| ELECTIVE 2,3 | Computing Trends | 2 | 2 | 3 | |
|--------------|------------------|---|---|---|--|

This course covers Topics which include current or new trends in computing and disruptive technologies in IT (Information Technology) including professional issues, and emerging trends and current topics in business informatics research. Emphasis is given to the way technologies create a competitive edge and generate business value. An example of this is the most-related current computing trend like Internet of Things (IoT) which provides advanced data collection, connectivity, and analysis for machines, connecting everything together for a better future. Other topics include but not limited to block chain technology, nanotechnology, and Artificial Intelligence.

| | | | | | |
|--------------|--------------------------------|---|---|---|--|
| ELECTIVE 2,3 | Accounting Information Systems | 2 | 2 | 3 | |
|--------------|--------------------------------|---|---|---|--|

This course examines the design, operations, risks, and controls of accounting information systems. Emphasis is placed on financial transaction cycles and core business processes, with focus on the risks and controls involved in the processing of financial transactions in a computerized environment. This also considers current issues on accounting information systems that have ethical considerations and practical applications.

| | |
|---|---|
| 1. Teaching Institution | University of Technology Bahrain (UTB) |
| 2. University Department | College of Administrative and Financial Sciences |
| 3. Programme Title | Bachelor of Science in International Business (BSIB) |
| 4. Title of Final Award | Bachelor of Science in International Business (BSIB) |
| 5. Mode of Attendance | Actual classroom learning-interactive (Full-time) |
| 6. Delivery Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | NQF Level 8 540 NQF Credits (180 ACS Credits) |
| 8. Accreditation | European Council for Business Education Standards (ECBE) |
| 9. Other external influences | Local External Influences/References <ul style="list-style-type: none"> Ministry of Education (MOE) Higher Education Council (HEC) Education and Training Quality Authority (BQA) International External Influences/References <ul style="list-style-type: none"> QAA-UK Subject Benchmark Statement for General Business and Management 2019 Association to Advance Collegiate Schools for Business (AACSB) |
| 10. Date of production/revision of this specification | September 2021 |
| 11. Aims of the Programme | |
| <p>The Bachelor of Science in International Business (BSIB) Programme provides knowledge and skills required to manage international and global business affairs. The programme is intended to develop students with skills and competencies necessary to understand the dynamics of international and global dimension of management and strategy, trade and markets, finance, and emerging economies. The Programme also endeavors to prepare the students to obtain potential leading to management positions and provides a launch pad for global careers.</p> <p>Graduates of the programme three (3) to five (5) years after graduation shall be able to:</p> <ol style="list-style-type: none"> Possess the relevant knowledge, skills, and entrepreneurial mindset to respond proactively and creatively to contemporary business issues and challenges of global business environment. Engage and succeed in international business careers through a range of intellectual, professional attributes and transferable skills such as commercial acumen, research, teamwork, ethical behavior, proactive involvement, and effective communication. <p>Transfigure knowledge, understanding and academic skills through postgraduate study and/or continuing professional development.</p> | |
| 12. Learning Outcomes, Teaching, Learning and Assessment Methods | |

1. Demonstrate critical knowledge and understanding of the characteristics, functions, processes of business organizations, management of risks, and economies in the global contexts.
2. Critically relate and adapt business related theories, models, concepts, and approaches to address complex business problems and changing nature of business at national and global level.
3. Use a broad range of approaches to provide in-depth business solutions related to domestic and international business operations and strategy, cross culture management, public policy domains and ethical standards.
4. Critically analyze and evaluate the contemporary organizations, their practices, and the major business issues to make and communicate effective decisions.
5. Formulate creative business solutions to business problems or opportunities using latest thinking, theories, and frameworks in best business practices.
6. Use technology, investigative methods, quantitative skills, analytical tools, and specialized application in a manner that contributes to the effective management and execution of range of tasks.
7. Communicate using appropriate style and presentation about the specialized topics related to international business for the intended audience.

Manage and lead diverse groups in developing solutions to complex problems and issues.

Teaching and Learning Methods

8. Demonstrate critical knowledge and understanding of the characteristics, functions, processes of business organizations, management of risks, and economies in the global contexts.
 9. Critically relate and adapt business related theories, models, concepts, and approaches to address complex business problems and changing nature of business at national and global level.
 10. Use a broad range of approaches to provide in-depth business solutions related to domestic and international business operations and strategy, cross culture management, public policy domains and ethical standards.
 11. Critically analyze and evaluate the contemporary organizations, their practices, and the major business issues to make and communicate effective decisions.
 12. Formulate creative business solutions to business problems or opportunities using latest thinking, theories, and frameworks in best business practices.
 13. Use technology, investigative methods, quantitative skills, analytical tools, and specialized application in a manner that contributes to the effective management and execution of range of tasks.
 14. Communicate using appropriate style and presentation about the specialized topics related to international business for the intended audience.
 15. Manage and lead diverse groups in developing solutions to complex problems and issues.
5. Constructive Method. Learners must be fully engaged and active in the process of constructing meaning and knowledge based on their prior knowledge and experiences through the process of doing, making, writing, designing, creating, and solving. It allows teachers to implement differentiated learning, authentic assessment practices and incorporate technologies to improve individual learning experiences. It includes simulations, in-course projects, field trips, digital content, group discussions and reflections. This method strives to improve achievement by consciously developing learners' ability to consider ideas, analyze perspectives, solve problems, and make decisions on their own thereby making them more responsible

and independent.

6. Inquiry based Method. Learners develop cognitive skills like critical thinking and problem solving by working on questions, problems, or scenarios and formulate creative solutions. The teachers use either structured, guided, or open inquiry to facilitate learning. As a process, learners are involved in their learning by formulating questions, investigating, building their understanding, and creating meaning and new knowledge on a certain lesson. Typical activities include laboratory sessions and research-based activities.
7. Collaborative Method. Learners are divided into small groups to learn something together and capitalize on one's other resources and skills, evaluating one another ideas, and monitoring one another's work. It allows students to actively interact by sharing experiences and take on different roles. Typically, students are provided with problems or projects that they work on together to search for understanding, meaning, or solutions and each group is expected to work together developing or formulating solutions and present the solution in class. The activities include think-pair-share, jigsaw, or round-robin which effectively engage students to complete the tasks.
8. Experiential learning method is the process of learning by doing. By engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. This may include team challenges, simulations, company visits/fieldworks and other extracurricular activities. Experiential learning opportunities exist in a variety of course- and non-course-based forms and may include community service, service-learning, undergraduate research, study abroad, and culminating experiences such as internships, student teaching, and capstone projects

Assessment Methods

Assessment is done independently for each course. A variety of assessment tools will be used to assess the achievement of intended learning outcomes including but not limited to exams, assignments, projects, case analysis and presentations. In addition, assessments of learning outcome also include thesis writing, internship, and indirect assessment

13. Programme Structure

BACHELOR OF SCIENCE IN INTERNATIONAL BUSINESS (BSIB)
CURRICULUM PLAN EFFECTIVE AY2021-2022

FOUNDATION CLASSES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|----------------------|------------|------------|-----------------|----------------|
| ENGL500 | English Foundation | 12 | 0 | 0 | |
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|----------------|-------------------------------------|------------|------------|-----------------|-----------------|
| ENGL401 | English Communication Skills 1 | 3 | 0 | 3 | |
| MATH401 | College Algebra | 3 | 0 | 3 | |
| BUSI615 | Principles of Management | 3 | 0 | 3 | |
| COMP613 | Fundamentals of Information Systems | 3 | 0 | 3 | |
| HIST400 | History of Bahrain and GCC Region | 3 | 0 | 3 | |
| SOCI400 | Sociology | 3 | 0 | 3 | |
| EUTH400 | Euthenics 1 | 1 | 0 | 0 | |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|----------------|--------------------------------------|------------|------------|-----------------|-----------------|
| ENGL402 | English Communication 2 | 3 | 0 | 3 | ENGL401 |
| MATH403 | Business Statistics | 3 | 0 | 3 | MATH401 |
| BSIB626 | Business Organization and Management | 3 | 0 | 3 | BUSI615 |
| BUSI621 | Organizational Behavior | 3 | 0 | 3 | |
| BUSI622 | Financial Accounting 1 | 2 | 2 | 3 | |
| BSIB625 | Business Technology Applications | 2 | 2 | 3 | COMP613 |
| EUTH401 | Euthenics 2 | 1 | 0 | 0 | EUTH400 |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|----------------|-------------------------------|------------|------------|-----------------|-----------------|
| ENGL403 | Speech and Oral Communication | 3 | 0 | 3 | ENGL402 |
| HUMR400 | Human Rights | 3 | 0 | 3 | SOCI400 |
| BUSI631 | Principles of Marketing | 3 | 0 | 3 | |

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| | | | | | |
|--------------|---------------------------|---|---|----|---------|
| BSIB636 | Financial Accounting 2 | 3 | 0 | 3 | BUSI622 |
| BUSI632 | Human Resource Management | 3 | 0 | 3 | BUSI621 |
| TOTAL | | | | 18 | |

SECOND YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------|---------------------------------|---------|---------|--------------|-----------------|
| ENGL502 | Technical Writing | 3 | 0 | 3 | ENGL403 |
| ARAB400A | Arabic Language | 3 | 0 | 3 | |
| BUSI711 | Managerial Accounting 1 | 3 | 0 | 3 | BSIB636 |
| BSIB711 | Ethics and Corporate Governance | 3 | 0 | 3 | BSIB626 |
| BUSI712 | Mathematics of Investment | 3 | 0 | 3 | MATH401 |
| BUSI713 | Macroeconomics | 3 | 0 | 3 | BUSI633 |
| TOTAL | | | | | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------|----------------------------|---------|---------|--------------|-----------------|
| BUSI721 | Quantitative Methods | 3 | 0 | 3 | MATH403 |
| ENGL503 | Public Speaking | 3 | 0 | 3 | ENGL403 |
| BSIB721 | Corporate and Business Law | 3 | 0 | 3 | BSIB711 |
| BSIB722 | Marketing Management | 3 | 0 | 3 | BUSI631 |
| BSIB723 | Managerial Accounting 2 | 3 | 0 | 3 | BUSI711 |
| BSIB724 | Managerial Economics | 3 | 0 | 3 | BUSI633 |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------|-------------------------------|---------|---------|--------------|-----------------|
| BSIB731 | International Business Law | 3 | 0 | 3 | BSIB721 |
| BSIB732 | International Economics | 3 | 0 | 3 | BSIB713 |
| BSIB733 | Entrepreneurship & Innovation | 3 | 0 | 3 | BSIB722 |
| BSIB734 | International Business | 3 | 0 | 3 | BSIB722 |
| BSIB735 | Corporate Finance 1 | 3 | 0 | 3 | BUSI712 |
| BSIB736 | Management Information System | 3 | 0 | 3 | BSIB625 |
| TOTAL | | | | 18 | |

THIRD YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|--------------|---------|---------|--------------|-----------------|
|-------------|--------------|---------|---------|--------------|-----------------|

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| | | | | | |
|--------------|---------------------------------------|---|---|---|---------|
| FLAN501 | Foreign Language 1 | 3 | 0 | 3 | |
| BSIB811 | Strategy and International Management | 3 | 0 | 3 | BSIB734 |
| BSIB812 | Cross Cultural Management | 3 | 0 | 3 | BSIB734 |
| BSIB813 | Corporate Finance 2 | 3 | 0 | 3 | BSIB735 |
| BSIB814 | Logistics and Supply Chain Management | 3 | 0 | 3 | BUSI721 |
| BUSI811 | Islamic Banking and Finance 1 | 3 | 0 | 3 | BSIB735 |
| TOTAL | | | | | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|----------------------------------|----------------|----------------|---------------------|-------------------------------|
| FLAN502 | Foreign Language2 | 3 | 0 | 3 | FLAN501 |
| BSIB821 | Digital Business | 3 | 0 | 3 | BSIB733 |
| BSIB822 | International Project Management | 3 | 0 | 3 | BSIB814 |
| BSIB823 | Elective 1 | 3 | 0 | 3 | 3 rd Year Standing |
| BSIB824 | Business Research Methods | 3 | 0 | 3 | ENGL502, MATH403; BSIB812 |
| BSIB825 | International Finance | 3 | 0 | 3 | BSIB813 |
| TOTAL | | | | | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---------------------|----------------|----------------|---------------------|-------------------------------|
| BUSI831 | Business Analytics | 2 | 2 | 3 | BSIB736 |
| BSIB831 | Thesis Writing A | 3 | 0 | 3 | BSIB824 |
| BSIB832 | Internship | 0 | 12 | 6 | 3 rd Year Standing |
| BSIB833 | Elective 2 | 3 | 0 | 3 | 3 rd Year Standing |
| BSIB834 | Elective 3 | 3 | 0 | 3 | 3 rd Year Standing |
| BUSI831 | Business Analytics | 2 | 2 | 3 | BSIB736 |
| TOTAL | | | | | |

FOURTH YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---|----------------|----------------|---------------------|------------------------|
| BSIB841 | International Resourcing and Talent Management | 3 | 0 | 3 | BSIB812 |
| BSIB842 | Global Business Sustainability and Responsibility | 3 | 0 | 3 | BSIB812 |
| BSIB843 | Global Marketing Strategy | 3 | 0 | 3 | BSIB821 |
| BSIB844 | Global Supply Chain Management | 3 | 0 | 3 | BSIB822 |
| BSIB845 | Global Investment and Portfolio Management | 2 | 2 | 3 | BSIB825 |

| | | | | | |
|---------|------------------|---|---|---|---------|
| BSIB846 | Thesis Writing B | 3 | 0 | 3 | BSIB831 |
| TOTAL | | | | | |

ELECTIVE COURSES

MAJOR ELECTIVE 1

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|------------------------------------|---------|---------|--------------|-----------------|
| | International Business Negotiation | 3 | 0 | 3 | |
| | Strategic Leadership | 3 | 0 | 3 | |

MAJOR ELECTIVE 2

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|---|---------|---------|--------------|-----------------|
| | International Business Trends & Seminar | 3 | 0 | 3 | |
| | Managing Quality | 3 | 0 | 3 | |

MAJOR ELECTIVE 3

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|---------------------------|---------|---------|--------------|-----------------|
| | Islamic Banking 2 | 3 | 0 | 3 | |
| | Financial Risk Management | 3 | 0 | 3 | |

14. Awards and Credits

| | |
|-----------------------------|---|
| Degree/ Certificate Awarded | Bachelor of Science in International Business |
| Total Units for Degree | 180 |
| Total Trimesters Completed | 10 |

15. Admission Criteria

Admissions Criteria for Undergraduate Students

B. For First Year Undergraduate Applicants

Acceptance to the University depends on the following admissions requirements:

5. Completely filled out an admission application form.
6. Minimum secondary school scores 60% or its equivalent.
7. Online Placement test (Oxford Online Placement Test (OOPT)) Result (if needed)
8. Submission of all required documents stated in the Admissions Policy.

To be admitted to any undergraduate programme, the applicant must satisfy the minimum secondary school grades or its equivalent without the need to take the remediation classes of English and Math, as shown in the following table:

| Subtest Component for <i>Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification</i> | | Programme |
|--|----------------------------------|----------------------|
| | | BSIB |
| Mathe matics | Science/ Technical/General Track | At least 60% or D |
| | Commercial Track | At least 60% or D |
| | Literature and Islamic Tracks | At least 60% or D |
| Science | | N/A |
| English | | At least 80 or B |

*This is applicable to Bahraini and similarly equivalent qualification

2. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program.

| Subtest Component for <i>Other Qualification (Indian, Pakistan, and West African)</i> | | Programme |
|--|----------------------------------|----------------------|
| | | BSIB |
| Mathematics | Science/ Technical/General Track | At least 41 or C2 |
| | Commercial Track | At least 41 or C2 |

| | | |
|---------|-------------------------------|----------------------|
| | Literature and Islamic Tracks | At least 41 or C2 |
| Science | | N/A |
| English | | At least 71 or B1 |

*Note: Science component is subject to the evaluation of the Dean.

For the undergraduate applicant who did not meet the minimum required secondary school grades in Mathematics and English or its equivalent, his/her admissions depend on the following criteria:

| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|----------------|---|----------------------------------|---|
| All Programmes | 60-79 % grade in English | Score \geq 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| BSIB | Score <60% in Math | N/A | Foundation Course in Math |
| All Programmes | CGPA <60% for Bahraini and KSA CGPA <41% for Indian and Pakistan | N/A | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

f. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

g. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program (English Foundation).

h. IELTS/TOEFL

Applicants who submit official IELTS or TOEFL certificates issued by accredited examination centers, with a minimum score of 450 on the TOEFL (paper-based), 131 on the TOEFL (computer-based),

or 5.0 on the IELTS, are exempted from taking the required English Placement Test.

In addition, applicants who obtain an IELTS score of 5.5 or higher or a TOEFL score that meets the equivalent standard may qualify for English course exemptions based on their results. This policy recognizes academic achievement by allowing eligible students to be exempted from enrolling in introductory English courses upon admission.

| IELTS/TOEFL Scores | Exemption |
|--|--|
| Qualified applicants with 5.5 IELTS scores or TOEFL: 496 (paper-based) or 169 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 (English Communication Skills 1) |
| Qualified applicants with 6.0 IELTS scores or TOEFL: 546 (paper-based) or 211 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 and ENGL402/ENGL621 (English Communication Skills 1 and 2) |

i. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature and Islamic tracks must take the remediation course in Math.

j. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

B. For Undergraduate Transfer Student Applicants

Application Requirements:

7. Completely filled out an admission application form
8. Official Transcript of Records (TOR) from the university previously attended. Rules and

regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school certificates are to be applied when necessary.

9. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
10. Certificate of Transfer from the university previously attended stamped by MOE, if any.
11. Withdrawal Certificate stamped by MOE
12. Submission of all required documents stated in the admissions policy.

Admissions Requirements:

4. For Bahrain and KSA qualifications, the applicant should have at least a secondary school average of 60%. For non-Bahrain secondary qualifications (Indian and Pakistan) the applicant should have at least 41% secondary school average; and for other non-Bahraini qualifications please refer to the table of cut-off.
5. If the applicant has taken and passed courses in English and Mathematics in the previous university, the applicant will be exempted in taking the remedial courses in both English and Mathematics. The applicant may proceed to mainstream university courses and is eligible to apply for credit transfer.
6. If the applicant has not taken any course in English and Mathematics, the basis for evaluation whether remedial course in English and mathematics is required or not is the subject scores in his/her last year in the secondary school certificate using the table presented earlier.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. Practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or re-admitted student from UTB.

The University requires the undergraduate student to complete at least 50% of the required credit units/hours of a programme in residence at UTB. The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit units/hours based on his/her original degree from another university.

16. CGPA Requirement for Graduation

The required CGPA for an undergraduate student to be eligible for graduation is 2.0 out of 4.

17. Career Pathways

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The graduates of the BSIB programme can pursue a career as financial analyst, sales manager, stockbroker, international trader, product manager, management analyst/consultant, economist, business development manager, Foreign Service officer, trade specialist, finance controller, import/export coordinator, marketing manager, public relations specialist, advertising executive, human resources manager, or entrepreneur. In addition, the programme can lead graduates for postgraduate degrees in business.

18. BSIB CURRICULUM SKILLS MAPPING

| Year/Level | Course Code | Course Title | Core C or Option (O) | Program Intended Learning Outcomes | | | | | | | |
|-------------------------------|-------------|--------------------------------------|----------------------|------------------------------------|-----|-----|-----|-----|-----|-----|-----|
| | | | | P 1 | P 2 | P 3 | P 4 | P 5 | P 6 | P 7 | P 8 |
| Year 1 1 st Tri | ENGL401 | English Communication Skills 1 | C | | | | | | | ✓ | |
| | MATH401 | College Algebra | C | | | | | | ✓ | | |
| | BUSI615 | Principles of Management | C | ✓ | ✓ | | ✓ | | | ✓ | |
| | HIST400 | History of Bahrain and GCC Region | C | | | | ✓ | | | | |
| | COMP613 | Fundamentals of Information Systems | C | | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| | SOCI400 | Sociology | C | | | | ✓ | | | | |
| | EUTH400 | Euthenics1 | C | | | | | | | | |
| Year 1 2 nd Tri | ENGL402 | English Communication2 | C | | | | | | | ✓ | |
| | MATH403 | Business Statistics | C | | | | | | ✓ | | |
| | BSIB626 | Business Organization and Management | C | ✓ | | | ✓ | | ✓ | | |
| | BUSI621 | Organizational Behavior | C | ✓ | ✓ | ✓ | | | | ✓ | ✓ |
| | BUSI622 | Financial Accounting 1 | C | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| | BSIB625 | Business Technology Applications | C | | | | | | ✓ | ✓ | ✓ |
| | EUTH401 | Euthenics2 | C | | | | | | | | |
| Year 1 3 rd Tri | ENGL403 | Speech and Oral Communication | C | | | | | | | ✓ | |
| | HUMR400 | Human Rights | C | | | | ✓ | | | | |
| | BUSI631 | Principles of Marketing | C | ✓ | ✓ | | | ✓ | | | |
| | BSIB636 | Financial Accounting 2 | C | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ |
| | BUSI632 | Human Resources Management | C | ✓ | | ✓ | ✓ | | ✓ | ✓ | |
| | BUSI633 | Microeconomics | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Year 2 | ENGL502 | Technical Writing | C | | | | | | | ✓ | ✓ |

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| | | | | | | | | | | | |
|--------------------------------------|--------------|--|---|---|---|---|---|---|---|---|---|
| 1st Tri | ARAB400 A | Arabic Language | C | | | | | | | ✓ | |
| | BUSI711 | Managerial Accounting 1 | C | ✓ | | ✓ | ✓ | | | | |
| | BUSI712 | Mathematics of Investment | C | ✓ | | ✓ | ✓ | | | | |
| | BUS1713 | Macroeconomics | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | BSIB711 | Corporate Governance and Ethics | C | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| Year 2 2nd Tri | BUSI721 | Quantitative Methods | C | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| | ENGL503 | Public Speaking | C | | | | | | | ✓ | |
| | BSIB721 | Corporate and Business Law | C | ✓ | ✓ | | ✓ | ✓ | | ✓ | |
| | BSIB722 | Marketing Management | C | ✓ | | ✓ | ✓ | | | ✓ | ✓ |
| | BSIB723 | Managerial Accounting 2 | C | ✓ | ✓ | ✓ | | | ✓ | | |
| | BSIB724 | Managerial Economics | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Year 2 3rd Tri | BSIB731 | International Business Law | C | ✓ | ✓ | | ✓ | | | ✓ | |
| | BSIB732 | International Economics | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | BSIB733 | Entrepreneurship & Innovation | C | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| | BSIB734 | International Business | C | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | BSIB735 | Corporate Finance 1 | C | ✓ | ✓ | | ✓ | ✓ | | ✓ | |
| | BSIB736 | Management Information System | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Year 3 1st Tri | FLAN501 | Foreign Language 1 | C | | | | | | | ✓ | |
| | BSIB811 | Strategy and International Management | C | ✓ | ✓ | | ✓ | | | ✓ | ✓ |
| | BSIB812 | Cross Cultural Management | C | ✓ | | | ✓ | | ✓ | | |
| | BSIB813 | Corporate Finance 2 | C | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | BSIB814 | Logistics and Supply Chain Management | C | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| | BUSI811 | Islamic Banking and Finance 1 | C | ✓ | ✓ | | ✓ | | ✓ | | |
| Year 3 2nd Tri | FLAN502 | Foreign Language2 | C | | | | | | | ✓ | |
| | BSIB821 | Digital Business | C | ✓ | | ✓ | | | | ✓ | |
| | BSIB822 | International Project Management | C | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| | BSIB823 | Elective 1 | C | | | | | | | | |
| | BSIB824 | Research Methods | C | ✓ | | ✓ | | ✓ | ✓ | ✓ | |
| | BSIB825 | International Finance | C | ✓ | | | ✓ | | ✓ | ✓ | ✓ |
| Year 3 3rd Tri | BUSI831 | Business Analytics | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | BSIB831 | Thesis Writing A | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | BSIB832 | Internship | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | BSIB833 | Elective 2 | O | | | | | | | | |
| | BSIB834 | Elective 3 | O | | | | | | | | |
| Year 4 2nd Tri | BSIB841 | International Resourcing and Talent Management | C | ✓ | ✓ | ✓ | | | | ✓ | ✓ |

| | | | | | | | | | | | |
|--|---------|---|---|---|---|---|---|---|---|---|---|
| | BSIB842 | Global Business Sustainability and Responsibility | C | ✓ | ✓ | | ✓ | | | ✓ | ✓ |
| | BSIB843 | Global Marketing Strategy | C | ✓ | ✓ | | ✓ | | | ✓ | |
| | BSIB844 | Global Supply Chain Management | C | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| | BSIB845 | Global Investment and Portfolio Management | C | ✓ | | | ✓ | | ✓ | ✓ | ✓ |
| | BSIB846 | Thesis Writing B | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

BACHELOR OF SCIENCE IN INTERNATIONAL BUSINESS (BSIB)
CURRICULUM PLAN EFFECTIVE AY2021-2022

COURSES DESCRIPTION

FOUNDATION COURSES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|---|---------------------------|---------|---------|--------------|------------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| This course is a foundation in mathematics focusing on the building of the knowledge and skills and understanding to solve problems in college algebra and trigonometry. It deals with the topics on equations and Inequalities; functions and graphs; polynomial and rational Functions; exponential and logarithmic functions; trigonometric functions; trigonometric identities and equations; application of trigonometry; systems of equations and inequalities; and matrices. It also includes the application of the mathematical thinking process. | | | | | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| ENGL500 is a required foundation course for entering students whose English language skills need further improvement and enhancement to be able to cope with the university's academic courses. This course introduces the students to the English language where they get involved and engaged in the learning process. It utilizes an integrated approach in developing the students' English macro communication skills in speaking, listening, grammar, and vocabulary in one phase (preintermediate) which will serve as the benchmark for the next level first year English course. Furthermore, the course intensifies its intended learning objectives with the comprehensive utilization of audio-lingual presentations, includes information related to dictionary use, basic grammar rules, daily use vocabulary words through a variety of contexts, written responses, writing structures, settings of writing, and the process of forming written and spoken communications. Hence, the students are expected to gain more knowledge to communicate effectively in English. | | | | | |

FIRST YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC HRS | LAB HRS | CREDIT UNITS | PRE-REQUISITE(S) |
|--|--------------------------------|---------|---------|--------------|------------------|
| ENGL401 | English Communication Skills 1 | 3 | 0 | 3 | |
| This is an introductory course in English communication designed to provide comprehensive, up-to-date and relevant instruction in the correct use of grammar. It intends to build up students' confidence in | | | | | |

communicating their thoughts, ideas, information and messages through the functions and structures of different words, phrases, clauses, sentences and paragraphs. In addition, the integration of language skills increases their communicative competence and prepares them for the academic and social challenges in college and beyond.

MATH401**College Algebra****3****0****3**

This course is designed to familiarize learners with main theories, principles and concepts of college algebra that are useful in analysis and simplification of basic and some advanced mathematical problems. Content includes functions which are polynomial, rational, exponential, logarithmic and related equations. Sketching graphs, Matrices, determinants, progressions and inequalities as applied to engineering.

BUSI615**Principles of Management****3****0****3**

This is an introductory course for the study of management and the role it plays in organizations. It introduces students to the ideas of managerial levels, skills, and management 'concepts. It develops their understanding about how successful employees and managers operate. The course begins with a historical overview of the management field and evolution of management thought. Additionally, the course focuses on the management process/ managerial functions such as planning, organizing, leading, and controlling.

COMP613**Fundamentals of Information
Systems****3****0****3**

This course focuses on the detailed knowledge on management information systems by establishing a link between business processes and information technology. It includes the topics on decision making frameworks, types of information systems, systems development, networks, IT infrastructure and, social impacts of IT.

HIST400**History of Bahrain and the GCC
Region****3****0****3**

This Course includes the history of the Kingdom of Bahrain and the Arabian Gulf region. It includes the important events in Bahrain and the Arabian Gulf region and their impact on the current situation. It covers the strategic importance of Bahrain, starting with "Ancient civilizations and passing through" the Islamic era, Bahrain's entry into Islam, Portuguese occupation, competition of powers in the 17th century and the rise of a tribe of Al-Atub. It includes the history of Bahrain under the British protection and the conventions between Bahrain and Great Britain up to British troops leaving the region. It describes the places and persons as well as the historical developments and achievement in Bahrain during the time of Al- Khalifah. It includes independence of Bahrain, issuing of the first constitutional law, reform project by His Majesty King Hamad, constitutional amendments, establishment of GCC, history of Arab Gulf states. It makes the student able to present his patriotic character through historical discussions.

SOCI400**Sociology****3****0****3**

This course is designed to expose students in a detailed approach of studying society. It intends to give emphasis on the sociological perspectives, relationships with other social sciences, the main figures in sociological development, including introduction to culture, transformation of societies, importance of socialization, social groups, deviance and social control. Further, it incorporates the discussions on social institutions that enable the college students to understand the economic perspective from ancient to present, the evolution of education and the current viewpoint of family.

EUTH400**Euthenics 1****1****0****0**

This course is designed to bring in the policies and procedures in the university, to guide the students in the performance of their respective role and to become adept on ideals needed in their academic pursuit. Thus, students are oriented on the history, vision, mission, values and objectives of the university, the services and academic support available, the academic and non-academic policies, the different misconduct and violations with corresponding penalties in which the learning objectives are better facilitated by various classroom

discussion through collaborative teamwork learning experience.

TOTAL

18

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE/S |
|--|--------------------------------------|------------|------------|-----------------|----------------|
| ENGL402 | English Communication Skills 2 | 3 | 0 | 3 | ENGL401 |
| This is an intermediate course in English communication geared towards equipping the college students with writing skills in preparation for academic writing. It progresses from familiarizing the sentence conventions to balancing the structures of the sentence for variation and rhythm. Further, it enables students to follow the principles that govern the composition writing in achieving unity, coherence and emphasis; to improve their expository, descriptive, narrative and argumentative works and to get hold of the discipline in academic writing for future advantages by providing them the opportunity in adhering the process of writing for effective communication. | | | | | |
| MATH403 | Business Statistics | 3 | 0 | 3 | MATH401 |
| The course deals with the study of the fundamental concepts and principles in statistics and its application to business. It covers concepts on collecting, organizing and presenting data, numerical descriptive measures. It also identify the theorem of probability, probability distributions and link it with real life problems, it also covers inferential measures and how we interpret the data for decision making. | | | | | |
| BSIB626 | Business Organization and Management | 3 | 0 | 3 | BUSI615 |
| The course exposes students to the basic concepts of the organization, its characteristics, and legal forms. It focuses on the provision of a comprehensive understanding of the organizational functions (production, marketing, finance, human resource, knowledge & information and management). Additionally, it covers the organization's relationship with the surrounding environment. | | | | | |
| BUSI621 | Organizational Behavior | 3 | 0 | 3 | |
| The course deals with a comprehensive analysis of human behavior at both individual and organizational levels. Topics include personality and attitudes, perception and attribution, motivation, communication, work stress, group and team dynamics, leadership, decision making, quality, ethics, job and organization design, conflict management, organizational culture and politics, and organizational change. | | | | | |
| BUSI622 | Financial Accounting 1 | 2 | 2 | 3 | |
| This course provides students with an overview of fundamental financial accounting concepts with a focus on learning the accounting cycle from different forms of organization. Through a primary review of accounting transactions, integrated real-world examples, and a variety of practice opportunities, the course emphasis on the application of accounting principles and techniques in practice. | | | | | |
| BSIB625 | Business Technology Applications | 2 | 2 | 3 | COMP613 |
| This course is designed to develop the technological proficiencies of the students in word processing, spreadsheets, presentations, data visualization, electronic mail, and internet browsing. | | | | | |
| EUTH401 | Euthenics 2 | 1 | 0 | 0 | EUTH400 |
| This course is designed to provide the discussion on the students' rules and regulations of the university in order to practice the right conduct of behavior inside and outside the university premises. It intends to teach the students on the different stages of personality development, the equivalent penalties in different academic offences and factors that influence behavioral multiple intelligences. Further, the incorporation of oral/written communication through individual and group discussions can encourage learners to ponder on | | | | | |

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BSIB PROGRAMME SPECIFICATIONS AY 2021-2022

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the meaning of life and discover the purpose of their existence.

TOTAL

18

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|-------------------------------|-----------|---------|--------------|-----------------|
| ENGL403 | Speech and Oral Communication | 3 | 0 | 3 | ENGL402 |
| This is a developmental course in English communication geared towards competent, efficient, and effective interpersonal speaking across communicative contexts. It refines oral communication skills through accurate articulation of segmental phonemes, pronunciation drills and enunciation of the suprasegmental features of speech, specifically sentential stress and intonation. Further, it incorporates the mechanics and techniques of speech craft and delivery with emphases on practical speaking experiences and analysis of audience psychology, which are deemed applicable in diverse speech situations. | | | | | |
| HUMR400 | Human Rights | 3 | 0 | 3 | SOCI400 |
| This course makes the students able to know the background, main concepts of Human Rights and the philosophical thoughts and Islamic view which contribute to modern Human Rights. It makes them able to analyze what is mentioned in different kinds of Human Rights sources such as Universal Declaration of Human Rights, International Covenant on Civil and Political Rights and International Covenant on Economic, Social and Cultural Rights. It deals in the same approach with the National Sources of Human Rights such as the Constitutional Law of Kingdom of Bahrain and National Action Charter with applications as well. The course makes the students able to analyze, discuss and debate Human Rights issues in different ways. | | | | | |
| BUSI631 | Principles of Marketing | 3 | 0 | 3 | |
| This course focuses on the essentials of marketing, its nature and its scope that are crucially important to the organization's success in a dynamic environment. The course provides a broad background on the marketing concept, the role of marketing both within the organization and within the external environment, the marketing mix, (product, place, promotion, and price), market segmentation, targeting and positioning, consumer, and business behavior. | | | | | |
| BSIB636 | Financial Accounting 2 | 3 | 0 | 3 | BUSI622 |
| This course deals with transactions, financial statements, and problems peculiar to the operations of partnerships and corporations. It emphasizes on the formations, operations, dissolution, and liquidation of partnerships, and the basic considerations in forming a corporation and stock transactions. | | | | | |
| BUSI632 | Human Resource Management | 3 | 0 | 3 | BUSI621 |
| This course is an introductory course for Human Resource Management (HRM); it is designed to cover the major topics and issues related to HRM, which will help the student understand and analyze the role that HRM plays in formulating and implementing organizational strategy and in achieving overall organizational efficiency and effectiveness. The course exposes students to HRM concepts, objectives, and functions. It also looks at diverse challenges that face HRM in its environment. Additionally, the course focuses on the scope of HRM in terms of job analysis, Human resources planning and recruiting, selection, training, and performance evaluation and appraisal. | | | | | |
| TOTAL | | 18 | | | |

SECOND YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|--------------|---------|---------|--------------|-----------------|
|-------------|--------------|---------|---------|--------------|-----------------|

| | | | | | |
|--|---------------------------------|---|---|-----------|---------|
| ENGL502 | Technical Writing | 3 | 0 | 3 | ENGL403 |
| This is an advanced course in English academic writing designed to deal with the application of the technical writing principles with the correspondence on business, science, and technology. It aims to develop the technical writing skills and communication of the college students thru the discussions of its elements and ethics with the use of digital technologies. Furthermore, it enables students to adapt the various communication routes in the workplace, to conceptualize suitable contents of technical writing, to understand the characteristics and other methods of communication techniques, to plan and organize advanced level tasks and to work effectively and with accountability with other team members in a creative and productive manner, in any language learning scenario when achieving personal and group outcomes. | | | | | |
| ARAB400A | Arabic Language | 3 | 0 | 3 | |
| The course focuses on the fundamentals of Arabic language, such as reading, analyzing, and critique. It explains the characteristics of the required texts, which deal with different literary genres, prose and poetry. The course also focuses on the understanding and application of grammatical rules and basic morphological methods in Arabic, taking into account the correct spelling skills. | | | | | |
| BUSI711 | Managerial Accounting 1 | 3 | 0 | 3 | BSIB636 |
| This course covers the use of accounting information for internal planning, analysis, and decision-making with a focus on information generated by internal accounting systems. It focuses on equipping students with the knowledge to prepare, understand, evaluate, and act upon the many financial and non-financial reports used in managing modern firms. Such information is a key input into a wide range of analytical tools to support decisions: analyzing the profitability of various products, managing product-line portfolios, setting prices, measuring and managing the profitability of customers, making operational and strategic decisions, evaluating investments, and investigating efficiency. | | | | | |
| BSIB711 | Ethics and Corporate Governance | 3 | 0 | 3 | BSIB626 |
| The course provides advanced knowledge and understanding of the core ethical dimensions of business as they relate to the various stakeholders inside and outside the organization. Topics may include business ethical theory, ethical decision making, typical dilemmas and corporate social responsibility. | | | | | |
| BUSI712 | Mathematics of Investment | 3 | 0 | 3 | MATH401 |
| The course is a mathematical treatment of the methods used in understanding concepts, mathematical problems and solutions concerning money transaction associated with interest and time. It integrates practical and theoretical aspects of finance and investments essential for the success of all business disciplines. It also covers the theories and applications of simple and compound interest, annuity, stock, and bonds. | | | | | |
| BUS1713 | Macroeconomics | 3 | 0 | 3 | BUSI633 |
| The primary focus of this course is twofold: (1) understanding the core macroeconomic concepts of growth, inflation, and unemployment – and how they are interrelated and (2) understanding how fiscal and monetary policy at both the national and international level influences these concepts. This course also covers concepts such as GDP, inflation, unemployment, usage of monetary and fiscal policies, in real world setting. | | | | | |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|----------------------|----------------|----------------|---------------------|------------------------|
| BUSI721 | Quantitative Methods | 3 | 0 | 3 | MATH403 |
| This course provides an introduction to the concepts and applications of quantitative methods in management. It develops mathematical and statistical competences necessary to facilitate progression in courses such as Operations Management. This course builds on the concepts and analytical tools taught in | | | | | |

Principle of Statistics. This course focuses on developing quantitative methods, such as, linear programming, sensitivity and duality theory, transportation and assignment problems, network, and queuing theory in addition to waiting line, game theory and simulation.

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|---------|-----------------|---|---|---|---------|
| ENGL503 | Public Speaking | 3 | 0 | 3 | ENGL403 |
|---------|-----------------|---|---|---|---------|

This 3-unit course deals with the academic study of public speaking, its functions in present day situations in a culturally diverse society. It develops competent communicators and prepares students for communication challenges in local, as well as global contexts. Further, it is an avenue for students to embody the 3Cs of an effective public speaker: competence, character and composure, of which are essential in the demands of business-related correspondence and communication.

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|---------|----------------------------|---|---|---|---------|
| BSIB721 | Corporate and Business Law | 3 | 0 | 3 | BSIB711 |
|---------|----------------------------|---|---|---|---------|

This course develops an advanced knowledge and understanding of the general legal framework and of specific legal areas relating to business. It covers topics on employment law, formation and constitution of companies, the financing of companies and types of capital, administration, and regulation of companies. It also deals with the legal aspects of insolvency.

| | | | | | |
|---------|----------------------|---|---|---|---------|
| BSIB722 | Marketing Management | 3 | 0 | 3 | BUSI631 |
|---------|----------------------|---|---|---|---------|

This course covers interrelated dynamic elements of the marketing process used in the market landscape. The course focuses on the role and reach of marketing in the business environment as well as the numerous elements and functions of marketing activities. During this course the student will learn to think like marketers and will understand how marketing managers' use marketing elements to enable the business organizations to gain a competitive advantage.

| | | | | | |
|---------|-------------------------|---|---|---|---------|
| BSIB723 | Managerial Accounting 2 | 3 | 0 | 3 | BUSI711 |
|---------|-------------------------|---|---|---|---------|

This course covers an advanced knowledge and understanding of the management accounting concepts and techniques for performance measurement and for decision making. Topics covers some specialist cost and managerial accounting techniques; decision-making techniques; budgeting; variance analysis; performance management systems, performance measurement, and control.

| | | | | | |
|---------|----------------------|---|---|---|---------|
| BSIB724 | Managerial Economics | 3 | 0 | 3 | BUSI633 |
|---------|----------------------|---|---|---|---------|

This course focuses primarily on the application of economic theory with business practice, for effective corporate decision-making - such as price-setting, output-setting, advertising, product differentiation, vertical integration, and collusive behavior. In this context, both the role of competition and the determinants of market structure is emphasized.

| | |
|--------------|-----------|
| TOTAL | 18 |
|--------------|-----------|

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|----------------------------|---------|---------|--------------|-----------------|
| BSIB731 | International Business Law | 3 | 0 | 3 | BSIB721 |
| This course covers the legal environment of international business and contracting, international and U.S. trade laws and treaties, regulation of the international marketplace, legal theories, ethical issues, and regulatory climate affecting business policies and decisions. Topics include the classification and sources of law; contracts and functions of contracts; and forms of negotiable instruments. | | | | | |
| BSIB732 | International Economics | 3 | 0 | 3 | BSIB713 |
| This course deals with advanced theories of International Economics in real-life situations. It focuses on comparing international trade theories, and trade models, evaluating tariffs and non-tariffs, and trade barriers. This course also highlights the causes and solutions of financial crises in emerging economies. | | | | | |

| | | | | | |
|---|-------------------------------|---|---|-----------|---------|
| BSIB733 | Entrepreneurship & Innovation | 3 | 0 | 3 | BSIB722 |
| The course introduces students to the main concepts of innovation. Throughout the course, students will learn how innovation is crucial for both individuals and organizations. Students will be provided with various tools and methods to promote innovation capacity within themselves and others. The course will equip students with the knowledge of how to contribute as an innovative team, how innovation is managed in real work situations, and how to spread innovation culture within a business organization. The course itself draws upon real-world examples and experiences of leading organizations from around the world using case studies. | | | | | |
| BSIB734 | International Business | 3 | 0 | 3 | BSIB722 |
| The course covers a basic understanding of how to manage business across borders. Both opportunities and risks are assessed in international markets. The course will expose students to differences between domestic and international business. Several topics are covered within the course such as international business entry modes, cultural effects on both organizational and individual behaviour, economic integration schemes, firm specific and country specific elements and their impact on creating competitive advantages. Moreover, the course explores the legal, business, social, political forces, governmental regulations, labour force and competition in international environment. | | | | | |
| BSIB735 | Corporate Finance 1 | 3 | 0 | 3 | BUSI712 |
| This course explores the core theories, concepts, and principles of corporate finance used in managerial decisions. It focuses on analyzing firm's financial performance using financial ratio analysis, discussion of time value of money (TVM) and its usage in the valuation of bonds and stocks. Additionally, the course expose students to the methods for computing company' cash flow. | | | | | |
| BSIB736 | Management Information System | 3 | 0 | 3 | BSIB625 |
| This course provides student with an introduction to Information Systems (IS) and Information Technology (IT) and their use in an increasingly competitive business world and supports them in making decisions concerning the planning, development, and implementation of information technology resources to increase organizational effectiveness and create a strategic advantage. | | | | | |
| TOTAL | | | | 18 | |

THIRD YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|---------------------------------------|----------------|----------------|---------------------|------------------------|
| FLAN501 | Foreign Language 1 | 3 | 0 | 3 | |
| This course aims to develop among the students the skills needed to be able to understand and speak Basic French. The students are expected to gain basic knowledge to communicate effectively in French. Recognize the effective use of French language in oral communication in various situations. Pronounce words, phrases, sentences with the correct accent; utilize the conventions of standard French in listening and speaking; familiarity with the rules in French grammar and structure of sentences in French; infer meanings from short conversations; identify facts and opinions from varied selections; and opinions from varied selections, and communicate effectively in French. | | | | | |
| BSIB811 | Strategy and International Management | 3 | 0 | 3 | BSIB734 |
| This course provides students with critical understanding of business firms as principal actors in a global system by integrating insights from the global manager's environment and cultural context. Global human resource functions, managing social responsibilities in international markets, organizational structure and control and global alliances are discussed in detail to provide students with a comprehensive overview of strategy formulation in international businesses. | | | | | |

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| | | | | | |
|---|---------------------------------------|---|---|-----------|---------|
| BSIB812 | Cross Cultural Management | 3 | 0 | 3 | BSIB734 |
| This course exposes the student to the business environment in the Kingdom of Bahrain. It covers public sector regulations and policies as well as the role of Central Bank of Bahrain in adjusting the national economy beside the contribution of Tamkeen and Labour Market Regulatory Authority to small and medium enterprises as part of Bahrain vision 2030. | | | | | |
| BSIB813 | Corporate Finance 2 | 3 | 0 | 3 | BSIB735 |
| This course examines advanced issues in corporate finance from the perspective of financial managers who are responsible for making significant investment and financing decisions both within the firm and in their interactions with investors. The course topics includes criteria for making investment decisions, valuation of financial assets and liabilities, relationships between risk and return, capital structure choice, payout policy, the effective use and valuation of derivative securities (futures, options, and convertible securities), and risk management. | | | | | |
| BSIB814 | Logistics and Supply Chain Management | 3 | 0 | 3 | BUSI721 |
| This BSIB course explores the overview of logistics; logistics and information technology; organizational and managerial issues in logistics (including reverse logistics); the supply chain management concept; demand management; order management and customer service; inventory management; distribution center; warehouse and plant location; warehousing management; packaging and materials management; transportation and transportation management and international logistics. | | | | | |
| BUSI811 | Islamic Banking and Finance 1 | 3 | 0 | 3 | BSIB735 |
| This course introduces students with economic rationale of Islamic values in Islamic financial system. It covers topics on the core principles and basic models of Islamic finance and establishes a framework for understanding this financial system. It examines how and why Islamic values determine the business climate. It provides a clear framework for analyzing the micro- and macro-economic foundations of the Islamic system. | | | | | |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|----------------------------------|---------|---------|--------------|-----------------|
| FLAN502 | Foreign Language2 | 3 | 0 | 3 | FLAN501 |
| This course aims to equip the college students with the skills necessary for a meaningful communication in French. Understand the rules of French grammar and structure of sentences in French. Identify facts and opinions from varied selections; use punctuation marks as connectors in writing to describe elements of civilization; formulate sentences, drafts and revise texts; follow a process in catalogues, advertisements/slogans; engage in textual analysis techniques; engage in meaningful life situations using persuasive statements and demonstrate skills in oral/written communications in French. | | | | | |
| BSIB821 | Digital Business | 3 | 0 | 3 | BSIB733 |
| This course critically provides insight into the emergence of the digital economy that has unlocked new opportunities, leading to the creation of new innovations in data driven industries. It covers business driven technology, business strategies, innovative organization, e-business, collaborative partnership, business intelligence, global information systems and global trends. | | | | | |
| BSIB822 | International Project Management | 3 | 0 | 3 | BSIB814 |
| This course covers the advanced processes, methods, techniques and tools that organizations use to manage projects. It focuses on a systematic methodology for initiating, planning, executing, controlling and closing project. Drawing that project management in the modern organization is a complex-based activity, where | | | | | |

various types of technologies are an inherent part of the project management process. It also acknowledges that project management involves both the use of resources from within the firm, as well as contracted from outside the organization.

| | | | | | |
|---------|---------------------------|---|---|---|-------------------------------|
| BSIB823 | Elective 1 | 3 | 0 | 3 | 3 rd Year Standing |
| BSIB824 | Business Research Methods | 3 | 0 | 3 | ENGL502, MATH403; BSIB812 |

The course studies the scope and significance of business research. It introduces students to the various aspects of business research, its types, tools, and methods, and students will learn how to apply business research techniques to real-world situations. The course covers topics such as the identification of a topic by the student, proposition of hypothesis, formulation of research questions, development of literature review, select research design and methodologies. Additionally, students will learn data collection techniques, primary and secondary data with application to specific problems, scaling and research instrument design, and sampling design.

| | | | | | |
|---------|-----------------------|---|---|---|---------|
| BSIB825 | International Finance | 3 | 0 | 3 | BSIB813 |
|---------|-----------------------|---|---|---|---------|

The course provides students with knowledge in international finance that will be particularly valuable to those interested in pursuing financial management careers offered by multinational corporations. It focuses on the foreign exchange market, international parity relationship, international monetary system, forecasting foreign exchange rates, and futures and options on foreign exchange. Students will learn how to apply their knowledge to a variety of real-world problems and form their own opinions about pertinent issues arising from international trade and financial transactions.

TOTAL 18**THIRD TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|---------------------|----------------|----------------|---------------------|-------------------------------|
| BUSI831 | Business Analytics | 2 | 2 | 3 | BSIB736 |
| This course provides students with the essential concepts and tools needed to understand the emerging role of business analytics in organizations. The course covers understanding, application, analysis, and evaluation of descriptive, predictive, and prescriptive data mining and analytical approaches, methods, techniques, and tools placed and practiced in a spreadsheet environment and other useful applications to develop significant insights for effective business decision making. | | | | | |
| BSIB831 | Thesis Writing A | 3 | 0 | 3 | BSIB824 |
| This course helps students develop the entrepreneurial skills required to design, refine, and commercialize new goods and services. Students will learn to work in interdisciplinary groups across three phases of entrepreneurship: ideation, planning, and implementation. Students in this initiative learn through experiencing the idea-to-venture process in an educational environment that is hardwired to encourage the development of original, inventive, and commercially viable ventures. | | | | | |
| BSIB832 | Internship | 0 | 12 | 6 | 3 rd Year Standing |
| This course helps students to have the opportunity to develop new skills through experiential learning under the direction of a skilled practitioner. The arrangements for the working relationship must be established prior to the assignment. | | | | | |
| BSIB833 | Elective 2 | 3 | 0 | 3 | 3 rd Year Standing |
| BSIB834 | Elective 3 | 3 | 0 | 3 | 3 rd Year Standing |
| BUSI831 | Business Analytics | 2 | 2 | 3 | BSIB736 |

This course provides students with the essential concepts and tools needed to understand the emerging role of business analytics in organizations. The course covers understanding, application, analysis, and evaluation of descriptive, predictive, and prescriptive data mining and analytical approaches, methods, techniques, and tools placed and practiced in a spreadsheet environment and other useful applications to develop significant insights for effective business decision making.

TOTAL**FOURTH YEAR****FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|---|----------------|----------------|---------------------|------------------------|
| BSIB841 | International Resourcing and Talent Management | 3 | 0 | 3 | BSIB812 |
| This course demonstrates critical understanding of the key aspects of international human resource management. It focuses on a range of approaches to resourcing and talent management at operational and strategic levels and critically analyzes their impact from contrasting organizational, cultural, and societal perspectives. It equips students with an appreciation of the global employment issues which may impact on resourcing and talent management strategy across a variety of sectors. | | | | | |
| BSIB842 | Global Business Sustainability and Responsibility | 3 | 0 | 3 | BSIB812 |
| This course critically examines the global environmental influences on acting in a socially responsible way; foreign buyer reactions to responsible business and international market targeting to development of socially responsible international business strategies. It focuses on the strategies, practices, and the sustainability reporting framework that companies can use to contribute to the achievement of UN Sustainable Development Goals. | | | | | |
| BSIB843 | Global Marketing Strategy | 3 | 0 | 3 | BSIB821 |
| The course covers the core theories, concepts and principles of marketing as applied to the global environment. It acknowledges the international similarities and differences in marketing functions as related to the marketing environment. The course emphasizes on understanding and applying cultural differences, unique product needs, and pertinent changes in marketing mix across international borders. | | | | | |
| BSIB844 | Global Supply Chain Management | 3 | 0 | 3 | BSIB822 |
| This BSIB course explores the fundamental principle of Supply Chain and logistics. The supply chain management concept; green supply chain, challenges faced by supply chain organization; order management and customer service; warehouse and plant location; warehousing management; packaging and materials management; transportation and transportation management, international logistics and supply chain network. | | | | | |
| BSIB845 | Global Investment and Portfolio Management | 2 | 2 | 3 | BSIB825 |
| This course examines the investment process and portfolio management's critical concepts and their applications in the global financial market. Hence, the course will allow the student acquire professional-level skills in creating and managing their investment portfolios based on a combination of specialized methods in analyzing, evaluating, and applying fundamental and technical indicators. | | | | | |
| BSIB846 | Thesis Writing B | 3 | 0 | 3 | BSIB831 |

This course is a continuation of Entrepreneurship Program A. It provides an overview of entrepreneurship and planning new business ventures for aspiring entrepreneurs and managers. The objective is to create and present a high-quality business plan for a new venture using marketing research and financial analytical techniques.

| | |
|--------------|----|
| TOTAL | 18 |
|--------------|----|

ELECTIVE COURSES

MAJOR ELECTIVE 1


| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PREREQUISITE(S) |
|---|------------------------------------|-----|-----|--------|-----------------|
| | International Business Negotiation | 3 | 0 | 3 | |
| The course provides an in-depth understanding of the theoretical and practical skills needed to engage in negotiations, at both the domestic and international level. The course guides the students through cutting edge debates within the field of international negotiation and mediation and introduces them to the challenges of practical aspects of negotiation through in-class simulations. | | | | | |
| | Strategic Leadership | 3 | 0 | 3 | |
| The course is designed to provide detailed understanding about leadership strategies of successful organizations and apply strategic and leadership models towards the success of an organization. It enables students to focus on various issues and challenges a leader encounter in managing organizations as well as the exploration of one's own strengths and weaknesses. | | | | | |

MAJOR ELECTIVE 2

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PREREQUISITE(S) |
|---|---|-----|-----|--------|-----------------|
| | International Business Trends & Seminar | 3 | 0 | 3 | |
| This course aims to provide an avenue for the students to learn the recent developments and business trends related to accounting, finance, and other fields of business. Students will have an opportunity to work with guest faculty and business and other practitioners; and/or attend business conferences, webinars, and seminars. | | | | | |
| | Managing Quality | 3 | 0 | 3 | |
| The course deals with the critical knowledge and understanding of the scientific approach to management and employees to be involved in the continuous improvement of processes underlying the production of goods and services. The course intends to develop specialized skills with the learners along with the advanced knowledge on the process of total quality management. | | | | | |

MAJOR ELECTIVE 3

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PREREQUISITE(S) |
|--|---------------------------|-----|-----|--------|-----------------|
| | Islamic Banking 2 | 3 | 0 | 3 | |
| This course provides students with deeper details of the Islamic Banking functions and products and tools available to investors, which enables students to formulate methods and strategies to identify solutions to Islamic banking finance problems and challenges. The major focus is on Islamic banking products like Islamic banking Retail Products of Vehicle, Machine and home finance (Ijara, Murabaha and diminishing Musharaka), Sukuk fund management, basis of Takaful compared to other conventional insurance. | | | | | |
| | Financial Risk Management | 3 | 0 | 3 | |

| | | |
|--|---------------------|-----------|
|  University of Technology Bahrain | Doc. No. | QR-AAD-01 |
| | Revision No. | 01 |
| | Date of Effectivity | 01-09-23 |
| College: College of Administrative and Financial Sciences | | |
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This course provides the student with the different types of risks faced by corporations and frameworks for assessing and mitigating those risks. It aims to cover topics on instruments such as options, futures, pricing and hedging. This course also aims to introduce skills needed to get ready for a career in the banking and finance industry.



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| | |
|--|---|
| 1. Teaching Institution | UTB University of Technology Bahrain |
| 2. University Department | College of Administrative and Financial Sciences (CAFS) |
| 3. Programme Title | Bachelor of Science in Accounting and Finance (BSAF) |
| 4. Title of Final Award | Bachelor of Science in Accounting and Finance (BSAF) |
| 5. Mode of Attendance | Actual classroom learning-interactive (Full-time) |
| 6. Delivery Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | NQF Level 8 540 NQF Credits (180 ACS Credits) |
| 8. Accreditation | NONE |
| 9. Other external influences | Local External Influences\ References Ministry of Education (MOE), Higher Education Council (HEC) Bahrain Education and Training Quality Authority (BQA) International External Influences\References European Council for Business Education Standards (ECBE) International Accounting Education Standards Board Association of Chartered Certified Accountants (ACCA) QAA-UK 2019 Subject Benchmark Statement for Accounting |
| 10. Date of production\revision of this specification | September, 2022 |
| 11. Aims Programme | |
| <p>The Bachelor of Science of Accounting and Finance is designed to equip students with thorough working knowledge, skills, professional values, ethics, and attitudes and the need to integrate these elements to perform the role required in the field of accounting and finance. It has strong emphasis on learning how to apply accounting and financial expertise in the exercise of ethically informed judgment in the complex contexts of the modern world.</p> <p>Graduates of the programme three (3) to five (5) years after graduation shall be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate technical competence, professional skills, and professional values, ethics and attitude that enable them to make positive contributions to the profession and throughout their professional lives. 2. Employ technology as a business tool in capturing financial and non-financial information, generating reports and decision making. 3. Promote professionalism and high ethical standards in the field of accounting and finance disciplines that recognize personal, corporate, and professional responsibility in global financial arena. | |
| 12. Learning Outcomes, Teaching, Learning and Assessment Methods | |
| <ol style="list-style-type: none"> 1. Demonstrate detailed knowledge and understanding of principles, conventions, concepts, theories and the empirical evidence related to accounting, finance and other key functional areas of business. 2. Apply principles, standards, concepts, facts, and procedures on accounting and non-accounting information to perform financial, audit and taxation functions and\prepare related reports. | |

3. Relate and adapt theories, concepts, principles, tools, techniques, and emerging technologies using specialized skills to provide in-depth and creative business solutions to different aspects of accounting, finance and business operations.
4. Critically evaluate\process information from reliable sources and perspective through research & analysis, statistics, and integrations when making decisions.
5. Use technology, analytical tools, and quantitative skills to manipulate data, evaluate, estimate, interpret, and model business problems, functions, and phenomena to solve problems in the dynamic global business environment.
6. Communicate information, ideas, problems, and problems related to accounting, finance, with high degree of proficiency verbally and\or in writing for the intended audience.
7. Demonstrate a capacity to lead a group and\or manage projects showing high ethical standards needed for reporting of financial and accounting information.

Teaching and Learning Methods

9. Constructive Method. Learners must be fully engaged and active in the process of constructing meaning and knowledge based on their prior knowledge and experiences through the process of doing, making, writing, designing, creating, and solving. It allows teachers to implement differentiated learning, authentic assessment practices and incorporate technologies to improve individual learning experiences. It includes simulations, in-course projects, field trips, digital content, group discussions and reflections. This method strives to improve achievement by consciously developing learners' ability to consider ideas, analyze perspectives, solve problems, and make decisions on their own thereby making them more responsible and independent.
10. Inquiry based Method. Learners develop cognitive skills like critical thinking and problem solving by working on questions, problems, or scenarios and formulate creative solutions. The teachers use either structured, guided, or open inquiry to facilitate learning. As a process, learners are involved in their learning by formulating questions, investigating, building their understanding, and creating meaning and new knowledge on a certain lesson. Typical activities include laboratory sessions and research-based activities.
11. Collaborative Method. Learners are divided into small groups to learn something together and capitalize on one's other resources and skills, evaluating one another ideas, and monitoring one another's work. It allows students to actively interact by sharing experiences and take on different roles. Typically, students are provided with problems or projects that they work on together to search for understanding, meaning, or solutions and each group is expected to work together developing or formulating solutions and present the solution in class. The activities include think-pair-share, jigsaw, or round-robin which effectively engage students to complete the tasks.
 - Experiential learning method is the process of learning by doing. By engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. This may include team challenges, simulations, company visits\fieldworks and other extracurricular activities. Experiential learning opportunities exist in a variety of course- and non-course-based forms and may include community service, service-learning, undergraduate research, study abroad, and culminating experiences such as internships, student teaching, and capstone projects.

Assessment Methods

- Assessment is done independently for each course. A variety of assessment tools will be used to assess the achievement of intended learning outcomes including but not limited to exams, assignments, projects, case analysis and presentations. In addition, assessments of learning outcome also include thesis writing, internship, and indirect assessment.



13. Programme Structure

BACHELOR OF SCIENCE IN ACCOUNTING AND FINANCE

CURRICULUM PLAN EFFECTIVE AY2022-2023

FOUNDATION COURSES

| Course Code | Course | Lec | Lab | Units | Pre-Requisites |
|-------------|------------------------|-----|-----|-------|----------------|
| MATH300 | Remedial Mathematics | 3 | 0 | 0 | |
| ENGL301 | Speaking and Listening | 9 | 0 | 0 | |
| ENGL302 | Grammar and Vocabulary | 9 | 0 | 0 | |
| Total Units | | | | 0 | |

FIRST YEAR

FIRST TRIMESTER

| Course Code | Course Title | Lec | Lab | Units | Pre-Requisites |
|-------------|--------------------------------------|-----|-----|-------|----------------|
| ENGL611 | English Communication Skills1 | 3 | 0 | 3 | |
| MATH611 | College Algebra | 3 | 0 | 3 | |
| BSIB626 | Business Organization and Management | 3 | 0 | 3 | |
| COMP613 | Fundamentals of Information Systems | 3 | 0 | 3 | |
| ACC600 | Fundamentals of Accounting | 3 | 0 | 3 | |
| SOCI600 | Sociology | 3 | 0 | 3 | |
| Total Units | | | | 18 | |

SECOND TRIMESTER

| Course Code | Course Title | Lec | Lab | Units | Pre-Requisites |
|-------------|---------------------------------------|-----|-----|-------|----------------|
| MGT604 | Business & Technology 1 | 3 | 0 | 3 | |
| ACC601 | Financial Accounting 1 | 3 | 0 | 3 | ACC600 |
| HIST600 | History of Bahrain and the GCC Region | 3 | 0 | 3 | |
| MGT603 | Organizational Behavior | 3 | 0 | 3 | BSIB626 |
| QM601 | Business Statistics | 3 | 0 | 3 | MATH611 |
| ECO601 | Microeconomics | 3 | 0 | 3 | |
| Total Units | | | | 18 | |

THIRD TRIMESTER

| Course Code | Course Title | Lec | Lab | Units | Pre-Requisites |
|-------------|-------------------------|-----|-----|-------|----------------|
| MGT605 | Business & Technology 2 | 3 | 0 | 3 | MGT604 |
| ACC602 | Financial Accounting 2 | 3 | 0 | 3 | ACC601 |
| ACC603 | Management Accounting 1 | 3 | 0 | 3 | |
| HUMR600 | Human Rights | 3 | 0 | 3 | SOCI600 |
| ARAB600 | Arabic Language | 3 | 0 | 3 | |
| MKT601 | Principles of Marketing | 3 | 0 | 3 | BSIB626 |



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Total Units **18**

SECOND YEAR

FIRST TRIMESTER

| Course Code | Course Title | Lec | Lab | Units | Pre-Requisites |
|--------------------|-----------------------------|-----|-----|-----------|----------------|
| MGT703 | Business & Technology 3 | 3 | 0 | 3 | MGT605 |
| ACC704 | Management Accounting 2 | 3 | 0 | 3 | ACC603 |
| FIN711 | Introduction to FinTech | 3 | 0 | 3 | |
| ENGL701 | Business Communication | 3 | 0 | 3 | ENGL611 |
| COMP721 | Database Management Systems | 2 | 2 | 3 | COMP613 |
| ECO602 | Macroeconomics | 3 | 0 | 3 | ECO601 |
| Total Units | | | | 18 | |

SECOND TRIMESTER

| Course Code | Course Title | Lec | Lab | Units | Pre-Requisites |
|--------------------|----------------------------|-----|-----|-----------|----------------|
| ACC705 | Management Accounting 3 | 3 | 0 | 3 | ACC704 |
| MGT704 | Corporate Business Law 1 | 3 | 0 | 3 | |
| FIN702 | Financial Management 1 | 3 | 0 | 3 | ACC602 |
| QM711 | Data Visualization | 3 | 0 | 3 | QM601 |
| FIN712 | Sustainability for Finance | 3 | 0 | 3 | |
| ECO711 | Money & Banking | 3 | 0 | 3 | ECO602 |
| Total Units | | | | 18 | |

THIRD TRIMESTER

| Course Code | Course Title | Lec | Lab | Units | Pre-Requisites |
|--------------------|----------------------------------|-----|-----|-----------|----------------|
| MGT705 | Corporate Business Law 2 | 3 | 0 | 3 | MGT704 |
| FIN703 | Financial Management 2 | 3 | 0 | 3 | FIN702 |
| ACC707 | Financial Reporting 1 | 3 | 0 | 3 | ACC602 |
| ACC706 | Performance Management 1 | 3 | 0 | 3 | ACC705 |
| FIN713 | Digital Innovation and Finance 1 | 3 | 0 | 3 | FIN711 |
| QM712 | Data Analytics | 3 | 0 | 3 | QM711 |
| Total Units | | | | 18 | |

THIRD YEAR

FIRST TRIMESTER

| Course Code | Course Title | Lec | Lab | Units | Pre-Requisites |
|-------------|----------------------------------|-----|-----|-------|----------------|
| FIN804 | Financial Management 3 | 3 | 0 | 3 | FIN703 |
| ACC807 | Performance Management 2 | 3 | 0 | 3 | ACC706 |
| ACC806 | Financial Reporting 2 | 3 | | 3 | ACC707 |
| FIN814 | International Finance | 3 | 0 | 3 | |
| FIN815 | Digital Innovation and Finance 2 | 3 | 0 | 3 | FIN713 |

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| | | | | | |
|--------------------|-----------------------------|---|---|-----------|--|
| FIN816 | Islamic Banking and Finance | 3 | 0 | 3 | |
| Total Units | | | | 18 | |

SECOND TRIMESTER

| Course Code | Course Title | Lec | Lab | U | Pre-Requisites |
|--------------------|-----------------------------|-----|-----|-----------|-------------------|
| MGT801 | Tax 1 | 3 | 0 | 3 | MGT705 |
| MGT803 | Audit and Assurance 1 | 3 | 0 | 3 | |
| MGT811 | Risk Management & Insurance | 3 | 0 | 3 | |
| QM813 | Data Mining | 3 | 0 | 3 | QM601 |
| Elective 1 | | | | | 3rd Year Standing |
| FIN810 | Personal Finance | 3 | 0 | 3 | |
| FIN811 | Derivative Securities | 3 | 0 | 3 | |
| FIN812 | Real Estate Finance | 3 | 0 | 3 | |
| QM811 | Business Research Methods | 3 | 0 | 3 | QM601 |
| Total Units | | | | 18 | |

THIRD TRIMESTER

| Course Code | Course Title | Lec | Lab | Units | Pre-Requisites |
|--------------------|--|-----|-----|-----------|--------------------------------|
| MGT802 | Tax 2 | 3 | 0 | 3 | MGT801 |
| MGT804 | Audit and Assurance 2 | 3 | 0 | 3 | MGT803 |
| ACC811 | International Financial Reporting Standards (IFRS) | 3 | 0 | 3 | ACC806 |
| QM814 | Business Intelligence | 3 | 0 | 3 | QM813 |
| ACC812 | Internship | 6 | 0 | 6 | Completion of 144 credit hours |
| Total Units | | | | 18 | |

FOURTH YEAR ATTENDANCE

FIRST TRIMESTER

| Course Code | Course Title | Lec | Lab | Units | Pre-Requisites |
|-------------------|---|-----|-----|-------|----------------|
| MGT805 | Tax 3 | 3 | 0 | 3 | MGT802 |
| Elective 2 | | | | | |
| ACC813 | Accounting for Islamic Financial Institutions | 3 | 0 | 3 | |
| ACC814 | Governmental Accounting | 3 | 0 | 3 | |
| ACC815 | Cloud Accounting | 2 | 1 | 3 | |
| MGT812 | Ethics and Professional Skills | 3 | 0 | 3 | |
| Elective 3 | | | | | |
| FIN817 | Computers and Business Information Systems | 2 | 1 | 3 | |
| FIN818 | Financial Planning and Software Applications | 2 | 1 | 3 | |
| FIN819 | Blockchain & Crypto Currencies | 2 | 1 | 3 | |
| PROJ801 | Project | 6 | 0 | 6 | |



Total Units

18

ELECTIVES

| | Domains | Course Code | Course Title (Any three (3) among the following electives) | Units |
|------------|-------------------------|-------------|--|-------|
| Elective 1 | Electives (Finance) | FIN810 | Personal Finance | 3 |
| | | FIN811 | Derivative Securities | 3 |
| | | FIN812 | Real Estate Finance | 3 |
| Elective 2 | Electives (Accounts) | ACC813 | Accounting for Islamic Financial Institutions | 3 |
| | | ACC814 | Governmental Accounting | 3 |
| | | ACC815 | Cloud Accounting | 3 |
| Elective 3 | Electives (Fintech) | FIN817 | Computers and Business Information | 3 |
| | | FIN818 | Financial Planning and Software | 3 |
| | | FIN819 | Blockchain & Crypto Currencies | 3 |

14. Awards and Credits

| | |
|-----------------------------------|--|
| Degree\Certificate Awarded | Bachelor's Degree in Accounting and Finance (BSAF) |
| Total Units for Degree | 180ACS (540 NQF Credits) |
| Total Trimesters Completed | 10 |

15. Admission Criteria

C. For First Year Undergraduate Applicants

Acceptance to the University depends on the following admissions requirements:

1. Completely filled out an admission application form.
2. Minimum secondary school scores 60% or its equivalent.
3. Online Placement test (Oxford Online Placement Test (OOPT)) Result (if needed)
4. Submission of all required documents stated in the Admissions Policy.

To be admitted to BSAF programme, the applicant must satisfy the minimum secondary school grades or its equivalent without the need to take the remediation classes of English and Math, as shown in the following table:

| Subtest Component for Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification | | BSAF |
|---|----------------------------------|----------------------|
| Mathe matics | Science\ Technical\General Track | At least 70% or C |
| | Commercial Track | At least 80% or B |
| | Literature and Islamic Tracks | At least 80% or B |
| Science | | 60 |
| English | | At least 80 or B |





| Subtest Component for Other Qualification (Indian, Pakistan, and West African) | | BSAF |
|---|--------------------------------------|----------------------|
| Mathe matics | Science\ Technical \General Track | At least 51 or C1 |
| | Commercial Track | At least 71 or B1 |
| | Literature and Islamic Tracks | At least 71 or B1 |
| Science | | 60 |
| English | | At least 71 or B1 |

For the undergraduate applicant who did not meet the minimum required secondary school grades in Mathematics and English or its equivalent, his/her admissions depend on the following criteria:

| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|------------------|---|---|---|
| All Programmes | 60-79 % grade in English | Score \geq 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| | Literature and Islamic Tracks | N\A | Foundation Course in Math |
| | Commercial Track: Score 50-79% | N\A | Foundation Course in Math |
| BSAF | For Commercial Track: Score 50-79% in Math For Scientific, General, and technical Track: Score 50-69% in Math | N\A | Foundation Course in Math |
| | For Science score <60% | N\A | Tutorial class in |



| | | | |
|----------------|---|-----|---|
| | | | general sciences |
| All Programmes | CGPA <60% for Bahraini and KSA CGPA <41% for Indian and Pakistan | N\A | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

e. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

f. TOEFL\IELTS

Qualified applicant who attains the score of at least 450 (paper based) or 131.

(computer - based) for TOEFL, or with a score of 5.0 for IELTS, is exempted to sit the required English placement test.

g. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature and Islamic tracks must take the remediation course in Math.

h. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. The 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

B. For Undergraduate Transfer Student Applicants

Application Requirements:

13. Completely filled out an admission application form

14. Official Transcript of Records (TOR) from the university previously attended. Rules and regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school

certificates are to be applied when necessary.

15. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
16. Certificate of Transfer from the university previously attended stamped by MOE, if any.
17. Withdrawal Certificate stamped by MOE
18. Submission of all required documents stated in the admissions policy.

Admissions Requirements:

7. For Bahrain and KSA qualifications, the applicant should have at least a secondary school average of 60%. For non-Bahrain secondary qualifications (Indian and Pakistan) the applicant should have at least 41% secondary school average; and for other non-Bahraini qualifications please refer to the table of cut-off.
8. If the applicant has taken and passed courses in English and Mathematics in the previous university, the applicant will be exempted in taking the remedial courses in both English and Mathematics. The applicant may proceed to mainstream university courses and is eligible to apply for credit transfer.
9. If the applicant has not taken any course in English and Mathematics, the basis for evaluation whether remedial course in English and mathematics is required or not is the subject scores in his/her last year in the secondary school certificate using the table presented earlier.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. Practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or re-admitted student from UTB. The University requires the undergraduate student to complete at least 50% of the required credit units\hours of a programme in residence at UTB. The maximum credit units\hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit units\hours based on his/her original degree from another university.

16. CGPA Requirement for Graduation

The required CGPA for an undergraduate student to be eligible for graduation is 2.0 out of 4.

17. Career Pathways

The BSAF graduates can have work along accounting, auditing, financial controls, investment analysis, risk management, Sharia compliant accounting standards, public practice accounting, tax and regulatory services, compliance services, cost management, corporate management, data analytics, and financial services. In addition, they can pursue postgraduate degrees in MBA and DBA or PhD in Accounting, and obtain professional qualifications such as CIMA, ACCA, CPA, CA, CFA, and CIA.

18. BSAF Curriculum Skills Mapping

| Year\ Level | Course Code | Course Title | Core (C) Option (O) | Programme Intended Learning Outcomes | | | | | | |
|----------------|----------------|-------------------------------|------------------------------|--------------------------------------|----|----|----|----|----|----|
| | | | | P1 | P2 | P3 | P4 | P5 | P6 | P7 |
| Year 1 | ENGL611 | English Communication Skills1 | C | | | | | | | ✓ |



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| | | | | | | | | | | |
|-------------------------------|---------|---------------------------------------|---|---|---|---|---|---|---|---|
| 1st Tri | MATH611 | College Algebra | C | | | | | | ✓ | |
| | BSIB626 | Business Organization and Management | C | | ✓ | | ✓ | | | ✓ |
| | COMP613 | Fundamentals of Information Systems | C | | ✓ | | | ✓ | ✓ | |
| | ACC600 | Fundamentals of Accounting | C | ✓ | | ✓ | ✓ | | ✓ | |
| | SOCI600 | Sociology | C | ✓ | | | | ✓ | | ✓ |
| Year 1 2nd Tri | MGT604 | Business & Technology 1 | C | ✓ | | | | | | |
| | ACC601 | Financial Accounting 1 | C | ✓ | ✓ | ✓ | | | | |
| | HIST600 | History of Bahrain and the GCC Region | C | | | | | | ✓ | ✓ |
| | MGT603 | Organizational Behavior | C | ✓ | ✓ | | | | | |
| | QM601 | Business Statistics | C | | | | ✓ | ✓ | ✓ | ✓ |
| | ECO601 | Microeconomics | C | ✓ | | ✓ | | | ✓ | ✓ |
| Year 1 3rd Tri | MGT605 | Business & Technology 2 | C | ✓ | | | | | | |
| | ACC602 | Financial Accounting 2 | C | ✓ | ✓ | | | | | |
| | ACC603 | Management Accounting 1 | C | | | ✓ | | ✓ | | |
| | HUMR600 | Human Rights | C | | | | | | ✓ | ✓ |
| | ARAB600 | Arabic Language | C | | | | | | ✓ | ✓ |
| | MKT601 | Principles of Marketing | C | ✓ | | | | | | |
| Year 2 1 ST Tri | MGT703 | Business & Technology 3 | C | ✓ | | | | | ✓ | ✓ |
| | ACC704 | Management Accounting 2 | C | ✓ | ✓ | | | | | |
| | FIN711 | Introduction to FinTech | C | ✓ | | | | ✓ | ✓ | ✓ |
| | ENGL701 | Business Communication | C | | | | | | ✓ | ✓ |
| | COMP721 | Database Management Systems | C | | | | | ✓ | ✓ | ✓ |
| | ECO602 | Macroeconomics | C | ✓ | ✓ | | | | ✓ | ✓ |
| Year 2 2 ND Tri | ACC705 | Management Accounting 3 | C | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | MGT704 | Corporate Business Law 1 | C | ✓ | ✓ | | | | ✓ | ✓ |
| | FIN702 | Financial Management 1 | C | | | ✓ | ✓ | | ✓ | ✓ |
| | QM711 | Data Visualization | C | | | | ✓ | ✓ | ✓ | ✓ |
| | FIN712 | Sustainability for Finance | C | | ✓ | | | | ✓ | ✓ |
| | ECO711 | Money & Banking | C | ✓ | | | ✓ | | | |
| Year 2 | MGT705 | Corporate Business Law 2 | C | ✓ | ✓ | | | | ✓ | ✓ |



| | | | | | | | | | | |
|-------------------------------|--------|---|---|---|---|---|---|---|---|---|
| 3 RD Tri | FIN703 | Financial Management 2 | C | | | ✓ | ✓ | | ✓ | ✓ |
| | ACC705 | Financial Reporting 1 | C | | ✓ | | | | ✓ | ✓ |
| | ACC706 | Performance Management 1 | C | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | FIN713 | Digital Innovation and Finance 1 (ACCA Micro accreditation) | C | | ✓ | | | ✓ | ✓ | ✓ |
| | QM712 | Data Analytics (ACCA Micro accreditation) | C | | | | | ✓ | ✓ | ✓ |
| Year 3 1 ST Tri | FIN804 | Financial Management 3 | C | | | ✓ | ✓ | | ✓ | ✓ |
| | ACC807 | Performance Management 2 | C | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | ACC806 | Financial Reporting 2 | C | | ✓ | | | ✓ | ✓ | ✓ |
| | FIN814 | International Finance | C | | ✓ | | ✓ | | ✓ | ✓ |
| | FIN815 | Digital Innovation and Finance 2 | C | | ✓ | | | ✓ | ✓ | ✓ |
| | FIN816 | Islamic Banking and Finance | C | | ✓ | | | | ✓ | ✓ |
| Year 3 2 ND Tri | MGT801 | Tax 1 | C | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | MGT803 | Audit and Assurance 1 | C | ✓ | ✓ | | ✓ | | ✓ | ✓ |
| | MGT811 | Risk Management & Insurance | C | | | ✓ | | ✓ | ✓ | ✓ |
| | QM813 | Data Mining | C | | | ✓ | | ✓ | | |
| | | | | | | | | | | |
| | QM811 | Business Research Methods | C | | ✓ | | | | ✓ | ✓ |
| Year 3 3 RD Tri | MGT802 | Tax 2 | C | | ✓ | ✓ | | | ✓ | ✓ |
| | MGT804 | Audit and Assurance 2 | C | | ✓ | | ✓ | | ✓ | ✓ |
| | ACC811 | International Financial Reporting Standards (IFRS) | C | ✓ | ✓ | | | | ✓ | ✓ |
| | QM814 | Business Intelligence | C | | | ✓ | | ✓ | ✓ | ✓ |
| | ACC812 | Internship | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Year 4 1 ST Tri | MGT805 | Tax 3 | C | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | | | | | | | | | | |
| | MGT812 | Ethics and Professional Skills | C | ✓ | ✓ | | | | ✓ | ✓ |
| | | | | | | | | | | |
| Elective s | | Project | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | FIN817 | Computers and Business Information Systems | O | | | ✓ | | ✓ | ✓ | ✓ |
| | FIN818 | Financial Planning and Software Applications | O | | | ✓ | | ✓ | ✓ | ✓ |
| | FIN819 | Blockchain & Crypto currencies | O | | | ✓ | ✓ | ✓ | ✓ | ✓ |

| | | | | | | | | | |
|--------|---|---|---|---|---|---|---|---|---|
| ACC813 | Accounting for Islamic Financial Institutions | O | ✓ | | | ✓ | | ✓ | ✓ |
| ACC814 | Governmental Accounting | O | ✓ | ✓ | | | | ✓ | ✓ |
| ACC815 | Cloud Accounting | O | | | ✓ | | ✓ | ✓ | ✓ |
| FIN810 | Personal Finance | O | | ✓ | | ✓ | | ✓ | ✓ |
| FIN811 | Derivative Securities | O | | | ✓ | ✓ | | ✓ | ✓ |
| FIN812 | Real Estate finance | O | ✓ | ✓ | | ✓ | | ✓ | ✓ |

BACHELOR OF SCIENCE IN ACCOUNTING AND FINANCE (BSAF)
CURRICULUM PLAN EFFECTIVE AY2022-2023

Course Description

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|---|--------------------------------------|---------|---------|-------|
| ENGL611 | English Communication Skills 1 | 3 | 0 | 3 |
| This is an introductory course in English communication designed to provide comprehensive, up-to-date and relevant instruction in the correct use of grammar. It intends to build up students' confidence in communicating their thoughts, ideas, information and messages through the functions and structures of different words, phrases, clauses, sentences, and paragraphs. In addition, the integration of language skills increases their communicative competence and prepares them for the academic and social challenges in college and beyond. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MATH611 | College Algebra | 3 | 0 | 3 |
| This course is designed to familiarize learners with main theories, principles and concepts of college algebra that are useful in analysis and simplification of basic and some advanced mathematical problems. Content includes functions which are polynomial, rational, exponential, logarithmic, and related equations. Sketching graphs, Matrices, determinants, progressions, and inequalities as applied to engineering. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| BSIB626 | Business Organization and Management | 3 | 0 | 3 |
| This course demonstrates in-depth understanding of the theoretical concepts of business structure, its stakeholders, the external environment and governance and social responsibility of management. Detailed content includes the factors of business for example, micro and macro factors, political, social, technological, competitive and environmental factors, governance and social responsibility of management, business structure, culture and types of business organizations. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| COMP613 | Fundamentals of Information Systems | 3 | 0 | 3 |
| This course focuses on the detailed knowledge on management information systems by establishing a link between business processes and information technology. It includes the topics on decision making frameworks, types of information systems, systems development, networks, IT infrastructure and, social impacts of IT. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| BSAF600 | Fundamentals of Accounting | 3 | 0 | 3 |
| This course deals with detailed knowledge and understanding of the accounting scope and purpose of financial statements for external reporting, users' and stakeholders' needs, the main elements of financial reports, the regulatory framework (legislation and regulation, reasons and limitations, relevance of accounting standards), duties and responsibilities of those charged with governance, the qualitative characteristics of financial information and the use of double-entry accounting system. | | | | |

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|--|---------------------------------------|---------|---------|-------|
| SOCI600 | Sociology | 3 | 0 | 3 |
| This course is designed to expose students in a detailed approach of studying society. It intends to give emphasis on the sociological perspectives, relationships with other social sciences, the main figures in sociological development, including introduction to culture, transformation of societies, importance of socialization, social groups, deviance and social control. Further, it incorporates the discussions on social institutions that enable the college students to understand the economic perspective from ancient to present, the evolution of education and the current viewpoint of family. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MGT605 | Business & Technology 1 | 3 | 0 | 3 |
| This course specifically designed to cover the partial module of ACCA Business & Technology subject. Detail of the topics are as follows: The relationship between accounting and other business functions, Accounting and finance functions within business organisations, Principles of law and regulation governing accounting and auditing, The sources and purpose of internal and external financial information, provided by business, Financial systems, procedures and related IT applications, | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| ACC601 | Financial Accounting 1 | 3 | 0 | 3 |
| This course specifically designed to cover the partial module of ACCA financial accounting. The detail of the topics include the followings: Sales and purchases, Cash, Inventory, Tangible non-current assets, Depreciation, Intangible non-current assets and amortization, Accruals and prepayments, Receivables and payables, Provisions and contingencies, Capital structure and finance costs, Trial balance, Correction of errors, Control accounts and reconciliations, Bank reconciliations and Suspense accounts | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| HIST600 | History of Bahrain and the GCC Region | 3 | 0 | 3 |
| This Course includes the history of the Kingdom of Bahrain and the Arabian Gulf region. It includes the important events in Bahrain and the Arabian Gulf region and their impact on the current situation. It covers the strategic importance of Bahrain, starting with "Ancient civilizations and passing through" the Islamic era, Bahrain's entry into Islam, Portuguese occupation, competition of powers in the 17 th century and the rise of a tribe of Al-Atub. It includes the history of Bahrain under the British protection and the conventions between Bahrain and Great Britain up to British troops leaving the region. It describes the places and persons as well as the historical developments and achievement in Bahrain during the time of Al- Khalifah. It includes independence of Bahrain, issuing of the first constitutional law, reform project by His Majesty King Hamad, constitutional amendments, establishment of GCC, history of Arab Gulf states. It makes the student able to present his patriotic character through historical discussions. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MGT603 | Organizational Behavior | 3 | 0 | 3 |
| The course takes an in-depth look at human behavior in organizations. Incorporating current management theory and research, the course investigates the factors that influence individual and group performance. Topics include perception, personality, attitudes, values, motivation, decision making, leadership, power and politics, conflict and negotiation, groups, and culture. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| QM601 | Business Statistics | 3 | 0 | 3 |
| In this course, the students are introduced to the subject of business statistics to include the need for | | | | |

quantitative analysis in business, the basic procedures in problem solving, and the sources and types of data used by business firms using business application software. Basic probability concepts and normal probability distribution are used by the student to solve real world business problems which involve business applications, Review of probability concepts; Probability functions and distributions; Statistical estimation; Tests of significance; Hypothesis tests of population means, proportions and variances; Analysis of variance; multiple linear regression analysis; Time series analysis.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|----------------|---------|---------|-------|
| ECO601 | Microeconomics | 3 | 0 | 3 |

This course is to develop ways of analyzing the behavior of specific economic units that make up the economic aggregates. The main focuses will be on theories of consumption, production, and cost. The course enables the students to demonstrate in depth understanding of law of demand, law of supply, concept of elasticity, consumer behavior and cost analysis. The course will rely on graphical analysis and numerical calculations. The learners will demonstrate deep understanding of the micro economic principles and its methods as well as tools to understand micro units of economy.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-------------------------|---------|---------|-------|
| MGT605 | Business & Technology 2 | 3 | 0 | 3 |

This course specifically designed to cover the partial module of ACCA Business & Technology subject. Internal controls, authorisation, security of data and compliance within business, Fraud and fraudulent behaviour and their prevention in business, including money laundering, The impact of Financial Technology (Fintech) on accounting systems, Leadership, management and supervision, Recruitment and selection of employees, Individual and group behaviour in business organisations, and Team formation, development and management.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|------------------------|---------|---------|-------|
| ACC602 | Financial Accounting 2 | 3 | 0 | 3 |

This course specifically designed to cover the partial module of ACCA Financial Accounting. Detail of the topics are as follows: Statements of financial position, Statements of profit or loss and other comprehensive income, Disclosure notes, Events after the reporting period, Statements of cash flows, Incomplete records, Subsidiaries, Associates, Importance and purpose of analysis of financial statements, Ratios, and Analysis of financial statements.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-------------------------|---------|---------|-------|
| ACC603 | Management Accounting 1 | 3 | 0 | 3 |

Content of this course is designed as per the applied knowledge of ACCA Managerial accounting Module. Detail of the topics are as follows: Accounting for management, Sources of data, Cost classification, Presenting information, Sampling methods, Forecasting techniques, Summarising and analysing data and Spreadsheets.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------|---------|---------|-------|
| HUMR600 | Human Rights | 3 | 0 | 3 |

This course makes the students able to know the background, main concepts of Human Rights and the philosophical thoughts and Islamic view which contribute to modern Human Rights. It makes them able to analyze what is mentioned in different kinds of Human Rights sources as Universal Declaration of Human Rights, International Covenant on Civil and Political Rights and International Covenant on Economic, Social and Cultural Rights. It deals in the same approach with the National Sources of Human Rights such as the Constitutional Law of Kingdom of Bahrain and National Action Charter with applications as well. The course makes the students able to analyze, discuss and debate Human Rights issues in different ways.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-----------------|---------|---------|-------|
| ARAB600 | Arabic Language | 3 | 0 | 3 |

The course focuses on the fundamentals of Arabic language, such as reading, analyzing, and critique. It explains the characteristics of the required texts, which deal with different literary genres, prose and poetry. The course also focuses on the understanding and application of grammatical rules and basic morphological methods in Arabic, taking into account the correct spelling skills.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-------------------------|---------|---------|-------|
| MKT601 | Principles of Marketing | 3 | 0 | 3 |

The course demonstrates detailed knowledge and understanding of the principles and practices of modern marketing. It emphasizes on the process of planning and executing the conception, pricing, promotion, and distribution of ideas, good, and services that satisfy individual and organizational objectives.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-------------------------|---------|---------|-------|
| MGT703 | Business & Technology 3 | 3 | 0 | 3 |

This course specifically designed to cover the partial module of ACCA Business & Technology subject. Detail of the topics are as follows: Motivating individuals and groups, Learning and training at work, Review and appraisal of individual performance, Fundamental principles of ethical behaviour, The role of regulatory and professional bodies in promoting ethical and professional standards in the accountancy profession, Corporate codes of ethics and Ethical conflicts and dilemmas.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-------------------------|---------|---------|-------|
| ACC704 | Management Accounting 2 | 3 | 0 | 3 |

Content of this course is designed as per the applied knowledge of ACCA Managerial accounting Module. Detail of topics are as follows: Accounting for material, labour, and overheads, Absorption and marginal costing, Cost accounting methods, Alternative cost accounting principles Budgeting, Nature and purpose of budgeting, Budget preparation, Flexible budgets, Capital budgeting and discounted cash flow, Budgetary control and reporting and Behavioural aspects of budgeting

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-------------------------|---------|---------|-------|
| FIN711 | Introduction to FinTech | 3 | 0 | 3 |

In this course will explore the major areas of FinTech including, beginning with What is FinTech before turning to Money, Payment and Emerging Technologies, Digital Finance and Alternative Finance, FinTech Regulation and RegTech, Data and Security, and the Future of Data Driven Finance, as well as, the core technologies driving FinTech including Blockchain, AI and Big Data.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|------------------------|---------|---------|-------|
| ENGL701 | Business Communication | 3 | 0 | 3 |

An overview of effective business communication skills and their direct relationship to workplace success. Emphasis is placed on the planning, organizing, composing, and revising of business documents such as letters, memos, reports, and emails. Presentation skills, professional behavior in the workplace, and current communication technologies are included with an emphasis on real world problem solving. Digital communication topics include presentation software, emails, business-relevant social media, and mobile technologies.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-----------------------------|---------|---------|-------|
| COMP721 | Database Management Systems | 2 | 2 | 3 |

This course provides the core theories principles topics of database management systems. The topics include introduction to the database theory, models, data normalization, data description languages, data manipulation languages and query design. The course covers creating tables, defining integrity and constraints, data manipulation, data selection, joins, nested queries and views.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|---|----------------------------|---------|---------|-------|
| ECO602 | Macroeconomics | 3 | 0 | 3 |
| This course deals in advanced macroeconomic issues focusing on the determination of GDP, unemployment, interest rates, and inflation. The students will have advanced understanding of circular flow, inflation, unemployment, nominal GDP and real GDP, aggregate demand, and aggregate supply. The course builds advanced skills to analyze the macroeconomic policies, such as fiscal and monetary policies. It enables students to apply macroeconomics tools to real world economic policy. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| ACC705 | Management Accounting 3 | 3 | 0 | 3 |
| Content of this course is designed as per the applied knowledge of ACCA Managerial accounting Module. Detail of the topics are as follows: Standard costing system, Variance calculations and analysis, Reconciliation of budgeted and actual profit, Performance measurement-overview, Performance measurement-application, Cost reductions and value enhancement, and Monitoring performance and reporting. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MGT704 | Corporate Business Law 1 | 3 | 0 | 3 |
| This course specifically designed to cover the partial module of ACCA Corporate and Business Law. This course will emphasize on both international and local (Bahrain) law. Detail of the topics are as follows: Law and the legal system, Source of law, Formation of contract, Content of contracts, Breach of contract and remedies, The law of torts and professional negligence, Contract of employment, Dismissal and redundancy, Agency law, Partnerships, Corporations and legal personality and The formation and constitution of a company | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| FIN702 | Financial Management 1 | 3 | 0 | 3 |
| Content of this course is designed as per the applied knowledge of ACCA Financial Management Module. Detail of the topics are as follows: The nature and purpose of financial management, Financial objectives and relationship with corporate strategy, Stakeholders and impact on corporate objectives, Financial and other objectives in not-for-profit organisations, The economic environment for business, The nature and role of financial markets and institutions, The nature and role of money markets, The nature, elements and importance of working capital, Management of inventories, accounts receivable, accounts payable and cash, Determining working capital needs and funding strategies | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| QM711 | Data Visualization | 3 | 0 | 3 |
| This course explores the relationship between information technology and information systems (IS) and their impact on business operations. It covers the cost-benefit analysis of IS, system architecture, data flows, and the importance of privacy and security. Key topics include data visualization, performance management information systems, Transaction Processing Systems (TPS), Management Information Systems (MIS), Customer Relationship Management (CRM), and Big Data. The course focuses on the effective design, implementation, and management of IS to optimize business performance and enhance decision-making processes. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| FIN712 | Sustainability for Finance | 3 | 0 | 3 |
| This course introduces students to sustainable finance. In this course, sustainable finance is understood as the process of ensuring the inclusion of environmental, social, and governance (ESG) considerations into corporate decisions. A sustainable corporation will make their investment decisions that consider not only financial returns but also its social impact. Students will learn the origins, terms, drivers and trends in sustainable finance, major sustainability challenges faced by societies worldwide and how they are being | | | | |



addressed at the international level and local level. As well as students will be able to integrate ESG methodologies and solutions in financial decision making

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-----------------|---------|---------|-------|
| ECO711 | Money & Banking | 3 | 0 | 3 |

The course deals with both theoretical and practical concerns related to today's financial and banking system. It covers money and the financial system, the payment system, financial instruments and financial institutions. The discussion on the roles of the Central Bank and its policies that govern the operations of all financial institutions including the management of the risks. This course will also explore the practical aspects of money and banking within the economy. Emphasis is given to the changing role of financial institutions as well as new financial instruments.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------------------|---------|---------|-------|
| MGT705 | Corporate Business Law 2 | 3 | 0 | 3 |

This course specifically designed to cover the partial module of ACCA Corporate and Business Law. This course will emphasize on both international and local (Bahrain) law. Detail of the topics are as follows: Share capital, Loan capital, Capital maintenance and dividend law, Company directors, Other company officers, Company meetings and resolutions, Insolvency and administration, Fraudulent and criminal behaviour

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|------------------------|---------|---------|-------|
| FIN703 | Financial Management 2 | 3 | 0 | 3 |

Content of this course is designed as per the applied knowledge of ACCA Financial Management Module. Detail of the topics are as follows: Investment appraisal techniques, Allowing for inflation and taxation in DCF, Adjusting for risk and uncertainty in investment appraisal, Specific investment decisions (lease or buy; asset replacement, capital rationing), Sources of, and raising, business finance, Estimating the cost of capital, Sources of finance and their relative costs, Capital structure theories and practical considerations, and Finance for Small and Medium-size Entities (SMEs)

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-----------------------|---------|---------|-------|
| ACC705 | Financial Reporting 1 | 3 | 0 | 3 |

Content of this course is designed as per the applied knowledge of ACCA Financial reporting Module. Detail of the topics are as follows: The need for a conceptual framework and the characteristics of useful information, Recognition and measurement, Regulatory framework, The concepts and principles of groups and consolidated financial statements, Tangible non-current assets, Intangible assets, Impairment of assets, Inventory and biological assets, Financial instruments, and Leasing

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------------------|---------|---------|-------|
| ACC706 | Performance Management 1 | 3 | 0 | 3 |

This course specifically designed to cover the applied knowledge of ACCA performance management Module. Detail of the topics are as follows: Managing information, Sources of information, Information systems and data analytics, Activity-based costing, Target costing, Life-cycle costing, Throughput accounting, Environmental accounting, Relevant cost analysis, Cost volume profit analysis and Limiting factors.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|----------------------------------|---------|---------|-------|
| FIN713 | Digital Innovation and Finance 1 | 3 | 0 | 3 |

Digital Innovation for Finance is aimed at accountancy, finance, business and advisory professionals who wish to develop their knowledge, skills and awareness of innovations in digital technology and its impact on the finance profession. This course provides an opportunity to develop these broader technology skills, with the curriculum aligning closely to key insights from our report - The digital accountant - focusing on emerging technologies, future disruptors and digital transformation.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------|---------|---------|-------|
|-------------|--------------|---------|---------|-------|



| QM712 | Data Analytics | 3 | 0 | 3 |
|--|----------------------------------|---------|---------|-------|
| Data Analytics is aimed at business professionals who wish to develop their understanding of data, and the skills and techniques available for data analytics. Using real practical business examples, learners are able to develop an understanding of how data analytics and data modelling can be used to garner business insights. Learners will learn about big data, the various sources of data, types of analytics, and become familiar with the range of tools and techniques required to extract, manipulate, interpret and present data. They'll also learn about the need to be both sceptical and ethical when working in the data analytics field. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| FIN804 | Financial Management 3 | 3 | 0 | 3 |
| Content of this course is designed as per the applied knowledge of ACCA Financial Management Module. Detail of the topics are as follows: Nature and purpose of the valuation of business and financial assets, Models for the valuation of shares, The valuation of debt and other financial assets, Efficient market hypothesis (EMH) and practical considerations in the valuation of shares, The nature and types of risk and approaches to risk management Causes of exchange rate differences and interest rate fluctuations, Hedging techniques for foreign currency risk, and Hedging techniques for interest rate risk. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| ACC807 | Performance Management 2 | 3 | 0 | 3 |
| This course specifically designed to cover the applied knowledge of ACCA performance management Module. Detail of the topics are as follows: Pricing decisions, Make-or-buy and other short-term decisions, Dealing with risk and uncertainty in decision-making, Budgetary systems and types of budget, Quantitative analysis in budgeting, Standard costing, Material mix and yield variances, Sales mix and quantity variances, Planning and operational variances, Performance analysis in private sector organisations, Divisional performance and transfer pricing, Performance analysis in not-for-profit organisations and the public sector, External considerations and the impact on performance. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| ACC806 | Financial Reporting 2 | 3 | 0 | 3 |
| Content of this course is designed as per the applied knowledge of ACCA Financial reporting Module. Detail of the topics are as follows: Provisions and events after the reporting period, Taxation, Reporting financial performance, Revenue, Government grants, Foreign currency transactions, Limitations of financial statements, Calculation and interpretation of accounting ratios and trends to address users' and stakeholders' needs, Limitation of interpretation techniques, Specialised, not-for-profit, and public sector entities, Preparation of single entity financial statements, and Preparation of consolidated financial statements, including an associate | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| FIN814 | International Finance | 3 | 0 | 3 |
| This course covers issues related to both international financial markets and the financial operations of the firm within the international environment. Management of currency risk and political risk of multinational companies will be discussed. Evaluation of international projects and raising money in global markets along with optimal management of corporate funds internally in differential tax environment will be discussed. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| FIN815 | Digital Innovation and Finance 2 | 3 | 0 | 3 |
| Digital Innovation for Finance is aimed at accountancy, finance, business and advisory professionals who wish to develop their knowledge, skills and awareness of innovations in digital technology and its impact on the finance profession. This course provides an opportunity to develop these broader technology skills, with the curriculum aligning closely to key insights from our report - The digital accountant - focusing on emerging technologies, future disruptors and digital transformation. | | | | |

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|---|-----------------------------|---------|---------|-------|
| FIN816 | Islamic Banking and Finance | 3 | 0 | 3 |
| This course introduces students with economic rationale of Islamic values in Islamic financial system. It covers topics on the core principles and basic models of Islamic finance and establishes a framework for understanding this financial system. It examines how and why Islamic values determine the business climate. It provides a clear framework for analysing the micro- and macro-economic foundations of the Islamic system. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MGT801 | Tax 1 | 3 | 0 | 3 |
| This course specifically designed to cover the partial module of ACCA Tax subject. This course will emphasize on both U.K. and local (Bahrain) Tax system with the blend of international taxation system. Detail of the topics are as follows: The overall function and purpose of taxation in a modern economy, Principal sources of revenue law and practice, The systems for self-assessment and the making of returns, The time limits for the submission of information, claims, and payment of tax, including payments on account, The procedures relating to compliance checks, appeals, and disputes, Penalties for non-compliance, The scope of income tax, Income from employment, Income from self-employment, Property and investment income, The comprehensive computation of taxable income and income tax liability, National insurance contributions for employed and self-employed persons, The use of exemptions and reliefs in deferring and minimising income tax liabilities. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MGT803 | Audit and Assurance 1 | 3 | 0 | 3 |
| This course specifically designed to cover the partial module of ACCA Audit and Assurance subject. Detail of the topics are as follows: The concept of audit and other assurance engagements, External audits, Corporate governance, Professional ethics and ACCA's Code of Ethics and Conduct, Obtaining, accepting, and continuing audit engagements, Objective and general principles, Assessing audit risks, Understanding the entity and its environment Fraud, laws, and regulations, Audit planning and documentation, Internal control systems, The use and evaluation of internal control systems by auditors, Tests of control and Communication on internal control. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MGT811 | Risk Management & Insurance | 3 | 0 | 3 |
| This course develop an understanding of what is risk, and the main structure of risk models and how it can be measured, why it is interested in individuals at risk, and why the companies at risk. The application of the risk management process on two main areas of concern for companies: the risk of liability and financial risks. However the insurance section discusses the fundamental knowledge of insurance comparing, including the required economic theory of insurance corporations, insurance classification scheme, the insurance environment, insurance in risk management, and the main risk factors affecting the insurance companies. In addition, to the legal framework of insurance corporation, and the functions of insurance companies | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| QM813 | Data Mining | 3 | 0 | 3 |
| Advanced data analysis techniques; nature and purpose of Data Mining (DM); the relationship between DM and data warehousing; design issues related to DM tools; data processing techniques; classification and predictions; clustering; DM applications. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| QM811 | Business Research Methods | 3 | 0 | 3 |
| The course covers the core principles and methods applicable in doing a business research in accounting. It helps student to undertake advanced analysis that will give a solution to a business problem or an | | | | |

enhancement in business operations. The course will focus on systematic collection of data and analysis of information that will result to a meaningful business research. The student develops advanced skills of communication, collaboration, and information management.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------|---------|---------|-------|
| MGT802 | Tax 2 | 2 | 2 | 3 |

This course specifically designed to cover the partial module of ACCA Tax subject. This course will emphasize on both U.K. and local (Bahrain) Tax system with the blend of international taxation system. Detail of the topics are as follows: The scope of the taxation of capital gains, The basic principles of computing gains and losses, Gains and losses on the disposal of movable and immovable property, Gains and losses on the disposal of shares and securities, The computation of capital gains tax, The use of exemptions and reliefs in deferring and minimising tax liabilities arising on the disposal of capital assets, The basic principles of computing transfers of value, The liabilities arising on chargeable lifetime transfers and on the death of an individual, The use of exemptions in deferring and minimising inheritance tax liabilities, Payment of inheritance tax, The scope of inheritance tax, and The basic principles of computing transfers of value

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-----------------------|---------|---------|-------|
| MGT804 | Audit and Assurance 2 | | | |

This course specifically designed to cover the partial module of ACCA Audit and Assurance subject. Detail of the topics are as follows: This course specifically designed to cover the partial module of ACCA Audit and Assurance subject. Detail of the topics are as follows: Internal audit and governance and the differences between external audit and internal audit, The scope of the internal audit function, outsourcing and internal audit assignments, Financial statement assertions and audit evidence, Audit procedures, Audit sampling and other means of testing, The audit of specific items, Automated tools and techniques, The work of others, Not-for-profit organisations, Subsequent events, Going concern, Written representations, Audit finalisation and the final review, The Independent Auditor's Report, and The Independent Auditor's Report

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--|---------|---------|-------|
| ACC811 | International Financial Reporting Standards (IFRS) | 3 | 0 | 3 |

This course will deliver the basic knowledge about Introduction to IASB, IAS and IFRS. The IFRS and its Conceptual framework; IAS 1 (revised): presentation of financial statements; IAS 16: property, plant and equipment; IAS 36: Impairment of assets, IAS 41: Agriculture; IAS 18: Revenues (Including IAS11); IFRS 8: Operating segments and IFRS 13: Measurement of fair value. This course will enable students to critically evaluate the financial reports as per the IFRS.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-----------------------|---------|---------|-------|
| QM814 | Business Intelligence | 2 | 2 | 3 |

Business Intelligence (BI) is a set of architectures, theories, methodologies and technologies that transform structured, semi-structured and unstructured data into meaningful and useful information. This course will include the following concepts: Business Intelligence (BI) components; BI technologies; data gathering; storing; accessing and analysis; BI application to the organization; data quality and validity; data privacy and security; data warehousing; analytical reporting; data visualization; ethical and legal issues.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------|---------|---------|-------|
| ACC812 | Internship | 0 | 12 | 6 |

This course helps students to have the opportunity to develop new skills through experiential learning under the direction of a skilled practitioner. The arrangements for the working relationship must be established prior to the assignment.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------|---------|---------|-------|
| MGT805 | Tax 3 | 3 | 0 | 3 |



This course specifically designed to cover the partial module of ACCA Tax subject. This course will emphasize on both U.K. and local (Bahrain) Tax system with the blend of international taxation system. Detail of the topics are as follows: The liabilities arising on chargeable lifetime transfers and on the death of an individual, The use of exemptions in deferring and minimising inheritance tax liabilities, Payment of inheritance tax, The scope of corporation tax, Taxable total profits, Chargeable gains for companies, The comprehensive computation of corporation tax liability, The effect of a group corporate structure for corporation tax purposes, The use of exemptions and reliefs in deferring and minimising corporation tax liabilities, The VAT registration requirements, The computation of VAT liabilities, and The effect of special schemes

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------------------------|---------|---------|-------|
| MGT812 | Ethics and Professional Skills | 3 | 0 | 3 |

This course is designed to provide a strong foundation for professional development of our students to operate in a complex global environment. Students will develop an understanding the importance and contribution of ethical practices in wider organisational contexts. In addition, students will focus on enhancing their inter and intra-personal communication skills. The course adopts a multiple perspectives approach which encourages students to develop these skills. This course will further cover the following topics. In depth analysis and foresight needed to overcome the complex ethical challenges; contemporary and controversial ethical issues facing the business community, morale reasoning, moral dilemmas, equity, justice and fairness, ethical standards and moral development.

Elective Courses

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|------------------|---------|---------|-------|
| FIN810 | Personal Finance | 3 | 0 | 3 |

This course designed to help students understand the impact of individual choices on occupational goals and future earnings potential. Using simulations such as Virtual Business Personal Finance students will experience real world scenarios and use strategies covered in the course to help them make sound financial decisions. Students will design personal and household budgets; simulate use of checking and saving accounts; demonstrate knowledge of finance, debt, and credit management; evaluate and understand insurance and taxes. This course will provide a foundational understanding for making informed personal financial decisions

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-----------------------|---------|---------|-------|
| FIN811 | Derivative Securities | 3 | 0 | 3 |

This module introduces different financial derivative contracts available in the market, develops pricing techniques and risk management tools to manage risks associated with a portfolio of derivative contracts. Outline syllabus includes: An introduction to derivatives, futures and forward, options and trading strategies, binomial tree model, Black-Scholes option pricing formula, Greeks and derivative risk management, numerical techniques, exotic options, interest rate models and interest rate derivatives, credit risk and credit derivatives.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|---------------------|---------|---------|-------|
| FIN812 | Real Estate finance | 3 | 0 | 3 |

This course presents the fundamental concepts of real estate finance. The course provides a framework for understanding the flow of funds into various real estate markets and financing costs can be calculated and evaluated. The course will provide students with practical knowledge of various financing options, their costs and benefits, and provide an introduction to the financial analysis of real estate investments.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|---|---------|---------|-------|
| ACC813 | Accounting for Islamic Financial Institutions | 3 | 0 | 3 |

This course is intended to introduce students to accounting concepts for Islamic financial transaction and responsibility from the Qur'an and Sunnah. The course would show the need for Islamic accounting and the



limitations of conventional accounting. The course will enhance students' opportunity to learn about accounting standards developed by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) and understand the relevant international accounting and reporting standards and their implications for IFIs.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-------------------------|---------|---------|-------|
| ACC814 | Governmental Accounting | 3 | 0 | 3 |

This course covers accounting principles, concepts, and practices in municipal and other governmental units with emphasis on fund accounts. The related budgetary and encumbrance procedures are included. The use of fund and financial accounting principles and practices relative to non-profit hospitals, colleges/universities, and associations receive particular attention.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|------------------|---------|---------|-------|
| ACC815 | Cloud Accounting | 2 | 1 | 3 |

The course provides demonstrates the application of the theory and concepts of accounting and the ways in which accounting is used in a variety of modern economic and business contexts. Students focus on the skills of recording, reporting, presenting, and interpreting financial information using a cloud accounting platform.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--|---------|---------|-------|
| FIN817 | Computers and Business Information Systems | 2 | 1 | 3 |

This course provides an in-depth exploration of the role of computers and information systems in modern business environments. Students will gain foundational knowledge in computer hardware, software applications, networking, and data management while exploring their application to business processes. Topics include information system design, database management, e-commerce technologies, security protocols, and emerging trends in digital business. Through hands-on projects and case studies, students will develop practical skills to analyze, design, and implement information systems to solve real-world business challenges.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--|---------|---------|-------|
| FIN818 | Financial Planning and Software Applications | 2 | 1 | 3 |

This course provides students with essential knowledge and skills of computerized business applications and presents different applications of IS for solving business problems of organizations. Topics covered include: applications of business in accounting, marketing and other business fields such as Accounting Information System (AIS), IT for finance, IT for human resources, and IT for public relations.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------------------------|---------|---------|-------|
| FIN819 | Blockchain & Crypto currencies | 2 | 1 | 3 |

This course covers the core fundamentals of how cryptocurrencies work—who uses them, what level of security they have, and how they are different from traditional hard currencies, as well as how Bitcoin originated and why it is becoming a global phenomenon. The course also provides a broad overview of the essential concepts of blockchain, realities of Cryptocurrency, the intricacies of Blockchain technology, and an effective strategy for incorporating Cryptocurrency into investment plans.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------|---------|---------|-------|
| PROJ801 | Project | 3 | 0 | 3 |

This course emphasizes the stages of designing a graduation project. It gives students the opportunity to engage in a practical activity where they can showcase their ability to apply the knowledge and skills acquired during their academic journey. By the end of the course, students are required to complete a project that has successfully gone through the stages of design, analysis, implementation, testing, and evaluation.

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| | |
|---|--|
| 1. Teaching Institution | University of Technology Bahrain |
| 2. University Department | College of Administrative and Financial Sciences |
| 3. Programme Title | Master of Business Administration (MBA) |
| 4. Title of Final Award | Master of Business Administration (MBA) |
| 5. Mode of Attendance | Actual classroom learning-interactive (Full-time) |
| 6. Delivery Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | NQF Level 9 126 NQF Credits (42 ACS Credits) |
| 8. Accreditation | European Council for Business Education (ECBE) |
| 9. Other external influences | <p>Local External Influence / Reference</p> <ul style="list-style-type: none"> Ministry of Education (MOE) Higher Education Council (HEC) Education and Training Quality Authority (BQA) <p>International External Influence / Reference</p> <p>European Council for Business Education (ECBE)</p> <ul style="list-style-type: none"> QAA-UK Subject Benchmark Statement for MBA AACSB General Business Master's Degree Programmes Bahrain National Qualifications Framework |
| 10. Date of production/ revision of this specification | September, 2021 |
| 11. Aims of the Programme | |
| <p>The programme is a Master of Business Administration (MBA), which provides an advanced business education and a learning experience that incorporates the key business functional areas for the students to become effective managers and leaders of business organizations in a globally competitive and complex business environment.</p> <p>Graduates of the programme three (3) to five (5) years after graduation shall be able to:</p> <ol style="list-style-type: none"> Practice effectively as management professionals by demonstrating competency in the key business functional areas and applying critical thinking, analysis and problem-solving skills to develop, implement, and evaluate solutions in complex business and economic problems requiring interdisciplinary and global perspectives; and Promote high ethical standards and professionalism by evaluating the moral, social, and environmental implications of managerial decisions and understanding the relationship between business organizations and other societal institutions. | |
| 12. Programme Intended Learning Outcomes | |
| <p>Upon successful completion of the programme, the student will be able to:</p> <ol style="list-style-type: none"> Demonstrate critical knowledge and understanding of the key functional areas of business that are needed by a business manager. Critically analyze tools and models using various management techniques that deliver a more efficient | |

strategic decision-making process to solve complex business problems.

3. Initiate, communicate and lead cooperative activities to enhance entrepreneurial skills that address the need of globalization.
4. Demonstrate the expertise required to perform independent research in the field of business and management by applying appropriate methodologies.
5. Pursue life-long learning and promote ethical and professional behavior by taking responsibility for their work.

Teaching and Learning Methods

1. Constructive Method. Learners must be fully engaged and active in the process of constructing meaning and knowledge based on their prior knowledge and experiences through the process of doing, making, writing, designing, creating and solving. It allows teachers to implement differentiated learning, authentic assessment practices and incorporate technologies to improve individual learning experiences. It includes simulations, in-course projects, field trips, digital content, group discussions and reflections. This method strives to improve achievement by consciously developing learners' ability to consider ideas, analyze perspectives, solve problems and make decisions on their own thereby making them more responsible and independent.
2. Inquiry based Method. Learners develop cognitive skills like critical thinking and problem solving by working on questions, problems, or scenarios and formulate creative solutions. The teachers use either structured, guided, or open inquiry to facilitate learning. As a process, learners are involved in their learning by formulating questions, investigating, building their understanding, and creating meaning and new knowledge on a certain lesson. Typically, activities include laboratory sessions and research-based activities.
3. Collaborative Method. Learners are divided into small groups to learn something together and capitalize on one's other resources and skills, evaluating one another ideas, and monitoring one another's work. It allows students to actively interact by sharing experiences and take on different roles. Typically, students are provided with problems or projects that they work on together to search for understanding, meaning, or solutions and each group is expected to work together developing or formulating solutions and present the solution in class. The activities include think-pair-share, jigsaw, or round-robin which effectively engage students to complete the tasks.
4. Experiential learning method is the process of learning by doing. By engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. This may include team challenges, simulations, company visits/fieldworks and other extracurricular activities. Experiential learning opportunities exist in a variety of course- and non-course-based forms and may include community service, service-learning, undergraduate research, study abroad, and culminating experiences such as internships, student teaching, and capstone projects

Assessment Methods

- Assessment is done independently for each course. A variety of assessment tools will be used to assess achievement of intended learning outcomes including but not limited to: tests, exam, assignments, case analysis, presentations, projects and thesis.

13. Programme Structure

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(PRE-MBA)

| Course Code | Course Title | Units |
|--------------------|-----------------------------------|-------------|
| PMBA801 | Introduction to Management | 3 |
| PMBA802 | Quantitative Methods for Business | 3 |
| PMBA803 | Survey of Economics | 3 |
| PMBA804 | Financial Accounting | 3 |
| Total Units | | (12) |

FIRST YEAR**FIRST TRIMESTER**

| Course Code | Course Title | Units |
|--------------------|---------------------------------|-----------|
| CMBA910 | Strategic Management | 3 |
| CMBA912 | Managerial Accounting | 3 |
| CMBA913 | Marketing Management | 3 |
| CMBA914 | Corporate Governance and Ethics | 3 |
| Total Units | | 12 |

SECOND TRIMESTER

| Course Code | Course Title | Units |
|--------------------|---------------------------------|-----------|
| CMBA921 | Human Resource Management | 3 |
| CMBA922 | Managerial Finance | 3 |
| CMBA923 | Innovation and Entrepreneurship | 3 |
| CMBA924 | Management Information Systems | 3 |
| Total Units | | 12 |

THIRD TRIMESTER

Electives (06 Units) - (All First and Second Trimester Courses are pre-requisites to any Elective Courses)

| Course Code | Course Title | Units |
|--------------------|-------------------------------|-----------|
| CMBA931 | Business Research Method | 3 |
| CMBA932 | Statistics and Decision Tools | 3 |
| MBAE933 | Elective 1 | 3 |
| MBAE934 | Elective 2 | 3 |
| Total Units | | 12 |

SECOND YEAR**FIRST TRIMESTER**

(Thesis Writing 06 units)

| Course Code | Course Title | Units |
|--------------------------|--|-----------|
| MBAT999 | Thesis Writing (2 trimester minimum; 3 trimesters maximum) | 6 |
| Total Units | | 6 |
| GRAND TOTAL Units | | 42 |

| List of Elective Courses: <i>choose any two (2)</i> | Units |
|--|--------------|
| Data Mining and Business Analytics | 3 |
| Investment and Portfolio Management | 3 |
| Supply Chain and Logistics Management | 3 |
| Project Management Systems | 3 |
| Organizational Change and Development | 3 |
| Business Law | 3 |
| Managerial Economics | 3 |
| E Business | 3 |

14. Awards and Credits

| | |
|------------------------------------|---|
| Degree/ Certificate Awarded | Master of Business Administration (MBA) |
| Total Units for Degree | 42 |
| Total Trimesters Completed | 5 trimesters |

15. Admission Criteria

C1. Acceptance to the post graduate programmes as a new student depends on the following criteria:

- The applicant should have a bachelor's degree with a minimum CGPA of 2.75 out of 4.00 or 2.00 out of 4.00.
- All Applicants will be interviewed by a panel of two members. Only successful applicants in the interview will be considered for admission. The right to admission to an applicant is left to the judgment of the panel members in cases where the relevant subject matter has not been conclusively demonstrated by the applicant's academic transcript.
- Applicant who is not a graduate of a bachelor's degree not delivered in English, he/she may also present a minimum score of 496 (paper-based) and 169 (computer-based) in TOEFL or 5.5 in IELTS as an equivalent of OOPT.

For MBA:

- An applicant who is a graduate of a bachelor's degree (in any area of business-related course) and has a minimum CGPA of 2.75 out of 4.00 or 2.00 out of 4.00 will be exempt from taking the bridging courses.
- An applicant who is a graduate of a bachelor's degree in a non-business field and is applying and has a minimum 2.00 out of 4.00 will be exempted from taking the bridging courses, provided he/she has

minimum work experience of two years in any management-related field.

- An applicant who is not a graduate of a bachelor's degree not delivered in English, he/she will take the OOPT and should get a passing score of at least 65 to proceed to core courses, but if failed, he/she will proceed to foundation courses.

Acceptance to the postgraduate programme as a transfer student depends on the following criteria:

- UTB requires as a matter of policy that a transfer postgraduate student is required to complete at least 50% of the required credit units/hours of a programme of residence at UTB.
- The maximum credit units/hours that are eligible for transfer credits should not exceed fifty percent (50%) of the required credits from the original degree from another university.
- Capstone (Thesis) course is not eligible for credit transfer; the transfer student must take this course during his/her residency at UTB.

16. CGPA Requirement for Graduation

The required CGPA for a postgraduate student to be eligible for graduation is 3.0 out of 4.

17. Career Pathways

The graduates of the MBA programme can pursue a career as business development manager, business analyst/specialist, HR manager, bank and finance managers, financial advisers, risk and project managers, operations manager or managing their own business as entrepreneurs. In addition, the programme can lead graduates for postgraduate degrees in business and management such as PhD or DBA.

18. CURRICULUM SKILLS MAPPING

| | | Programme Learning Outcomes | | | | | |
|--|---------------------------------------|-----------------------------|----|----|----|----|----|
| Course Code | Course Title | Core (C) Elective (E) | P1 | P2 | P3 | P4 | P5 |
| CORE COURSES and CILO MAPPING TO PILO | | | | | | | |
| CMBA910 | Strategic Management | C | √ | √ | | √ | √ |
| CMBA912 | Managerial Accounting | C | √ | √ | √ | √ | |
| CMBA913 | Marketing Management | C | √ | √ | √ | √ | √ |
| CMBA914 | Corporate Governance and Ethics | C | √ | √ | √ | √ | √ |
| CMBA921 | Human Resource Management | C | √ | √ | √ | √ | √ |
| CMBA922 | Managerial Finance | C | √ | √ | √ | √ | |
| CMBA923 | Innovation and Entrepreneurship | C | √ | √ | √ | √ | √ |
| CMBA924 | Management Information Systems | C | √ | √ | √ | √ | √ |
| CMBA931 | Business Research Method | C | √ | √ | | | √ |
| CMBA932 | Statistics and Decision Tools | C | √ | √ | √ | √ | |
| ELECTIVE COURSES: (ANY TWO) | | | | | | | |
| | Data Mining and Business Analytics | E | √ | √ | | √ | √ |
| | Investment and Portfolio Management | E | √ | √ | √ | √ | √ |
| | Supply Chain and Logistics Management | E | √ | √ | | | √ |
| | Project Management Systems | E | √ | √ | √ | √ | |

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| | | | | | | | |
|----------------------|--|---|---|---|---|---|---|
| | Organizational Change and Development | E | √ | √ | √ | √ | √ |
| | Managerial Economics | E | √ | √ | √ | √ | |
| | Business Law | E | √ | √ | | | √ |
| | E- Business | E | √ | √ | | | √ |
| THESIS COURSE | | | | | | | |
| MBAT999 | Thesis Writing (to be completed in two trimesters minimum, maximum three Trimesters) | C | √ | √ | √ | √ | √ |

MASTER OF BUSINESS ADMINISTRATION CURRICULUM PLAN EFFECTIVE AY2021-2022

COURSE DESCRIPTION

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|--|-----------------------------------|----------|---------|-------|
| PMBA801 | Introduction to Management | 3 | 0 | 3 |
| This course deals with the study of principles and foundations of management and organizations. The course covers management activities when dealing with strategic management and decision-making process, the leadership theories and provides knowledge on how to handle business environments to gain competitive advantages. It also provides awareness on the importance of team building in management environment and skills that managers need to identify and define situations, issues/or problems for a successful business environment. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| PMBA802 | Quantitative Methods for Business | 3 | 0 | 3 |
| The course focuses on advanced analytical methods that help executives make sound decision for complex business problems. The course presents the application of quantitative mathematical modelling to decision making in a business management context. Topics include relations of managers and numbers, calculations and equation, quadratic equations, collecting and summarizing data, and solving management problems involving uncertainty specifically with the application of network models, assignment method, and inventory models. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| PMBA803 | Survey of Economics | 3 | 0 | 3 |
| This course covers survey of both micro and macroeconomic concepts. Microeconomics topics include scarcity, positive and normative economics, economic problem, demand and supply mechanism, elasticity and market structure. Macroeconomics topics include national accounts, unemployment, business cycles, inflation, money, banking and monetary and fiscal policies. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| PMBA804 | Financial Accounting | 3 | 0 | 3 |
| This course deals with the study of the theoretical accounting framework objectives of financial statements, accounting conventions, and generally accepted accounting principles relating to the preparation and presentation of financial statements for the benefit of the various users of financial statements. It covers valuation of the asset, liability, and owners' equity accounts. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| CMBA910 | Strategic Management | 3 | 0 | 3 |

This course critically analyzes, evaluates and/or synthesizes drivers of effective, innovative and sustainable business strategy in organizations in a context that are often complex and not aligned. It includes critical evaluation of the strategic management processes which are long-term managerial decisions and actions that shape the organization's pursuit of competitive advantage. It covers the concepts and processes underlying environmental scanning, strategy formulation, implementation, and control.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|-----------------------|---------|---------|-------|
| CMBA912 | Managerial Accounting | 3 | 0 | 3 |

This course emphasizes on use of financial and accounting data as a management tool for managerial control and decision making process. It covers perspective of how accounting and financial statements information is used as a tool by the management in carrying out its functions particularly on planning, controlling and in all aspects of decision-making.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|----------------------|---------|---------|-------|
| CMBA913 | Marketing Management | 3 | 0 | 3 |

This course critically analyzes the role of comprehensive marketing plan within an organization. It focuses on the design and integration on the new marketing trends and communication of the marketing process related to key decision-making. It covers how product, price, place and promotions contribute to the marketing mix, customer value satisfaction, the international market, marketing research and marketing of service-oriented and non-profit entities. It also includes the discussion of issues affecting marketing in variable contexts that are often complex and unpredictable.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|---------------------------------|---------|---------|-------|
| CMBA914 | Corporate Governance and Ethics | 3 | 0 | 3 |

The course provides critical understanding of the legal and ethical aspects of corporate governance. The course develops the abstract thinking ability of the students while dealing on issues related to ethical behavior and corporate governance. The topics include principles of corporate governance, corporate culture, ethical behavior, the role of the board and senior executives and assessing their performance, and the audit function among others.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|---------------------------|---------|---------|-------|
| CMBA921 | Human Resource Management | 3 | 0 | 3 |

This course critically examines the functions and roles of human resource management (HRM) in complex organizations. It investigates the process of managing people from a strategic perspective covering important areas on human resource acquisition, training and development, performance and compensation management, and labor relations. It enables students to design a strategic HRM program.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------------|---------|---------|-------|
| CMBA922 | Managerial Finance | 3 | 0 | 3 |

The course knowledge and understanding of the financial models, theories and concepts of financial management. It builds the essential analytical skills of the managers of the firm and investors using financial tools and techniques. It covers financial statement analysis, discounted cash flows, valuation of equity and bond, capital budgeting techniques and the risk and return on investments.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|---------------------------------|---------|---------|-------|
| CMBA923 | Innovation and Entrepreneurship | 3 | 0 | 3 |

This course provides practical insights and solid foundation of entrepreneurship and hands-on experience in applying creativity and innovation in new ventures. The course will prepare students for the kinds of technically-linked business challenges that are inherent to situations where "the answer" (a technical innovation) is being developed in parallel with "the problem" (a market need).

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--------------|---------|---------|-------|
|-------------|--------------|---------|---------|-------|

| CMBA924 | Management Information Systems | 3 | 0 | 3 |
|--|--------------------------------|---------|---------|-------|
| The course integrates with the current Information Systems concepts and technologies. Students will learn how information systems could be used effectively at different levels of management for the purpose of decision making process. The course will cover concepts on how information system give a business or organization a competitive edge by providing technologies that help managers plan, organize, control, and lead. Includes topics such as information systems components, decision support system, e-business concepts and implementation, enterprise resource planning and common information systems used today. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| CMBA931 | Business Research Methods | 3 | 0 | 3 |
| This course focuses on research methods and tools used by decision makers in organizations. It presents the critical knowledge of research intent and design, methodology and technique, data management and analysis informed by commonly used statistical methods. It provides analytical approaches that can be applied to practical issues. The course would enable students to develop and present a research proposal. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| CMBA932 | Statistics and Decision Tools | 3 | 0 | 3 |
| This course focuses on statistical methods and tools used by decision makers in organizations. This course introduces the topics involving descriptive statistics, sample size determination and hypothesis testing, as well as measuring and predicting relationships. The course should enable students to develop an understanding of the application and interpretation of basic data analysis techniques with an emphasis on statistical applications. | | | | |

ELECTIVE COURSES

| Course Title | Lec Hrs | Lab Hrs | Units |
|---|----------|---------|-------|
| Data Mining and Business Analytics | 3 | 0 | 3 |
| In this course the students will learn the state-of-the-art techniques applied in data science for mining, analysis, visualization and interpretation of data. Both statistical and machine-learning based techniques will be taught with emphasis on the application of programmable solutions, visualization, interpretation and communication of the results obtained from the application of such techniques. In addition, the students will understand the uncertainty hidden in their results due to the probabilistic nature of the statistical and machine-learning techniques. | | | |
| Course Title | Lec Hrs. | Lab Hrs | Units |
| Investment and Portfolio Management | 3 | 0 | 3 |
| The course aims to provide an understanding of the principles and theories relevant to the process of building investment portfolios. The course covers practical applications as well as theoretical material. The course considers mean-variance portfolio theory, linear asset pricing models such as the capital asset pricing model (CAPM) and arbitrage pricing theory (APT), market efficiency, portfolio management, and fund performance. | | | |
| Course Title | Lec Hrs. | Lab Hrs | Units |
| Supply Chain Management and Logistics Management | 3 | 0 | 3 |
| This course demonstrates critical knowledge and understanding of modeling and solution techniques for planning and executing logistics and supply chain management decisions. It uses optimization and simulation techniques to extend the understanding of planning, organizing, operating, and controlling the supply chain operations. It brings together the principles of logistics management to deliver cost-effective customer service through the integration of transportation, inventory management, and materials handling. It examines inbound and outbound logistics, inventory management, warehousing, transportation systems, and logistics network design concepts. | | | |

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| Course Title | | Lec Hrs. | Lab Hrs | Units |
|--|---|----------|---------|-------|
| Project Management | | 3 | 0 | 3 |
| This course provides students with the modern project management foundations, technical skills, behavioral competence and strategic awareness required of a project manager. It covers project strategy and organization, project organization and culture, leadership, managing project teams, outsourcing, monitoring progress leading to a successful project closure. | | | | |
| Course Title | | Lec Hrs | Lab Hrs | Units |
| Organizational Change and Development | | 3 | 0 | 3 |
| This course deals with the advance strategic principles and functions of management and the different skills that managers need for a successful business. It also includes the leadership patterns in the managerial hierarchy together with the internal and external forces of an organizational change and development. It also covers the analysis of organizational development and change management practice and evaluation of the relevance and implications for leading sustainable change in business. In the end, the course equips the students the necessary abilities and competencies to create and design an OD intervention. | | | | |
| Course Title | | Lec Hrs | Lab Hrs | Units |
| Business Law | | 3 | 0 | 3 |
| This course is designed to help students analyze the legal environment in which business operates. Topics include a general overview of the nature of business law and its relationship to business ethics, laws on business organizations, law on contracts, and negotiable instruments law. This course enables students to draft and formulate legal contracts and commercial papers. | | | | |
| Course Title | | Lec Hrs | Lab Hrs | Units |
| E- Business | | 3 | 0 | 3 |
| This course deals with the advanced electronic business and describes information technologies and web services that improve the productivity of a business. The course includes examples of best practices and real world examples. In addition, the course covers the basics of electronic business, forms of electronic commerce, electronic data interchange, electronic payment systems, electronic business options and opportunities, electronic business security concerns, and legal and ethical issues. | | | | |
| Course Title | | Lec Hrs | Lab Hrs | Units |
| Managerial Economics | | 3 | 0 | 3 |
| This course is about exposing the students to a rigorous foundation in microeconomics and industrial organization. It aims to develop students’ capacity to analyze the economic environments in which business entities operate and understand how managerial decisions can vary under different constraints that each economic environment places on a manager’s pursuit of its goals. Its focus will be on analyzing the functioning of markets, the economic behavior of firms and other economic agents and their economic/social implications. | | | | |
| THESIS COURSE | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MBAT999 | Thesis Writing (Minimum 2 trimesters Maximum3 trimesters) | 6 | 0 | 6 |
| This thesis course allows students to conduct a deep and thoughtful investigation of developments and strategies of complex global business environment that is properly grounded on scientific methodologies. The thesis, including its defense and submission, is a required component of the MBA programme. | | | | |

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|---|---|
| 1. Teaching Institution | University of Technology Bahrain (UTB) |
| 2. University Department | College of Administrative and Financial Sciences (CAFS) |
| 3. Programme Title | Master of Science in Digital Marketing (MSDM) |
| 4. Title of Final Award | Master of Science in Digital Marketing (MSDM) |
| 5. Mode of Attendance | Actual classroom learning-interactive (Full-Time) |
| 6. Delivery Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | NQF Level 9 108 NQF Credits (36 ACS Credits) |
| 8. Accreditation | European Council for Business Education (ECBE) Chartered Institute of Marketing (CIM) |
| 9. Other external influences | Local External Influence / Reference <ul style="list-style-type: none"> - Ministry of Education (MOE) - Higher Education Council (HEC) - Bahrain Education and Training Quality Authority (BQA) International External Influence / Reference <ul style="list-style-type: none"> - AACSB Specialized Master's Degree Programmes - Chartered Institute of Marketing (CIM) |
| 10. Date of production/revision of this specification | September 2024 |
| 11. Aims of the Programme | |
| <p>The Master of Science in Digital Marketing equips students and professionals with the knowledge and practical skills of digital marketing essentials and to specialize in planning and applying digital marketing strategies and solutions, combining user-centred, creative, media and marketing communications with strategic marketing, analysis and management.</p> <p>Graduates of the programme three (3) to five (5) years after graduation shall be able to:</p> <ol style="list-style-type: none"> Practice effectively as marketing professionals by demonstrating competency in the field of digital marketing, and apply critical thinking, analysis, and problem-solving skills to develop, implement, and provide solutions for complex marketing problems; and Promote high ethical standards and professionalism by evaluating the social and environmental implications of marketing decisions and understanding the relationship between business organizations and other societal institutions. | |
| 12. Programme Intended Learning Outcomes | |
| <p>Upon successful completion of the programme, the student will be able to:</p> <ol style="list-style-type: none"> Demonstrate advanced knowledge and understanding of the concepts of digital marketing needed by business and organizations. Critically analyze business scenarios to provide solutions to marketing problems that help in efficient decision-making process. Relate and adapt the concepts, models, functions, and tools of digital marketing in uncertain | |

competition.

9. Exhibit the expertise required to perform independent or group research in the field of digital marketing by applying appropriate methodologies.
10. Initiate ethical strategic decisions in unpredictable and complex market situations.

Teaching and Learning Methods

5. Constructive Method. Learners must be fully engaged and active in the process of constructing meaning and knowledge based on their prior knowledge and experiences through the process of doing, making, writing, designing, creating and solving. It allows teachers to implement differentiated learning, authentic assessment practices and incorporate technologies to improve individual learning experiences. It includes simulations, in-course projects, field trips, digital content, group discussions and reflections. This method strives to improve achievement by consciously developing learners' ability to consider ideas, analyze perspectives, solve problems and make decisions on their own thereby making them more responsible and independent.
6. Inquiry based Method. Learners develop cognitive skills like critical thinking and problem solving by working on questions, problems, or scenarios and formulate creative solutions. The teachers use either structured, guided, or open inquiry to facilitate learning. As a process, learners are involved in their learning by formulating questions, investigating, building their understanding, and creating meaning and new knowledge on a certain lesson. Typically, activities include laboratory sessions and research-based activities.
7. Collaborative Method. Learners are divided into small groups to learn something together and capitalize on one's other resources and skills, evaluating one another ideas, and monitoring one another's work. It allows students to actively interact by sharing experiences and take on different roles. Typically, students are provided with problems or projects that they work on together to search for understanding, meaning, or solutions and each group is expected to work together developing or formulating solutions and present the solution in class. The activities include think-pair-share, jigsaw, or round-robin which effectively engage students to complete the tasks.
8. Experiential learning method is the process of learning by doing. By engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. This may include team challenges, simulations, company visits/fieldworks and other extracurricular activities. Experiential learning opportunities exist in a variety of course- and non-course-based forms and may include community service, service-learning, graduate research on the field of digital marketing, and culminating experiences such as writing a thesis on this field.

Assessment Methods

- Assessment is done independently for each course. A variety of assessment tools will be used to assess achievement of intended learning outcomes including but not limited to: exams, assignments, case analysis, presentations, projects and thesis.

13. Programme Structure
**MASTER OF SCIENCE IN DIGITAL MARKETING
CURRICULUM PLAN AY2024-2025**
FIRST TRIMESTER

| Course Code | Course Title | Units |
|--------------------|---|-----------|
| MKT911 | Digital Customer Experience | 3 |
| MKT912 | Social Media and Content Marketing | 3 |
| MKT913 | Multi – Platform Marketing Communications | 3 |
| MKT914 | Digital Marketing Strategy | 3 |
| Total Units | | 12 |

SECOND TRIMESTER

| Course Code | Course Title | Units |
|--------------------|----------------------------------|-----------|
| MKT921 | Consumer Psychology and Research | 3 |
| MKT922 | Digital Marketing Analytics | 3 |
| MKT923 | Digital Marketing and Innovation | 3 |
| RES911 | Research Methods for Business | 3 |
| Total Units | | 12 |

THIRD TRIMESTER

| Course Code | Course Title | Units |
|--------------------|--------------|----------|
| MKTE931 | Elective 1 | 3 |
| MKTE932 | Elective 2 | 3 |
| Total Units | | 6 |

FOURTH TRIMESTER

| Course Code | Course Title | Units |
|--------------------|----------------|----------|
| MKT999 | Thesis Writing | 6 |
| Total Units | | 6 |

TOTAL UNITS: 36**Note: MKT999 Thesis Writing Course will require a minimum of two trimesters to complete.****Elective Courses: (Students are expected to choose any 2 courses from the Electives offered)**

| Course Code | Course Title | Units |
|-------------|-------------------------------|-------|
| MKT931 | Advertising Management | 3 |
| MKT932 | Managing Big Data | 3 |
| MKT933 | Consumer Behavior | 3 |
| MKT934 | Brand Creation and Management | 3 |



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| Course Code | Course Title | Units |
|-------------|---|-------|
| MKT935 | Innovation and Entrepreneurship | 3 |
| MKT936 | Ethical and Sustainable Business Practice | 3 |

14. Awards and Credits

Degree/ Certificate Awarded Master of Science in Digital Marketing

Total Units for Degree 36

Total Trimesters Completed 4 trimesters

15. Admission Criteria

Acceptance to the post graduate programmes as a new student depends on the following criteria:

- The applicant should have a bachelor's degree with a minimum CGPA of 2.75 out of 1.00 or 2.00 out of 4.00.
- All Applicants will be interviewed by a panel of two members. Only successful applicants in the interview will be considered for admission. The right to admission to an applicant is left to the judgment of the panel members in cases where the relevant subject matter has not been conclusively demonstrated by the applicant's academic transcript.
- Applicant who is not a graduate of a bachelor's degree not delivered in English, he/she may also present a minimum score of 496 (paper-based) and 169 (computer-based) in TOEFL or 5.5 in IELTS as an equivalent of OOPT.

For MSDM:

- An applicant who is a graduate of any bachelor's degree other than business with a CGPA of 2.75 out of 1.00 or 2.00 out of 4.00 or must have a minimum work experience of one-year post-bachelor's degree in the specialized domain of the degree he is applying for.
- An applicant who has a bachelor's degree in business programme that was not delivered in English, he/she will take OOPT and should get a passing score of at least 65 to enroll in the programme.

Acceptance to the postgraduate programme as a transfer student depends on the following criteria:

- UTB requires as a matter of policy that a transfer postgraduate student is required to complete at least 50% of the required credit units/hours of a programme of residence at UTB.
- The maximum credit units/hours that are eligible for transfer credits should not exceed fifty percent (50%) of the required credits from the original degree from another university.
- Capstone (Thesis) course is not eligible for credit transfer; the transfer student must take this course during his/her residency at UTB.

16. CGPA Requirement for Graduation

The required CGPA for an postgraduate student to be eligible for graduation is 3.0 out of 4.

17. Career Pathways

Graduates of the Master's in Digital Marketing programme can pursue a career as digital marketing



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manager, SEO/SEM specialist, social media strategist, content marketing manager, e-commerce manager, brand manager, digital advertising specialist, or data-driven marketing analyst. Additionally, graduates can work as consultants, helping businesses grow their digital presence, or manage their own digital marketing agencies. The programme also provides a pathway for further academic qualifications such as a PhD or DBA in marketing, business, or related fields.

18. Curriculum Skills Map

| | | Programme Learning Outcomes | | | | | |
|-----------------------------|---|-----------------------------|----|----|----|----|----|
| Course Code | Course Title | Core (C) Elective (E) | P1 | P2 | P3 | P4 | P5 |
| CILO MAPPING TO PILO | | | | | | | |
| MKT911 | Digital Customer Experience | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT912 | Social Media and Content Marketing | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT913 | Multi – Platform Marketing Communications | C | ✓ | ✓ | ✓ | ✓ | |
| MKT914 | Digital Marketing Strategy | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT921 | Consumer Psychology and Research | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT922 | Digital Marketing Analytics | C | ✓ | ✓ | ✓ | ✓ | |
| MKT923 | Digital Marketing and Innovation | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| RES911 | Research Method for Business | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT999 | Thesis Writing | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| ELECTIVES | | | | | | | |
| MKT931 | Advertising Management | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT932 | Managing Big Data | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT933 | Consumer Behavior | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT934 | Brand Creation and Management | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT935 | Innovation and Entrepreneurship | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| MKT936 | Ethical and Sustainable Business Practice | E | ✓ | ✓ | ✓ | ✓ | ✓ |

| | | |
|--|---------------------|-----------|
|  University of Technology Bahrain | Doc. No. | QR-AAD-01 |
| | Revision No. | 01 |
| | Date of Effectivity | 01-09-23 |
| College: College of Administrative and Financial Sciences | | |
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**MASTER OF SCIENCE IN DIGITAL MARKETING
CURRICULUM PLAN EFFECTIVE AY2023-2024**

COURSE DESCRIPTION

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|---|---|----------|---------|-------|
| MKT911 | Digital Customer Experience | 3 | 0 | 3 |
| This course introduces digital marketing and approaches such opportunities and challenges from a multidisciplinary perspective, involving marketing, psychology, and human-computer interaction. It deals with the study of customer journeys which are characterized by increased use of a range digital technologies, across multiple media. It also attempts to refocuses marketer's attention to the digitalization as the emphasis is on the role of digital components in transforming the customer experience. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| MKT912 | Social Media and Content Marketing | 3 | 0 | 3 |
| This course focuses on the creation of optimized content for social media and content marketing. This includes engaging audiences and incentivizing conversion, taking into account paid or organic search strategies. Students are expected to demonstrate awareness of the ethical implications of social media marketing. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| MKT913 | Multi-Platform Marketing Communications | 3 | 0 | 3 |
| This course focuses on the latest marketing communication practices, known as integrated marketing communications (IMC), featuring an overview of the major media, including broadcast, print, outdoor, point of purchase, direct mail, Internet, telemarketing, public relations, and promotion. The emphasis is on how to analyze and create an IMC program by using the latest value-based IMC concepts and measuring "return on communications investment." | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| MKT914 | Digital Marketing Strategy | 3 | 0 | 3 |
| The course investigates the strategic approach of digital marketing within the business environment. It builds on the understanding of digital marketing context, differences in consumers behaviors and examines how digital marketing analysis, strategies and plans can be developed and implemented in a digital business. The course is focused on innovative changes in communication and engagement with customers in a digital environment and how it affects the development of the digital marketing presence, plan, and strategy. A computer-based simulation will be used to aid the development of relevant skills and knowledge | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| MKT921 | Consumer Psychology and Research | 3 | 0 | 3 |
| The course draws on psychology, sociology, and economics. Students will be exploring the theoretical underpinnings of consumer behavior and apply these learnings, especially in the context of greater consumer choice, the changing face of technology, media, shopping channels, and globalization. Students will also learn the fundamentals of primary and secondary research to aid better understanding of consumers and the market and apply this to marketing communications decision – making. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| MKT922 | Digital Marketing Analytics | 3 | 0 | 3 |
| This course is designed to prepare you for understanding e-Commerce and design user-centered websites and understanding audience behavior and engagement through web analytics. It introduces agile production methodologies, search marketing, authoring/design tools, optimization (including mobile marketing) and testing. Students will be exposed on the use web analytics to understand the audience, acquisition, behavior, | | | | |



and conversions to optimize content for a website through web analytics.

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|---|----------------------------------|----------|---------|-------|
| MKT923 | Digital Marketing and Innovation | 3 | 0 | 3 |
| This course introduces the contemporary digital marketing environment. A range of innovative and disruptive approaches to digital marketing communications are considered in the contemporary business environment in a sustainable business context. Students are expected to be engaged with material actively as a community of practice through classroom and online engagement, considering strategic, tactical, and ethical perspectives and applying these to a range of contexts. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| RES911 | Research Methods for Business | 3 | 0 | 3 |
| This course equips students with the skills to develop and undertake a research dissertation. It provides the theoretical and practical preparation for business research. The course covers the necessary skills and requirements for a literature review, qualitative and quantitative methods, and a research proposal in addition to the pragmatics of ethics and project management. Peer review, skill development workshops and practice exercises are the key learning strategies. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| MKT931 | Advertisement Management | 3 | 0 | 3 |
| The course offers a balance of both academic and practical learning, giving you the opportunity to put your knowledge into practice within genuine business situations. You'll explore the latest developments in marketing management, both in theory and in practice, making sure you graduate with up-to-date knowledge that will make an impact on employers. The course allows students to gain specialist knowledge in marketing management and communications, with a focus on advertising and branding. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| MKT932 | Managing Big Data | 3 | 0 | 3 |
| This course emphasizes the coordination, management, and usage of data utilizing contemporary computer database management systems and is designed for students with experience in statistical analysis, experimental design, and fundamental systems design. This course develops the pragmatics of managing data together with information retrieval and analysis by stressing the dependable, scalable, distributed, and efficient handling of data of any size. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| MKT933 | Consumer Behavior | 3 | 0 | 3 |
| The course introduces the fundamental concepts, principles and theories of consumer behavior and relates them to the practice of marketing. Drawing on both psychological and sociological viewpoints, this course covers individual factors, such as motivation and needs, perception, learning, personality and lifestyle attitudes and external socio-cultural factors such as family, social groups and group processes, social class, culture, and subculture in the context of consumption. This prepares students for making informed decisions about how to manage and respond to the needs and wants of consumers including economics. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| MKT934 | Brand Creation and Management | 3 | 0 | 3 |



Marketers have started to utilize branding to improve how well customers understand their products by forging many associations in the customers' minds between the brand and the product, which they then use as a factor in their decision-making. Therefore, the development and management of brands as valuable assets in providing value to customers are the main topics of this course. In order for students to make and assess branding decisions in the future, it gives a complete understanding of models of brand development and management and contains real-world branding examples.

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|-------------|---------------------------------|----------|---------|-------|
| MKT935 | Innovation and Entrepreneurship | 3 | 0 | 3 |

This course explores the entrepreneurial process through which new ideas become the basis for viable enterprises. This course lays the foundation for sustainability-led innovation and its relation to Bahrain vision 2030 and delves into the process of innovation commencing from sources of innovation, finding resources, developing, and growing the venture. The course provides a combination of theoretical and hands-on learning through case studies from leading companies around the globe.

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|-------------|---|----------|---------|-------|
| MKT936 | Ethical and Sustainable Business Practice | 3 | 0 | 3 |

The effects of business activities are under growing scrutiny from a variety of stakeholders in a connected global corporate world. Managers are under more pressure to strike a balance between immediate and long-term needs for sustainability in the economy, society, and environment. Business professionals who complete this course will have the necessary skills to manage and lead organizations more sustainably and ethically. The course attempts to include ethical leadership, stakeholder management, professional ethics, and corporate social and environmental responsibility.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|----------------|---------|---------|-------|
| MKT999 | Thesis Writing | 6 | 0 | 6 |

The thesis writing is the culmination of the Masters' programme. Much of the learning on the course takes place as students need to complete a thesis / dissertation or negotiate either a project (consultancy project or creative project) addressing a defined business problem. All the options provided above require students to review the literature and to design and carry out primary research to gain insights into the problem prior to defining and developing the solution. This flexible approach to assessment is intended to provide a range of options, reflecting students' diverse strengths and educational backgrounds.



College: College of Administrative and Financial Sciences

MSLSCM PROGRAMME SPECIFICATIONS AY2024-2025

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| | |
|---|---|
| 1. Teaching Institution | University of Technology Bahrain |
| 2. University Department | College of Administrative and Financial Sciences (CAFS) |
| 3. Programme Title | Master of Science in Logistics and Supply Chain Management (MSLSCM) |
| 4. Title of Final Award | Master of Science in Logistics and Supply Chain Management (MSLSCM) |
| 5. Modes of Attendance offered | Actual classroom learning-interactive (Full Time) |
| 6. National Qualification Framework Level and Credit | NQF Level 9 108 NQF Credits (36 ACS Credits) |
| 7. Accreditation | None |
| 8. Other external influences | Local External Influence / Reference <ul style="list-style-type: none"> Ministry of Education (MOE), Higher Education Council (HEC) Education and Training Quality Authority (BQA) International External Influence / Reference <ul style="list-style-type: none"> AACSB Specialized master's degree Programmes Chartered Institute of logistics and Transport (CILT) |
| 9. Date of production/revision of this specification | September 2024 |
| 10. Aims of the Programme | |
| <p>The Master of Science in Logistics and Supply Chain Management provides the tools and techniques necessary to develop effective and efficient supply chains which deliver higher levels of value for the end user and facilitate sustainable business growth. This programme will provide the current theory and research, seeing how this informs practice, and develop innovative solutions to real-life logistics and supply chain problems.</p> <p>Graduates of the programme three (3) to five (5) years after graduation shall be able to:</p> <ol style="list-style-type: none"> Practice effectively as professional by demonstrating, competency in the field of logistics and supply chains and apply critical thinking and problem-solving skills to develop, implement and evaluate solutions in complex logistics and supply chain situation; and Promote high ethical standards and professionalism by evaluating the social and environmental implication of logistics and supply chain decision. | |
| 11. Programme Intended Learning Outcomes | |
| <p>Upon successful completion of the programme, the student will be able to:</p> <ol style="list-style-type: none"> Demonstrate advanced knowledge and understanding of core concepts, theories, and principles in the field of logistics and supply chain management. Apply advanced analytical skills, tools and techniques necessary to design effective supply chain operations. Critically analyze the risks and strategies needed in global supply networks in developing innovative solutions to real-life logistics and supply chain problems. Effectively Communicate and Work on real life case study, large scale logistics problem, or active research project in companies individually or in group Initiate ethical strategic decision in dealing with logistics and supply chain management situations. | |

Teaching and Learning Methods

1. Constructive Method. Learners must be fully engaged and active in the process of constructing meaning and knowledge based on their prior knowledge and experiences through the process of doing, making, writing, designing, creating and solving. It allows teachers to implement differentiated learning, authentic assessment practices and incorporate technologies to improve individual learning experiences. It includes simulations, in-course projects, field trips, digital content, group discussions and reflections. This method strives to improve achievement by consciously developing learners' ability to consider ideas, analyze perspectives, solve problems and make decisions on their own thereby making them more responsible and independent.
2. Inquiry based Method. Learners develop cognitive skills like critical thinking and problem solving by working on questions, problems, or scenarios and formulate creative solutions. The teachers use either structured, guided, or open inquiry to facilitate learning. As a process, learners are involved in their learning by formulating questions, investigating, building their understanding, and creating meaning and new knowledge on a certain lesson. Typically, activities include laboratory sessions and research-based activities.
3. Collaborative Method. Learners are divided into small groups to learn something together and capitalize on one's other resources and skills, evaluating one another ideas, and monitoring one another's work. It allows students to actively interact by sharing experiences and take on different roles. Typically, students are provided with problems or projects that they work on together to search for understanding, meaning, or solutions and each group is expected to work together developing or formulating solutions and present the solution in class. The activities include think-pair-share, jigsaw, or round-robin which effectively engage students to complete the tasks.
4. Experiential learning method is the process of learning by doing. By engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. This may include team challenges, simulations, company visits/fieldworks and other extracurricular activities. Experiential learning opportunities exist in a variety of course- and non-course-based forms and may include community service, service-learning, graduate research on the field of digital marketing, and culminating experiences such as writing a thesis on this field.

Assessment Methods

- Assessment is done independently for each course. A variety of assessment tools will be used to assess achievement of intended learning outcomes including but not limited to: exams, assignments, case analysis, presentations, projects and thesis.

12. Programme Structure

**MASTER OF SCIENCE IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT
CURRICULUM PLAN SY2023-2024**

FIRST TRIMESTER

| Course Code | Course Title | Units |
|--------------------|--|-----------|
| PM911 | Principle of Logistics and Supply Chain Management | 3 |
| PM912 | Supply Chain Risk Management | 3 |
| PM913 | Green and Sustainable Logistics | 3 |
| PM914 | Introduction to Big Data for Supply Chain Management | 3 |
| Total Units | | 12 |

SECOND TRIMESTER

| Course Code | Course Title | Units |
|--------------------|------------------------------------|-----------|
| PM921 | Supply Chain Strategy and Design | 3 |
| PM922 | Big Data Analytics | 3 |
| PM923 | Maritime Transportation Management | 3 |
| RES911 | Research Methods for Business | 3 |
| Total Units | | 12 |

THIRD TRIMESTER

| Course Code | Course Title | Units |
|--------------------|--------------|----------|
| PME931 | Elective 1 | 3 |
| PME932 | Elective 2 | 3 |
| Total Units | | 6 |

FOURTH TRIMESTER

| Course Code | Course Title | Units |
|--------------------|----------------|----------|
| PM999 | Thesis Writing | 6 |
| Total Units | | 6 |

TOTAL UNITS: 36

Note: PM999 Thesis Writing Course will require a minimum of two trimesters to complete.

Elective Courses: (Students are expected to choose any 2 courses from the Electives offered)

| Course Code | Course Title | Units |
|-------------|--|-------|
| PM931 | Strategic Supply Chain and Artificial intelligence | 3 |
| PM932 | Logistics Cyber Security Compliance | 3 |
| PM933 | Supply Chain Modeling and Analytics Techniques | 3 |
| PM934 | Project Management | 3 |

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MSLSCM PROGRAMME SPECIFICATIONS AY2024-2025

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| | | |
|-------|--|---|
| PM935 | Retail Logistics and Supply Chain Management | 3 |
| PM936 | Ethics and Sustainability | 3 |

13. Awards and Credits

| | |
|------------------------------------|--|
| Degree/ Certificate Awarded | Master of Science in Logistics and Supply Chain Management |
|------------------------------------|--|

| | |
|-------------------------------|----|
| Total Units for Degree | 36 |
|-------------------------------|----|

| | |
|-----------------------------------|--------------|
| Total Trimesters Completed | 4 trimesters |
|-----------------------------------|--------------|

14. Admission Criteria

Acceptance to the post graduate programmes as a new student depends on the following criteria:

- d. The applicant should have a bachelor's degree with a minimum CGPA of 2.75 out of 1.00 or 2.00 out of 4.00.
- e. All Applicants will be interviewed by a panel of two members. Only successful applicants in the interview will be considered for admission. The right to admission to an applicant is left to the judgment of the panel members in cases where the relevant subject matter has not been conclusively demonstrated by the applicant's academic transcript.
- f. Applicant who is not a graduate of a bachelor's degree not delivered in English, he/she may also present a minimum score of 496 (paper-based) and 169 (computer-based) in TOEFL or 5.5 in IELTS as an equivalent of OOPT.

For MSLSCM:

- An applicant who is a graduate of any bachelor's degree other than business with a CGPA of 2.75 out of 1.00 or 2.00 out of 4.00 or must have minimum work experience of one-year post-bachelor's degree in the specialized domain of the degree he is applying for.
- An applicant who has a bachelor's degree in business programme that was not delivered in English, he/she will take OOPT and should get a passing score of at least 65 to enroll in the programme.

Acceptance to the postgraduate programme as a transfer student depends on the following criteria:

- d. UTB requires as a matter of policy that a transfer postgraduate student is required to complete at least 50% of the required credit units/hours of a programme of residence at UTB.
- e. The maximum credit units/hours that are eligible for transfer credits should not exceed fifty percent (50%) of the required credits from the original degree from another university.
 - Capstone (Thesis) course is not eligible for credit transfer; the transfer student must take this course during his/her residency at UTB.

15. CGPA Requirement for Graduation

The required CGPA for a postgraduate student to be eligible for graduation is 3.0 out of 4.

16. Career Pathways

Graduates of the (MSLSCM) programme can pursue careers as supply chain managers, logistics coordinators, procurement managers, operations managers, inventory control specialists, transportation managers, warehouse managers, and demand planners. They may also work as consultants in supply chain optimization or lead sustainability initiatives within supply chain processes. Additionally, the programme opens pathways to leadership roles in industries such as manufacturing, retail, and distribution or pursuing further academic qualifications like a PhD or DBA in supply chain management or related fields.

17. Curriculum Skills Map

| | | Programme Learning Outcomes | | | | | |
|-----------------------------|--|-----------------------------|-------|-------|-------|-------|-------|
| Course Code | Course Title | Core (C) Elective (E) | PILO1 | PILO2 | PILO3 | PILO4 | PILO5 |
| CILO MAPPING TO PILO | | | | | | | |
| PM911 | Principle of Logistics and Supply Chain Management | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| PM912 | Supply Chain Risk Management | C | ✓ | ✓ | ✓ | ✓ | |
| PM913 | Green and Sustainable Logistics | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| PM914 | Introduction to Big Data for Supply Chain Management | C | ✓ | ✓ | ✓ | ✓ | |
| PM921 | Supply Chain Strategy and Design | C | ✓ | ✓ | ✓ | ✓ | |
| PM922 | Big Data Analytics | C | ✓ | ✓ | ✓ | ✓ | |
| PM923 | Maritime Transportation Management | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| RES911 | Research Methods for Business | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| PM999 | Thesis Writing | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| | ELECTIVES | | | | | | |
| PM931 | Strategic Supply Chain and Artificial Intelligence | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| PM932 | Logistics Cyber Security Compliance | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| PM933 | Supply Chain Modeling and Analytics Techniques | E | ✓ | ✓ | ✓ | ✓ | |
| PM934 | Project Management | E | ✓ | ✓ | ✓ | ✓ | |

College: College of Administrative and Financial Sciences

MSLSCM PROGRAMME SPECIFICATIONS AY2024-2025

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| | | | | | | | |
|-------|--|---|---|---|---|---|---|
| PM935 | Retail Logistics and Supply Chain Management | E | ✓ | ✓ | ✓ | ✓ | |
| PM936 | Ethics and Sustainability | E | ✓ | ✓ | ✓ | ✓ | ✓ |

**MASTER OF SCIENCE IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT
CURRICULUM PLAN EFFECTIVE 2024-2025**

COURSE DESCRIPTION

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|--|--|----------|---------|-------|
| PM911 | Principle of Logistics and supply chain Management | 3 | 0 | 3 |
| This course explores the Introduction to the field of logistics and supply chain management. Includes development of logistics systems, careers in logistics, distribution planning, supply chain security, and customer service. Also includes roles and functions of purchasing, inventory control, physical distribution, warehousing, transportation methods, packaging, and customs. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| PM912 | Supply Chain Risk Management | 3 | 0 | 3 |
| This course aims to give you an in-depth understanding of the fundamental principles of contemporary supply chain sustainability, resilience, and risk within a business context. This course provides a better understanding of key logistics and supply chain challenges and issues, with a focus on social, economic, and environmental considerations and environmental policies. It will help to understand how key stakeholders operate, regulate, decide, and function in the real world. It will identify priorities, reflect, and conceptualize green supply chain management / sustainable supply chain management together with risk and risk-resilience concepts in the context of business continuity against the key priorities of environment, economy, safety, public health, social inclusion, accessibility and integration. | | | | |
| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
| PM913 | Green Logistics Management | 3 | 0 | 3 |
| This course deals with environmental logistics and refers to sustainable policies and measures focusing on lowering the impact logistics has on the environment. This includes the configuration of processes, structures, systems, and equipment used in the transportation, distribution, and warehousing of goods. Despite logistics not being known for a high level of sustainability as an industry, green logistics aim to gauge the carbon footprint of logistics operations, lower air, soil, sound, and water pollution, and use raw materials sensibly. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| PM914 | Introduction To Big Data for Supply Chain Management | 3 | 0 | 3 |
| This course is designed to explain the big data in logistics and the topics include collection, processing, and analysis of complex datasets related to logistics management operations. Further topics like use sensors, GPS devices, RFID tags, and enterprise resource planning (ERP) systems, data-driven business model and big data supply chain analytics will be taught. The course will help students to gain knowledge in areas such as monitoring of inventory levels, track shipments, identify potential disruptions, supply chain agility and responsiveness, predict equipment failures and maintenance needs, reduce downtime, increase equipment utilization, and extend the lifespan of assets. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| PM921 | Supply Chain Strategy and Design | 3 | 0 | 3 |

This course delivers advanced knowledge of the strategy and design of supply chains. IT will discuss global case studies and learn how to apply supply chain design principles and explore approaches to supplier relationship management, procurement and customer service strategies.

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|-------------|--------------------|----------|---------|-------|
| PM922 | Big Data Analytics | 3 | 0 | 3 |

This course aims to provide students with the new possibilities opened by the digital revolution and how these can be translated into the field of logistics and supply chain management. You will be exposed to several data analytic techniques, including data cleaning, data visualization, and dashboard development (using software) with a focus on application to global logistics and sustainability. More specifically the module will cover aspects such as, using Data Analytics in understanding the big data landscape; Data Processing; Data Visualization: telling a story; Analytical Tools: Descriptive, Predictive, Prescriptive and Cognitive; and Simulation/Network Analysis.

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|-------------|------------------------------------|----------|---------|-------|
| PM923 | Maritime Transportation Management | 3 | 0 | 3 |

This course explores Maritime transport (or ocean transport) or more generally waterborne transport, is the transport of people (passengers) or goods (cargo) via water ways. The Marine Transport Industry is defined as a system that ensures the successful movement of cargoes from one point to another through water modes, where their relative importance and economic value are greater. Logistics is that part of supply chain process that plans, implement and controls the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption in order to meet consumer's requirement. Thus, maritime transport and logistics is the hub of transporting goods across international lines. Therefore, a nation's economy and its viability depend mostly on the maritime transport sector.

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|-------------|-------------------------------|----------|---------|-------|
| RES911 | Research Methods for Business | 3 | 0 | 3 |

This course equips students with the skills to develop and undertake a research dissertation. It provides the theoretical and practical preparation for business research. The course covers the necessary skills and requirements for a literature review, qualitative and quantitative methods, and a research proposal in addition to the pragmatics of ethics and project management. Peer review, skill development workshops and practice exercises are the key learning strategies.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|----------------|---------|---------|-------|
| PM999 | Thesis Writing | 6 | 0 | 6 |

The thesis writing is the culmination of the Masters' programme. Much of the learning on the course takes place as students need to complete a thesis / dissertation or negotiate either a project (consultancy project or creative project) addressing a defined business problem. All the options provided above require students to review the literature and to design and carry out primary research to gain insights into the problem prior to defining and developing the solution. This flexible approach to assessment is intended to provide a range of options, reflecting students' diverse strengths and educational backgrounds.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--|---------|---------|-------|
| PM931 | Strategic Supply Chain and Artificial Intelligence | 3 | 0 | 3 |

This course will provide the students with the prevalent techniques of Artificial Intelligence (AI) that are applied in logistics and supply chain management (SCM). Further the course will cover topics on the use of AI to formulate strategies in SCM and help students to know the use of potential AI techniques that can be employed in SCM. The course also will deal on how disruptive technologies such as Artificial Intelligence (AI), blockchain and the Internet of Things (IoT), might affect the logistics sector and transform supply chains in the future.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|------------------------------------|---------|---------|-------|
| PM932 | Logistics Cybersecurity Compliance | 3 | 0 | 3 |

This course is designed to provide critical understanding of the current cyber security and data protection of logistics and supply chain. It will identify Introduction to cyber security and data protection fundamentals, Understanding the risks and impacts of threats, Key cyber security challenges in the logistics industry with case studies, Strategies for protecting business continuity and adopting solutions

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|-------------|---|----------|---------|-------|
| PM933 | Supply Chain Modelling and Analytics techniques | 3 | 0 | 3 |

The course is designed in two parts. **Supply chain modelling:** This part aims to formulate key activities of the supply chain while emphasizing both the need for formulation and implementation. These include Networks and Routing Transportation models, Resource Allocation and Production Scheduling models, Inventory management models, Quality control models, and Project Management. **Analytics Techniques:** This part demonstrate how analytics techniques, such as Forecasting, Regression, Descriptive analytics, Probability and Decision Analysis and Optimization, can be applied to improve supply chains' efficiency and effectiveness by enabling data-driven decisions at strategic, operational and tactical levels.

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|-------------|--------------------|----------|---------|-------|
| PM934 | Project Management | 3 | 0 | 3 |

This course will provide details on the role of a project and project manager in logistics, supply chain and operations management, and the concepts and techniques required to manage the core aspects of a project. The main topics covered include fundamental theories, knowledge, and techniques required to manage projects in contemporary logistics, supply chain and operational setting. Drawing on contemporary project management research and business case studies on logistics, supply chain and operations, this course will develop your knowledge, skills, and confidence in managing projects in a global logistics and supply chain environment.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|--|---------|---------|-------|
| PM935 | Retail Logistics and Supply Chain Management | 3 | 0 | 3 |

This course aims to give you an in-depth knowledge about retail organizations using SCM to control inventory levels, product quality, expenses, and timing. The course covers supply chain strategy that differentiates delivery terms and service offerings which are vital for optimizing the customer service and balance of cost with a focus on retail logistics and supply chain management.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|---------------------------|---------|---------|-------|
| PM936 | Ethics and sustainability | 3 | 0 | 3 |

This course deals with immediate and long-term needs for sustainability in the economy, society, and environment. Business professionals who complete this course will have the necessary skills to manage and lead organizations more sustainably and ethically. The course will include ethical leadership, stakeholder management, professional ethics, and corporate social and environmental responsibility.

College: College of Administrative and Financial Sciences

MSRI PROGRAMME SPECIFICATIONS AY2025-2026

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| | |
|---|--|
| 1. Teaching Institution | University of Technology Bahrain |
| 2. University Department | College of Administrative and Financial Sciences |
| 3. Programme Title | Master of Science in Real Estate Management and Investment (MSRI) |
| 4. Title of Final Award | Master of Science in Real Estate Management and Investment (MSRI) |
| 5. Mode of Attendance | Actual classroom learning-interactive (Full-time) |
| 6. Delivery Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | NQF Level 9 126 NQF Credits (42 ACS Credits) |
| 8. Accreditation | None |
| 9. Other external influences | Local External Influence / Reference <ul style="list-style-type: none"> Ministry of Education (MOE) Higher Education Council (HEC) Education and Training Quality Authority (BQA) International External Influence / Reference <ul style="list-style-type: none"> Royal Institute of Chartered Surveyors (RICS) AACSB Standards European Council for Business Education (ECBE) QAA-UK Master's Degree Subject Benchmark Statements |
| 10. Date of production of this specification | September, 2025 |
| 11. Aims of the Programme | |
| <p>The MSc in Real Estate Management and Investment is a postgraduate programme designed to prepare students for professional roles in the property industry. It provides advanced theoretical knowledge in key areas such as property valuation, investment analysis, asset management, and sustainable urban development. The programme equips students with the ability to critically analyze complex real estate issues using advanced research and analytical methods, make informed and ethical decisions in dynamic environments, and apply strategic judgment in professional practice. Aligned with professional standards, the programme also enhances students' communication, digital, and interpersonal skills, enabling them to work effectively in multidisciplinary and global contexts while upholding principles of social responsibility and sustainability.</p> <p>Programme Educational Objectives:</p> <ol style="list-style-type: none"> Demonstrate advanced, integrated expertise in real estate market dynamics, legal and regulatory frameworks, and effectively apply critical analysis, valuation, and appraisal techniques in addressing complex challenges across diverse economic, social, and environmental conditions. Exhibit specialized professional competence in property valuation, investment analysis, and asset management, applying practical skills and strategic thinking to solve real-world problems with sound professional judgment and a strong commitment to ethical standards in real estate practice. Contribute to the advancement of the real estate profession, by engaging in continuous learning, leadership roles, and multidisciplinary collaboration that supports sustainable urban development and responsible property investment. | |

12. Programme Intended Learning Outcomes

Upon successful completion of the programme, the student will be able to:

11. Demonstrate advanced understanding of legal, regulatory, and contractual frameworks in real estate, including valuation, planning, sustainability, and asset management.
12. Critically assess and apply data, methods, and tools to support informed decisions in property valuation, management, and investment.
13. Apply and adapt principles of valuation, investment, and property management to varied and complex real estate scenarios.
14. Utilize advanced analytical tools from related markets to evaluate and manage real estate assets and investments.
15. Demonstrate ethical, specialized knowledge and independent thinking in a chosen area of real estate informed by current trends and research.

Teaching and Learning Methods**9. Constructive Method**

Learners actively construct advanced knowledge by engaging in designing, modeling, valuing, writing, and solving real estate-related problems. This method draws on their prior knowledge and professional experiences to deepen understanding through differentiated learning, authentic assessments, and the integration of digital technologies. Activities include in-course projects, simulations, site visits, case analyses, group discussions, and reflective exercises that foster independence, strategic thinking, and informed decision-making.

10. Inquiry-Based Method

Learners develop higher-order thinking and research skills by investigating complex questions or real-world scenarios in the real estate domain. Through structured, guided, or open inquiry, students formulate problems, gather data, analyze property-related issues, and create innovative solutions. Activities include laboratory simulations, investment feasibility analyses, planning case studies, and project-based learning tasks designed to support critical inquiry and evidence-based judgment.

11. Collaborative Method

Learners engage in group-based learning to solve property management and investment challenges by leveraging diverse skills, perspectives, and professional experiences. Working in small groups, students critically discuss market cases, co-develop valuation models, and present shared solutions to complex scenarios. Techniques such as think-pair-share, jigsaw, and round-robin encourage cooperative problem-solving, accountability, and interpersonal communication—key competencies at the postgraduate level.

12. Experiential Learning Method

Students learn through hands-on, real-world engagement by applying theoretical concepts in professional real estate contexts. This includes simulations, team-based field assignments, site analyses, industry guest sessions, and capstone projects. Experiential learning may take the form of graduate research, community-based projects, or service-learning linked to real estate development, investment strategies, and urban planning—promoting autonomy, innovation, and critical evaluation in practical environments.

Assessment Methods

Assessment is done independently for each course. A variety of assessment tools will be used to assess the achievement of intended learning outcomes including but not limited to: exams, assignments, case analysis, presentations and research projects.

13. Programme Structure

MASTER OF SCIENCE IN REAL ESTATE MANAGEMENT AND INVESTMENT
CURRICULUM PLAN EFFECTIVE AY2025-2026

FIRST YEAR**FIRST TRIMESTER**

| Course Code | Course Title | Units |
|--------------------|---|-----------|
| MSRI911 | Real Estate Valuation | 3 |
| MSRI912 | Building Economics | 3 |
| MSRI913 | Real Estate Law and Administration | 3 |
| MSRI914 | Property Market Investment and Finance Analysis | 3 |
| Total Units | | 12 |

SECOND TRIMESTER

| Course Code | Course Title | Units |
|--------------------|--|-----------|
| MSRI921 | Property Asset Management | 3 |
| MSRI922 | Sustainable Urban Property Development | 3 |
| MSRI923 | Real Estate Marketing Management | 3 |
| MSRI924 | Business Research and Statistics | 3 |
| Total Units | | 12 |

THIRD TRIMESTER

(All First and Second Trimester Courses are pre-requisites to any Elective Courses)

| Course Code | Course Title | Units |
|--------------------|--------------|----------|
| MSRIXXX | Elective 1 | 3 |
| MSRIXXX | Elective 2 | 3 |
| Total Units | | 6 |

SECOND YEAR**FIRST TRIMESTER**

| Course Code | Course Title | Units |
|--|--|--------------|
| MSRI999 | Research Project (2 trimester minimum to complete) | 12 |
| Total Units | | 12 |
| GRAND TOTAL Units | | 42 |
| List of Elective Courses: <i>choose any two (2)</i> | | Units |

| | | |
|---------|--------------------------------------|---|
| MSRI931 | Project Management of Urban Planning | 3 |
| MSRI932 | Managing Big Data | 3 |
| MSRI933 | Corporate Finance | 3 |
| MSRI934 | Innovation and Entrepreneurship | 3 |
| MSRI935 | Islamic Commercial Jurisprudence | 3 |

14. Awards and Credits

| | |
|------------------------------------|--|
| Degree/ Certificate Awarded | Master of Science in Real Estate Management and Investment |
|------------------------------------|--|

| | |
|-------------------------------|----|
| Total Units for Degree | 42 |
|-------------------------------|----|

| | |
|-----------------------------------|--------------|
| Total Trimesters Completed | 5 trimesters |
|-----------------------------------|--------------|

15. Admission Criteria

Graduate Applicants: Acceptance to the graduate programme as a new student depends on the following criteria:

- a. The Applicant should have a bachelor's degree with a minimum CGPA of 2.75 out of 4.00 or 2.00 out of 4.00.
- a. For an applicant who is a graduate of any baccalaureate degree other than business with a CGPA of 2.00 out of 4.00 or must have a minimum work experience of one year post his baccalaureate degree in the specialized domain of the degree he is applying for.
- b. For an applicant who has a baccalaureate degree in a business programme that was not delivered in English, he/she will take OOPT and should get a passing score of at least 65 to enroll in the programme. The applicant may also present a minimum score of 496 (paper-based) and 169 (computer-based) in TOEFL or 5.5 in IELTS as an equivalent of OOPT.
- c. All Applicants will be interviewed by a panel of two members. Only successful applicants in the interview will be considered for admission. The right to admission to an applicant is left to the judgement of the panel members in case where the relevant subject matter has not been conclusively demonstrated by the applicant's academic transcript.

Acceptance to the postgraduate programme as a transfer student depends on the following criteria:

- d. UTB requires as a matter of policy that a transfer postgraduate student is required to complete at least 50% of the required credit units/hours of a programme of residence at UTB.
- e. The maximum credit units/hours that are eligible for transfer credits should not exceed fifty percent (50%) of the required credits from the original degree from another university.
- f. Capstone (Thesis) course is not eligible for credit transfer; the transfer student must take this course during his/her residency at UTB.

16. CGPA Requirement for Graduation

The required CGPA for a postgraduate student to be eligible for graduation is 3.0 out of 4.

17. Career Pathways

Completing an MSc in Real Estate Management & Investment can qualify you for a variety of roles in both Government and Private sectors, such as: Real Estate Investment Analyst, Property Valuation Consultant, Urban Development Advisor, Real Estate Portfolio Manager, Housing Policy Officer or RERA Specialist, Commercial Property Strategist and Real Estate Broker.

18. CURRICULUM SKILLS MAPPING

| | | Programme Learning Outcomes | | | | | |
|--|---|-----------------------------|----|----|----|----|----|
| Course Code | Course Title | Core (C) Elective (E) | P1 | P2 | P3 | P4 | P5 |
| CORE COURSES and CILO MAPPING TO PILO | | | | | | | |
| MSRI911 | Real Estate Valuation | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI912 | Building Economics | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI913 | Real Estate Law and Administration | C | ✓ | ✓ | ✓ | ✓ | |
| MSRI914 | Property Market Investment and Finance Analysis | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI921 | Property Asset Management | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI922 | Sustainable Urban Property Development | C | ✓ | ✓ | ✓ | ✓ | |
| MSRI923 | Real Estate Marketing Management | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI924 | Business Research and Statistics | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI999 | Research Project | C | ✓ | ✓ | ✓ | ✓ | ✓ |
| ELECTIVE COURSES: (ANY TWO) | | | | | | | |
| MSRI931 | Project Management of Urban Planning | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI932 | Managing Big Data | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI933 | Corporate Finance | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI934 | Innovation and Entrepreneurship | E | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSRI935 | Islamic Commercial Jurisprudence | E | ✓ | ✓ | ✓ | ✓ | ✓ |

COURSE DESCRIPTION

| Course Code | Course Title | Lec Hrs. | Lab Hrs | Units |
|---|-----------------------|----------|---------|-------|
| MSRI911 | Real Estate Valuation | 3 | 0 | 3 |
| <p>In real estate valuation, analysis, and market insights shape property decisions. This module introduces you to the key concepts behind real estate valuation, helping you understand how valuations are carried out, the various methods used, and when to apply them. You will explore the five main valuation methods (the comparative method, investment methods, residual, profits and contractors' methods), gaining the skills to assess property value accurately. will also learn about the professional standards set by the Royal Institution of Chartered Surveyors (RICS), including ethical considerations and environmental, social and governance (ESG) issues in valuation.</p> | | | | |

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|---|---|---------|---------|-------|
| MSRI912 | Building Economics | 3 | 0 | 3 |
| <p>This module is designed to provide you with a comprehensive understanding of the macroeconomic factors that influence the construction industry and the innovative practices that drive its growth and sustainability. You'll start by exploring the macroeconomic overview of the national economy, focusing on the five significant components: banks, households, government, firms, and the external sector. You'll learn how each of these components plays a crucial role in ensuring economic growth. However, the focus will be on the firm which is described as the construction industry in this module. You'll explore the role of the construction industry in driving other components of the macroeconomy. Additionally, you will delve into economic models of urban location and growth, learning about urban land economics and the theories that support urban development. You will examine the economic challenges that arise from construction activities in urban areas, providing you with insights into the economic aspects of urban problems caused by the construction industry. Furthermore, you'll explore the innovative practices adopted by construction firms to overcome urban economic challenges. You'll learn about balancing cost and value in construction projects, covering principles such as developers' budgets, whole-life costing, cost geometry, and value management.</p> | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MSRI913 | Real Estate Law and Administration | 3 | 0 | 3 |
| <p>This course introduces students to the legal and administrative frameworks governing real estate within the Kingdom of Bahrain, with comparative reference to selected GCC jurisdictions and international standards. Core topics include land and property rights, tenancy and lease regulation, development control, contract and construction law, and real estate dispute mechanisms. Emphasis is placed on the interpretation and application of Bahraini statutes, while integrating insights from regional practices and international professional guidelines relevant to real estate transactions and investment.</p> | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MSRI914 | Property Market Investment and Finance Analysis | 3 | 0 | 3 |
| <p>The module is designed to equip students with skills for the analysis of property investments and investment markets (of which property is a part) and the ability to apply rigorous analytical tools to inform investment decisions. Students are introduced to investment appraisal techniques as they relate to real estate, which are then applied to direct, indirect, and derivative property investment markets. Traditional appraisal models are critiqued to provide the rationale for the application of contemporary methods. Performance measurements are applied not just to property asset levels, but also to portfolios of properties.</p> | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MSRI921 | Property Asset Management | 3 | 0 | 3 |
| <p>This module will equip you with the knowledge and skills to manage property assets. You will explore the strategic role of property asset management in maximizing the value and performance of property assets while gaining comprehensive understanding of the role of property asset manager, as well as the models, and processes, and technologies that support informed decision-making. More so, you will examine property asset management practices in both the corporate and public sectors, which will allow you to develop an understanding of the unique considerations and best practices in each domain.</p> | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MSRI922 | Sustainable Urban Property Development | 3 | 0 | 3 |
| <p>The module is designed to equip students with critical knowledge and awareness of the key issues affecting the sustainability of towns and cities, informed by the UN Goal 11 on sustainable cities and communities. Students are introduced to urban development processes, appraisal techniques, and models of environmental sustainability, all of which are essential for understanding the social, economic, and environmental issues affecting cities and communities.</p> | | | | |

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|---|--------------------------------------|---------|---------|-------|
| MSRI923 | Real Estate Marketing Management | 3 | 0 | 3 |
| The course aims to provide students with the knowledge necessary to manage a real estate agency, to supervise the marketing of complex commercial and industrial property and to provide competent real estate advice. The contents are as follows. Introduction to real estate marketing. Researching the market for real estate agency services. Organizing the organization; Ethics of real estate marketing. Real estate marketing services. Sales Management special topics in marketing- marketing shopping centers and office buildings, staffing and directing the real estate office /department, controlling the real estate organization. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MSRI924 | Business Research and Statistics | 3 | 0 | 3 |
| This course provides a comprehensive foundation in research methods and statistical tools commonly applied in business research. It emphasizes the systematic process of identifying and formulating research problems, conducting critical literature reviews, and selecting appropriate research methodologies. Key topics include research design, sampling techniques, data collection methods, and the application of statistical techniques for data analysis. The course equips students with the skills necessary to conduct rigorous, evidence-based research to support decision-making in the business environment. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MSRI931 | Project Management of Urban Planning | 3 | 0 | 3 |
| This module is designed to develop your knowledge and understanding of the project management discipline. The module addresses a number of topics that are vital to the contemporary construction project manager. Project Management in construction and in general has three major components. The first is managing and leading the client organization. The second is managing and leading the project team and the third is planning, managing and controlling the project. It is not possible to cover the whole project management discipline in one single module, and many of the other subjects you need to know about are covered in the other five modules that are part of the MSc Construction Project Management Programme. This module serves as an overall foundation for the project management discipline in construction. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MSRI932 | Managing Big Data | 3 | 0 | 3 |
| This course introduces the key concepts and practical applications of managing and analyzing large datasets using modern tools and technologies. It focuses on topics such as energy-efficient systems, real-time data processing, and SQL-on-Hadoop for scalable data management. Students will explore resource management, scheduling techniques, and the role of big data in the Internet of Things (IoT). Through group projects, case studies, and practical experiments, they will develop the ability to interpret and apply big data solutions to real-world challenges effectively. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MSRI933 | Corporate Finance | 3 | 0 | 3 |
| This course examines advanced corporate finance concepts, including capital budgeting under risk, risk-return analysis, cost of capital, capital structure, and dividend policy. Emphasis is placed on applying financial models and tools to real-world decision-making in real estate investment, fostering critical thinking, analytical skills, and professional autonomy. | | | | |
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
| MSRI934 | Innovation and Entrepreneurship | 3 | 0 | 3 |
| This course explores the entrepreneurial process through which new ideas become the basis for viable enterprises. This course lays the foundation for sustainability-led innovation and its relation to Bahrain vision 2030 and delves into the process of innovation commencing from sources of innovation, finding resources, | | | | |

developing, and growing the venture. The course provides a combination of theoretical and hands-on learning through case studies from leading companies around the globe.

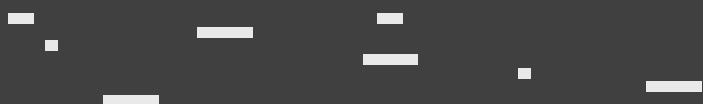
| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|----------------------------------|---------|---------|-------|
| MSRI935 | Islamic Commercial Jurisprudence | 3 | 0 | 3 |

Islamic law related to commerce; trade and finance (Fiqh Al-Muamalat) in contemporary commercial and financial environments. Sharia principles applied to financial transactions as encountered in Islamic financial institutions, including Takaful companies. Views on contentious issues in contemporary Islamic financial transactions. Commonly used contracts in light of the Sharia standards issued by Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI). The maqasid, or higher purposes, of Sharia in dealing with the broader spectrum of life.

| Course Code | Course Title | Lec Hrs | Lab Hrs | Units |
|-------------|------------------|---------|---------|-------|
| MSRI999 | Research Project | 3 | 0 | 3 |

This course enables students to undertake an independent, in-depth research project addressing complex issues within the global real estate and investment environment. Students are expected to apply advanced theoretical knowledge, critically review relevant literature, and use appropriate scientific research methodologies to investigate a defined problem. The project culminates in the submission of a comprehensive research report and an oral defense, demonstrating the ability to generate original insights and informed recommendations. Completion of the research project is a mandatory requirement for the MSc in Real Estate Management and Investment, and reflects the required research, analytical, and ethical standards.

College of Computer Studies (CCS)



College: College of Computer Studies

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|--|--|
| 19. Teaching Institution | University of Technology Bahrain (UTB) |
| 20. University Department | College of Computer Studies (CCS) |
| 21. Programme Title | Bachelor of science in Computer Science (BSCS) |
| 22. Title of Final Award | Bachelor of science in Computer Science (BSCS) |
| 23. Attendance Mode | Actual classroom learning-interactive (Full-time) |
| 24. Delivery Mode | On-campus (Traditional Learning) |
| 25. National Qualification Framework Level and Credit | NQF Level 8 594 NQF Credits (198 ACS Credits) |
| 26. Accreditation | ABET-CAC |
| 27. Other external influences | Local External Influences/References <ul style="list-style-type: none"> - Ministry of Education (MOE) - Higher Education Council (HEC) - Education and Training Quality Authority (BQA) International External Influences/References <ul style="list-style-type: none"> - ABET Computing Accreditation Commission (ABET-CAC) - Association in Computing Machinery (ACM) in Computing |
| 28. Date of production/revision of this specification | September , 2022 |
| 29. Aims of the Programme | |
| <p>The Computer Science Programme involves understanding concepts, principles, applications, and technologies of computing. It focuses on the study of data structures and algorithms, computer architecture, data communications and networking, operating systems, survey of programming languages and techniques in programming. It includes advanced topics in computing, but not limited to human computer interaction, web technologies, data analytics, artificial intelligence, mobile application development, cloud computing, and elective courses.</p> <p>The PEOs of the Computer Science programme are to produce graduates who will be able to:</p> <ol style="list-style-type: none"> 1. Apply knowledge to effectively analyze and assess real life problems to develop economically viable and socially acceptable computing solutions. 2. Demonstrate excellence in professionalism, moral and ethical conduct, interpersonal skills and adaptable communication to prevalent trends in technology and changing technology. 3. Work productively as successful computer professionals in diverse career paths including supportive and leadership roles on multidisciplinary teams or be active in higher studies. | |
| 30. Programme Intended Learning Outcomes | |
| <ol style="list-style-type: none"> 1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions. 2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline. 3. Communicate effectively in a variety of professional contexts. | |

4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

Teaching and Learning Methods

1. Constructive Method: Students are required to be fully engaged and active in the process of constructing meaning and knowledge based on their prior knowledge and experiences through the process of doing, making, writing, designing, creating and solving. Teachers implement differentiated learning, authentic assessment practices and incorporate technologies to improve individual learning experiences. It includes simulations, in-course projects, digital content, group discussions and reflections. This method strives to improve achievement by consciously developing students' ability to consider ideas, analyze perspectives, solve problems and make decisions on their own, thereby making them more responsible and independent.
2. Inquiry based Method. Students develop cognitive skills like critical thinking and problem solving by working on questions, problems, or scenarios and formulating creative solutions. The teachers use structured, guided or open inquiry to facilitate learning. As a process, students are involved in their learning by formulating questions, investigating, building their understanding and creating meaning and new knowledge in a certain lesson. Typically, activities include laboratory sessions.
3. Collaborative Method. Students are divided into small groups to learn something together and capitalize on one's other resources and skills, evaluating one another's ideas, and monitoring one another's work. It allows students to actively interact by sharing experiences and take on different roles. Typically, students are provided with problems or projects that they work on together to search for understanding, meaning, or solutions and each group is expected to work together developing or formulating solutions and presenting the solution in class. The activities include think-pair-share, jigsaw, or round-robin which effectively engage students to complete the tasks.
4. Experiential learning method. By engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. This includes team challenges, simulations, internships, capstone projects, and other extracurricular activities.

Assessment Methods

Assessment is done independently for each course. Variety of assessment tools will be used to assess achievement of intended learning outcomes including but not limited to: written examinations, assignments, case analysis, written reports, software demonstration and computer program/ software development project/programming exercises, presentations, projects and thesis.

31. Programme Structure**BACHELOR OF SCIENCE IN COMPUTER SCIENCE (BSCS)****CURRICULUM PLAN EFFECTIVE AY 2022-2023****FOUDATION COURSES**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|---------------------------|---------|---------|--------------|----------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------|-----------------------------------|---------|---------|--------------|-----------------|
| CSCI617 | Introduction to Computing | 2 | 2 | 3 | |
| ENGL611 | English Communication Skills 1 | 3 | 0 | 3 | |
| ARAB600 | Arabic Language | 3 | 0 | 3 | |
| EUTH500 | Euthenics | 1 | 0 | 0 | |
| MATH631 | Calculus 1 | 5 | 0 | 5 | |
| HIST600 | History of Bahrain and GCC Region | 3 | 0 | 3 | |
| TOTAL | | | | 17 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--------------------------------|---------|---------|--------------|-----------------|
| CSCI626 | Ethics for Computing | 2 | 0 | 2 | CSCI617 |
| CSCI627 | Computer Programming 1 | 2 | 2 | 3 | CSCI617 |
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
| HUMR600 | Human Rights | 3 | 0 | 3 | |
| CHEM611 | General Chemistry | 2 | 2 | 3 | |
| MATH711 | Calculus 2 | 5 | 0 | 5 | MATH631 |
| Total Units | | | | 19 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT units | PREREQUISITE(S) |
|--------------------|-------------------------------|---------|---------|--------------|-----------------|
| CSCI628 | Multimedia Development | 2 | 2 | 3 | CSCI617 |
| CSCI638 | Digital logic Design | 2 | 2 | 3 | MATH631 |
| CSCI639 | Computer Programming 2 | 2 | 2 | 3 | CSCI627 |
| ENGL631 | Speech and Oral Communication | 2 | 2 | 3 | ENGL621 |
| MATH622 | Discrete Mathematics | 3 | 0 | 3 | MATH631 |
| PHYS631 | University physics | 2 | 2 | 3 | MATH631 |
| Total Units | | | | 18 | |

SECOND YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--------------------------------------|----------------|----------------|---------------------|------------------------|
| CSCI711 | Data Structures | 2 | 2 | 3 | CSCI627 |
| CSCI712 | Green Computing | 3 | 0 | 3 | CSCI617 |
| ENGL711 | Technical Writing | 3 | 0 | 3 | ENGL621 |
| ACCT600 | Introduction to Financial Accounting | 3 | 0 | 3 | MATH631 |
| MATH722 | Advanced Mathematics | 2 | 2 | 3 | MATH711 |
| PHYS711 | University Physics 2 | 2 | 2 | 3 | PHYS631 |
| Total Units | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|------------------------|
| CSCI721 | Object-Oriented Programming | 2 | 2 | 3 | CSCI711 |
| CSCI722 | Database Management Systems 1 | 2 | 2 | 3 | CSCI711 |
| CSCI723 | Computer Organization and Architecture | 2 | 2 | 3 | CSCI638 |
| CSCI724 | Web Technologies 1 | 2 | 2 | 3 | CSCI639 |
| CSCI725 | Introduction to Data Science | 2 | 2 | 3 | CSCI711 |
| MATH621 | Probability and Statistics | 3 | 0 | 3 | |
| Total Units | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--------------------------------|----------------|----------------|---------------------|------------------------|
| CSCI731 | Computer Networks 1 | 2 | 2 | 3 | CSCI723 |
| CSCI732 | Database Management Systems 2 | 2 | 2 | 3 | CSCI722 |
| CSCI733 | System Analysis and Design | 2 | 2 | 3 | CSCI722 |
| CSCI734 | Algorithm Analysis and Design | 3 | 0 | 3 | CSCI711 |
| CSCI735 | Automata and Formal Languages | 3 | 0 | 3 | MATH622 |
| MATH732 | Numerical Methods and Analysis | 2 | 2 | 3 | MATH621 |
| Total Units | | | | 18 | |

THIRD YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---------------------|----------------|----------------|---------------------|------------------------|
| CSCI811 | Computer Graphics | 2 | 2 | 3 | CSCI721 |
| CSCI812 | Operating System | 2 | 2 | 3 | CSCI723 |

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| | | | | | |
|--------------------|------------------------------|---|---|-----------|---------|
| CSCI813 | Computer Networks 2 | 2 | 2 | 3 | CSCI731 |
| CSCI814 | Visual Programming | 2 | 2 | 3 | CSCI733 |
| CSCI815 | Fundamentals of Cryptography | 2 | 2 | 3 | CSCI731 |
| MATH733 | Linear Algebra | 2 | 2 | 3 | MATH732 |
| Total Units | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--------------------------------------|----------------|----------------|---------------------|------------------------|
| CSCI821 | Theory of Programming Languages | 2 | 2 | 3 | CSCI732 |
| CSCI822 | Statistical Analysis and Data Mining | 2 | 2 | 3 | CSCI732 |
| CSCI823 | Software Engineering | 2 | 2 | 3 | CSCI733 |
| CSCI824 | Web Technologies 2 | 2 | 2 | 3 | CSCI724 |
| CSCI825 | Human Computer Interaction | 3 | 0 | 3 | CSCI733 |
| MATH821 | Optimization Methods | 3 | 0 | 3 | MATH732 |
| Total Units | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|------------------------------------|----------------|----------------|---------------------|------------------------|
| CSCI831 | Software Quality Assurance | 3 | 0 | 3 | CSCI733 |
| CSCI832 | Parallel and Distributed Computing | 2 | 2 | 3 | CSCI813 |
| CSCI833 | Software Project Management | 2 | 2 | 3 | CSCI733 |
| CSCI834 | Cyber Security | 3 | 0 | 3 | CSCI813 |
| CSCI835 | Cloud Computing | 3 | 0 | 3 | CSCI813 |
| CSCI880 | Elective 1 | | | 3 | Check list below |
| Total Units | | | | 18 | |

FOURTH YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--------------------------------|----------------|----------------|---------------------|------------------------|
| CSCI841 | Mobile Application Development | 2 | 2 | 3 | CSCI825 |
| CSCI842 | Internship | 0 | 0 | 6 | CSCI833 |
| CSCI843 | Software Project A | 3 | 0 | 3 | CSCI833 |
| CSCI844 | Ethical Hacking | 2 | 2 | 3 | CSCI813 |
| CSCI881 | Free Elective | 3 | 0 | 3 | |
| Total Units | | | | 18 | |

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SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|------------------------|
| CSCI851 | Big data Analytics | 2 | 2 | 3 | CSCI822 |
| CSCI852 | Artificial Intelligence and Machine Learning | 2 | 2 | 3 | CSCI821 |
| CSCI853 | Software Project B | 3 | 0 | 3 | CSCI843 |
| CSCI854 | Special Topics in Computing | 3 | 0 | 3 | CSCI835 |
| CSCI855 | Technopreneurship | 3 | 0 | 3 | CSCI824 |
| CSCI882 | Elective 2 | | | 3 | Check list below |
| Total Units | | | | 18 | |
| Grand Total | | | | 198 | |

ELECTIVE COURSES**MAJOR ELECTIVE 1**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-------------------------------------|----------------|----------------|---------------------|------------------------|
| CSCI880a | AR VR Tech | 2 | 2 | 3 | CSCI825, CSCI813 |
| CSCI880b | Software Analysis and Testing Tools | 2 | 2 | 3 | |
| CSCI880c | Embedded System | 2 | 2 | 3 | |

MAJOR ELECTIVE 2

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---|----------------|----------------|---------------------|------------------------|
| CSCI882a | Internet of Things | 3 | 0 | 3 | CSCI834, CSCI831 |
| CSCI882b | Wireless and Mobile Networks | 2 | 2 | 3 | |
| CSCI882c | E-Commerce Infrastructure And Application | 3 | 0 | 3 | |

32. Awards and Credits

| | |
|-----------------------------|---|
| Degree/ Certificate Awarded | Bachelor of Science in Computer Science |
| Total Units for Degree | 198 |
| Total Trimesters Completed | 11 |

33. Admission Criteria

A. Acceptance For First Year Undergraduate Applicants

Acceptance to the University depends on the following admissions requirements:

9. Completely filled out an admission application form.
10. Minimum secondary school scores 60% or its equivalent.
11. Online Placement test (Oxford Online Placement Test (OOPT)) Result (if needed)
12. Submission of all required documents stated in the Admissions Policy.

To be admitted to any undergraduate programme, the applicant must satisfy the minimum secondary school grades or its equivalent without the need to take the remediation classes of English and Math, as shown in the following table:

| Subtest Component for Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification | | BSCS |
|---|----------------------------------|---------------------------------------|
| Mathematics | Science/ Technical/General Track | At least 70% or C |
| | Commercial Track | At least 80% Or B |
| | Literature and Islamic Tracks | All must undergo remedial mathematics |
| Science | | 60 |
| English | | At least 80 or B |

*This is applicable to Bahraini and similarly equivalent qualification

3. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program.

| Subtest Component for Other Qualification (Indian, Pakistan, and West African) | | BSCS |
|---|----------------------------------|---------------------------------------|
| Mathematics | Science/ Technical/General Track | At least 51 or C1 |
| | Commercial Track | At least 71 or B1 |
| | Literature and Islamic Tracks | All must undergo remedial mathematics |
| Science | | 60 |
| English | | At least 71 or B1 |

*Note: Science component is subject to the evaluation of the Dean.

For the undergraduate applicant who did not meet the minimum required secondary school grades in Mathematics and English or its equivalent, his/her admissions depend on the following criteria:

| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|-----------|------------------------|--|---------|
|-----------|------------------------|--|---------|

| | | | |
|----------------|---|-------------------|---|
| All Programmes | 60-79 % grade in English | Score \geq 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| BSCS | For Scientific, General, and technical Track: Score 50-69% in Math | N/A | Foundation Course in Math |
| | Literature and Islamic Tracks | N/A | Foundation Course in Math |
| | Commercial Track: Score 50-79% | N/A | Foundation Course in Math |
| All Programmes | CGPA <60% for Bahraini and KSA CGPA <41% for Indian and Pakistan | N/A | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

k. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

l. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program (English Foundation).

m. IELTS/TOEFL

Applicants who submit official IELTS or TOEFL certificates issued by accredited examination centers, with a minimum score of 450 on the TOEFL (paper-based), 131 on the TOEFL (computer-based), or 5.0 on the IELTS, are exempted from taking the required English Placement Test.

In addition, applicants who obtain an IELTS score of 5.5 or higher or a TOEFL score that meets the equivalent standard may qualify for English course exemptions based on their results. This policy recognizes academic achievement by allowing eligible students to be exempted from enrolling in introductory English courses upon admission.

| IELTS/TOEFL Scores | Exemption |
|--|---|
| Qualified applicants with 5.5 IELTS scores or TOEFL: 496 (paper-based) or 169 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 (English Communication Skills 1) |
| Qualified applicants with 6.0 IELTS scores or | Satisfying this requirement means to be exempted |

TOEFL: 546 (paper-based) or 211 (computer based)

from taking ENGL401/ENGL611 and ENGL402/ENGL621
(English Communication Skills 1 and 2)

n. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature and Islamic tracks must take the remediation course in Math.

o. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

B. For Undergraduate Transfer Student Applicants

Application Requirements:

19. Completely filled out an admission application form
20. Official Transcript of Records (TOR) from the university previously attended. Rules and regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school certificates are to be applied when necessary.
21. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
22. Certificate of Transfer from the university previously attended stamped by MOE, if any.
23. Withdrawal Certificate stamped by MOE
24. Submission of all required documents stated in the admissions policy.

Admissions Requirements:

10. For Bahrain and KSA qualifications, the applicant should have at least a secondary school average of 60%. For non-Bahrain secondary qualifications (Indian and Pakistan) the applicant should have at least 41% secondary school average; and for other non-Bahraini qualifications please refer to the table of cut-off.
11. If the applicant has taken and passed courses in English and Mathematics in the previous university, the applicant will be exempted in taking the remedial courses in both English and

Mathematics. The applicant may proceed to mainstream university courses and is eligible to apply for credit transfer.

- 12.** If the applicant has not taken any course in English and Mathematics, the basis for evaluation whether remedial course in English and mathematics is required or not is the subject scores in his/her last year in the secondary school certificate using the table presented earlier.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. Practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or re-admitted student from UTB.

The University requires the undergraduate student to complete at least 50% of the required credit units/hours of a programme in residence at UTB. The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit units/hours based on his/her original degree from another university.

34. CGPA Requirement for Graduation

The required CGPA for an undergraduate student to be eligible for graduation is 2.0 out of 4.

35. Career Pathways

The BSCS graduates can have work after graduation along programming, database design and management, networking, web development, multimedia development, computer graphics and animation, mobile applications development and project management. In addition, the programme can lead graduates for postgraduate degrees in computing.

| 18. BSCS CURRICULUM SKILLS MAPPING | | | | | | | | | |
|------------------------------------|----------------|-----------------------------------|-----------------------------------|--|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Learning Outcomes / Student Outcomes | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 |
| Year 1 1st Tri | CSCI617 | Introduction to Computing | (C) | ✓ | ✓ | | | | |
| | ENGL611 | English Communication Skills1 | (C) | | | ✓ | | | |
| | ARAB600 | Arabic Language | (C) | | | ✓ | | | |
| | EUTH500 | Euthenics | (C) | | | | | | |
| | MATH631 | Calculus 1 | (C) | ✓ | | | | | |
| | HIST600 | History of Bahrain and GCC Region | (C) | | | | ✓ | | |
| | CSCI626 | Ethics for Computing | (C) | | | | ✓ | | |
| Year 1 2nd Tri | CSCI627 | Computer Programming1 | (C) | ✓ | ✓ | | | | ✓ |
| | ENGL621 | English Communication Skills2 | (C) | | | ✓ | | | |



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| 18. | BSCS CURRICULUM SKILLS MAPPING | | | | | | | | |
|-------------------|--------------------------------|--|-----------------------------------|--|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Learning Outcomes / Student Outcomes | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 |
| | HUMR600 | Human Rights | (C) | | | | ✓ | | |
| | CHEM611 | General Chemistry | (C) | ✓ | | | | ✓ | ✓ |
| | MATH711 | Calculus 2 | (C) | ✓ | | | | | |
| Year 1 3rd Tri | CSCI628 | Multimedia Development | (C) | | ✓ | | | ✓ | |
| | CSCI638 | Digital logic Design | (C) | ✓ | ✓ | | | | |
| | CSCI639 | Computer Programming2 | (C) | ✓ | ✓ | | ✓ | | ✓ |
| | ENGL631 | Speech and Oral Communication | (C) | | | ✓ | | | |
| | MATH622 | Discrete Mathematics | (C) | ✓ | | | | | |
| | PHYS631 | University Physics1 | (C) | ✓ | | | | | |
| Year 2 1st Tri | CSCI711 | Data Structures | (C) | ✓ | ✓ | ✓ | | | ✓ |
| | CSCI712 | Green Computing | (C) | ✓ | ✓ | | | | |
| | ENGL711 | Technical Writing | (C) | | | ✓ | | | |
| | ACCT600 | Introduction to Financial Accounting | (C) | ✓ | | | | | |
| | MATH722 | Advanced Mathematics | (C) | ✓ | | | | | |
| | PHYS711 | University Physics2 | (C) | ✓ | | | | | |
| Year 2 2nd Tri | CSCI721 | Object-Oriented Programming | (C) | ✓ | ✓ | | | | |
| | CSCI722 | Database Management Systems 1 | (C) | ✓ | ✓ | | | ✓ | ✓ |
| | CSCI723 | Computer Organization and Architecture | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSCI724 | Web Technologies 1 | (C) | ✓ | ✓ | | | | |
| | CSCI725 | Introduction to Data Science | (C) | ✓ | ✓ | | | | ✓ |
| | MATH721 | Probability and Statistics | (C) | ✓ | | | | | |
| Year 2 3rd Tri | CSCI731 | Computer Networks 1 | (C) | ✓ | | | | ✓ | ✓ |
| | CSCI732 | Database Management Systems 2 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSCI733 | System Analysis and Design | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSCI734 | Algorithm Analysis and Design | (C) | ✓ | ✓ | | | | |
| | CSCI735 | Automata and Formal Languages | (C) | ✓ | ✓ | | | | |
| | MATH732 | Numerical Methods | (C) | ✓ | | | | | |



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| 18. | BSCS CURRICULUM SKILLS MAPPING | | | | | | | | |
|-------------------|--------------------------------|--|-----------------------------------|--|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Learning Outcomes / Student Outcomes | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 |
| | | and Analysis | | | | | | | |
| Year 3 1st Tri | CSCI811 | Computer Graphics | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSCI812 | Operating System | (C) | ✓ | ✓ | | | ✓ | ✓ |
| | CSCI813 | Computer Networks 2 | (C) | ✓ | ✓ | | | ✓ | ✓ |
| | CSCI814 | Visual Programming | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSCI815 | Fundamentals of Cryptography | (C) | ✓ | ✓ | ✓ | | | |
| | MATH733 | Linear Algebra | (C) | ✓ | | | | | |
| Year 3 2nd Tri | CSCI821 | Theory of Programming Languages | (C) | ✓ | ✓ | | | | |
| | CSCI822 | Statistical Analysis and Data Mining | (C) | ✓ | | | | ✓ | ✓ |
| | CSCI823 | Software Engineering | (C) | ✓ | ✓ | | | | ✓ |
| | CSCI824 | Web Technologies 2 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSCI825 | Human Computer interaction | (C) | ✓ | | ✓ | | ✓ | |
| | MATH821 | Optimization Methods | (C) | ✓ | ✓ | | | | |
| Year 3 3rd Tri | CSCI831 | Software Quality Assurance | (C) | ✓ | | | ✓ | ✓ | |
| | CSCI832 | Parallel and Distributed Computing | (C) | ✓ | ✓ | | | | ✓ |
| | CSCI833 | Software Project Management | (C) | ✓ | | | ✓ | ✓ | |
| | CSCI834 | Cyber security | (C) | ✓ | ✓ | ✓ | | | ✓ |
| | CSCI835 | Cloud Computing | (C) | ✓ | ✓ | | | ✓ | |
| | CSCI880 | Elective 1 | (C) | ✓ | ✓ | | | ✓ | |
| Year 4 1st Tri | CSCI841 | Mobile Application Development | (C) | ✓ | ✓ | ✓ | | | ✓ |
| | CSCI842 | Internship | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | CSCI843 | Software Project A | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | CSCI844 | Ethical Hacking | (C) | ✓ | ✓ | ✓ | | | ✓ |
| | CSCI881 | Free Elective | (C) | ✓ | | | | | |
| Year 4 2nd Tri | CSCI851 | Bigdata Analytics | (C) | ✓ | ✓ | ✓ | | | ✓ |
| | CSCI852 | Artificial Intelligence and Machine Learning | (C) | ✓ | | ✓ | | ✓ | ✓ |
| | CSCI853 | Software Project B | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | CSCI854 | Special Topics in Computing | (C) | ✓ | | ✓ | | | ✓ |
| | CSCI855 | Technopreneurship | (C) | ✓ | | ✓ | | ✓ | |

| 18. | BSCS CURRICULUM SKILLS MAPPING | | | | | | | | |
|----------------|--------------------------------|---|-----------------------------------|--|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Learning Outcomes / Student Outcomes | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 |
| | CSCI882 | Elective 2 | (E) | | | | | | |
| | ELECTIVES | | | | | | | | |
| | CSCI880a | AR VR Tech | (E) | ✓ | ✓ | | | ✓ | |
| | CSCI880b | Software Analysis and Testing Tools | (E) | ✓ | ✓ | | | ✓ | |
| | CSCI880c | Embedded System | (E) | ✓ | ✓ | | | ✓ | |
| | CSCI882a | Internet of Things | (E) | ✓ | ✓ | ✓ | ✓ | | |
| | CSCI882b | Wireless and Mobile Network | (E) | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | CSCI882c | E-Commerce Infrastructure And Application | (E) | ✓ | ✓ | | | ✓ | |

BACHELOR OF SCIENCE IN COMPUTER SCIENCE (BSCS)
CURRICULUM PLAN EFFECTIVE AY 2022-2023

COURSES DESCRIPTION

FOUNDATION COURSES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|---------------------------|---------|---------|--------------|------------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| This course is a foundation in mathematics focus on the building of the knowledge and skills and understanding to solve problems in college algebra and trigonometry. It deals with the topics on equations and Inequalities; functions and graphs; polynomial and rational Functions; exponential and logarithmic functions; trigonometric functions; trigonometric identities and equations; application of trigonometry; systems of equations and inequalities; and matrices. It also includes the application of the mathematical thinking process. | | | | | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| ENGL500 is a required foundation course for entering students whose English language skills need further improvement and enhancement to be able to cope with the university's academic courses. This course introduces the students to the English language where they get involved and engaged in the learning process. It utilizes an integrated approach in developing the students' English macro communication skills in speaking, listening, grammar, and vocabulary in one phase (PR intermediate) which will serve as the benchmark for the next level first year English course. Furthermore, the course intensifies its intended learning objectives with the comprehensive utilization of audio-lingual presentations, includes information related to dictionary use, basic grammar rules, daily use vocabulary words through a variety of contexts, written responses, writing structures, settings of writing, and the process of forming written and spoken communications. Hence, the students are expected to gain more knowledge to communicate effectively in | | | | | |



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English.

FIRST YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC HRS | LAB HRS | CREDIT UNITS | PRE-REQUISITE(S) |
|---|-----------------------------------|--------------------|--------------------|-------------------------|-------------------------|
| CSCI617 | Introduction to Computing | 2 | 2 | 3 | |
| This course covers a detailed knowledge and understanding of basic IT infrastructure. Students will gain proficiency in articulating the concept of preventive maintenance, identifying relevant resources, and discussing common challenges associated with computers. Additionally, the curriculum provides an overview of major operating systems, including Windows, Linux, and Mac OS, covering topics such as hardware administration, resource allocation, data management, and graphical user interface design. Furthermore, it ensures thorough coverage of five domains, with mobile devices, networking, hardware, virtualization and cloud computing, and hardware and network troubleshooting. | | | | | |
| ENGL611 | English Communication Skills 1 | 3 | 0 | 3 | |
| This is an introductory course in English communication designed to provide comprehensive, up-to-date and relevant instruction in the correct use of grammar. It intends to build up students' confidence in communicating their thoughts, ideas, information and messages through the functions and structures of different words, phrases, clauses, sentences, and paragraphs. In addition, the integration of language skills increases their communicative competence and prepares them for the academic and social challenges in college and beyond. | | | | | |
| ARAB600 | Arabic Language | 3 | 0 | 3 | |
| The course focuses on the fundamentals of Arabic language, such as reading, analyzing, and critique. It explains the characteristics of the required texts, which deal with different literary genres, prose and poetry. The course also focuses on the understanding and application of grammatical rules and basic morphological methods in Arabic, taking into account the correct spelling skills. | | | | | |
| EUTH500 | Euthenics | 1 | 0 | 0 | |
| This course is designed to bring in the policies and procedures in the university, to guide the students in the performance of their respective role and to become adept on ideals needed in their academic pursuit. Thus, students are oriented on the history, vision, mission, values and objectives of the university, the services and academic support available, the academic and non-academic policies, the different misconduct and violations with corresponding penalties in which the learning objectives are better facilitated by various classroom discussion through collaborative teamwork learning experience. | | | | | |
| MATH631 | Calculus 1 | 5 | 0 | 5 | |
| This course is intended to develop practical skills in differential calculus. Emphasis is placed on conics, functions, limits and continuity, explicit and implicit differentiation of algebraic and transcendental functions, higher-order derivatives, and its applications, related rates, equations of tangent and normal lines, sketching polynomial curves, optimization (maxima and minima). | | | | | |
| HIST600 | History of Bahrain and GCC Region | 3 | 0 | 3 | |
| This Course includes the history of the Kingdom of Bahrain and the Arabian Gulf region. It includes the important events in Bahrain and the Arabian Gulf region and their impact on the current situation. It covers the strategic importance of Bahrain, starting with "Ancient civilizations and passing through" the Islamic era, Bahrain's entry into Islam, Portuguese occupation, competition of powers in the 17th century and the rise of a tribe of Al-Atub. It includes the history of Bahrain under the British protection and the conventions between Bahrain and Great Britain up to British troops leaving the region. It describes the places and persons as well as the historical developments and achievement in Bahrain during the time of Al- Khalifah. It includes | | | | | |



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independence of Bahrain, issuing of the first constitutional law, reform project by His Majesty King Hamad, constitutional amendments, establishment of GCC, history of Arab Gulf states. It makes the student able to present his patriotic character through historical discussions.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITES |
|---|--------------------------------|--------------------|--------------------|-------------------------|----------------------|
| CSCI626 | Ethics for Computing | 2 | 0 | 2 | CSCI617 |
| This course provides exploration and analysis of a broad range of topics regarding the ethical implications of widespread use of computer technology. Topics include socio-technical computer ethics, ethics and information technology, ethics in IT configured societies, information flow privacy and surveillance, digital intellectual property, and professional ethics in computing. | | | | | |
| CSCI627 | Computer Programming 1 | 2 | 2 | 3 | CSCI617 |
| This course covers detailed knowledge in problem solving and algorithm development, with emphases on developing good programming habits, and programming in a modern computer language. The course familiarizes the students with the features of object-oriented programming and its applications to solve the problems. It includes an overview of the Java language syntax, including packages, classes, methods, variables, conditional statements, control flow and arrays. The laboratory focuses on the implementation of the programming theories and concepts in Java programming language. | | | | | |
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
| This is an intermediate course in English communication geared towards equipping the college students with writing skills in preparation for academic writing. It progresses from familiarizing the sentence conventions to balancing the structures of the sentence for variation and rhythm. Further, it enables students to follow the principles that govern the composition writing in achieving unity, coherence, and emphasis; to improve their expository, descriptive, narrative and argumentative works and to get hold of the discipline in academic writing for future advantages by providing them the opportunity in adhering the process of writing for effective communication. | | | | | |
| HUMR600 | Human Rights | 3 | 0 | 3 | |
| This course makes the students able to know the background, main concepts of Human Rights and the philosophical thoughts and Islamic view which contribute in modern Human Rights. It makes them able to analyze what is mentioned in different kinds of Human Rights sources as Universal Declaration of Human Rights, International Covenant on Civil and Political Rights and International Covenant on Economic, Social and Cultural Rights. It deals in the same approach with the National Sources of Human Rights such as the Constitutional Law of Kingdom of Bahrain and National Action Charter with applications as well. The course makes the students able to analyze, discuss and debate Human Rights issues in different ways. | | | | | |
| CHEM611 | General Chemistry | 2 | 2 | 3 | |
| This course demonstrates atomic theories, relationships between structure and properties of matter, scientific notation, density calculation, Atomic structure and energy levels, periodic table, ions formation and chemical bonding, chemical reactions and emphasizing the chemical change, balancing equation, Discussion on gas law includes properties and application of gas laws, Acids and bases, solution and clarification of acid – base concept | | | | | |
| MATH711 | Calculus 2 | 5 | 0 | 5 | MATH611 |
| This is the second course from a sequence of two calculus courses. The course is an enhancement on the topics taught in Calculus I, which contained primarily on the applications of integration such as calculating volumes, lengths of curves and surface area, the techniques of integration of various functions, and proper | | | | | |

and improper integrals. It also deals with sequences, series and their convergence, powers series and their convergence including differentiating and integrating power series. The course ends with the topics on the introduction of polar coordinate system, polar curves and some basic polar calculus.

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|-------------------------------|------------|------------|-----------------|-----------------|
| CSCI628 | Multimedia Development | 2 | 2 | 3 | CSCI617 |
| <p>This course provides detailed information and some advanced necessary skills on multimedia development and delivery. The course familiarizes the students with the components of multimedia, its applications, underlying techniques of incorporating multiple media, compression and sharing. Students will learn to apply the art of visual communication using multimedia technologies. The laboratory focuses on training the students to implement the theoretical knowledge that they have gained in lecture along with their creativity using any multimedia software.</p> | | | | | |
| CSCI638 | Digital logic Design | 2 | 2 | 3 | MATH631 |
| <p>This course explores the foundational concepts of digital logic systems. It covers number systems, coding systems (BCD, ASCII, Gray code), Boolean algebra, logic gates, and combinational and sequential circuits. Students design and analyze encoders, decoders, multiplexers, arithmetic units, flip-flops, latches, counters, and registers. The course emphasizes optimization techniques such as Karnaugh Maps and Boolean identities.</p> <p>Laboratory sessions use industry-standard simulation tools such as Logisim, Multisim, and Quartus II to implement designs and test circuit behavior. Students also gain exposure to hardware description languages (HDL) through VHDL/Verilog-based mini-projects and analyze timing diagrams, enabling a practical, project-based learning experience.</p> | | | | | |
| CSCI639 | Computer Programming 2 | 2 | 2 | 3 | CSCI627 |
| <p>This is an introductory course designed to equip students with the foundational skills necessary for computer programming. The lecture classes will cover a broad range of topics essential for beginners, such as understanding tokens, variables, data types, and control structures. In addition to that, students will learn how to manage input and output data and string manipulation, providing a strong theoretical foundation for students.</p> <p>In laboratory sessions, students will apply the theoretical concepts learned in lectures using Python. These sessions aim to solidify students' understanding and enable them to confidently apply their programming skills in practical scenarios.</p> | | | | | |
| ENGL631 | Speech and Oral Communication | 2 | 2 | 3 | ENGL621 |
| <p>This is a developmental course in English communication geared towards competent, efficient, and effective interpersonal speaking across communicative contexts. It refines oral communication skills through accurate articulation of segmental phonemes, pronunciation drills and enunciation of the suprasegmental features of speech, specifically sentential stress, and intonation. Further, it incorporates the mechanics and techniques of speech craft and delivery with emphases on practical speaking experiences and analysis of audience psychology, which are deemed applicable in diverse speech situations.</p> | | | | | |
| MATH622 | Discrete Mathematics | 3 | 0 | 3 | MATH611 |
| <p>This course introduces fundamental concepts and techniques in set theory in preparation for its many applications in computer science. Topics include propositions, predicates, proofs, sets, relations, functions, graphs and trees. It simplifies and evaluates basic logic statements including compound statements, implications, inverses, converses, and contrapositives using truth table and the properties of logic.</p> | | | | | |

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| | | | | | |
|---|----------------------|---|---|---|---------|
| PHYS631 | University Physics 1 | 2 | 2 | 3 | MATH631 |
| This course is designed to explore the concepts of motion using vectors and other mathematical models and their advanced application, such as the application of Newton's laws of motion, projectile motion, work, energy, momentum and impulse, rotational dynamics, equilibrium of a rigid body, and periodic motion. | | | | | |

SECOND YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|--------------------------------------|---------|---------|--------------|-----------------|
| CSCI711 | Data Structures | 2 | 2 | 3 | CSCI639 |
| This course covers advanced problem solving in linear and non-linear data structures and their implementation. Topics include arrays, sorting and searching techniques, stacks, queues, linked lists, trees and hash tables. In addition, it covers various strategies for choosing appropriate structures according to the system requirements. The laboratory portion covers the implementation of linear data structures such as stacks and queues and nonlinear data structure like trees and graphs using array and linked list. | | | | | |
| CSCI712 | Green Computing | 3 | 0 | 3 | CSCI617 |
| This course empowers students to reduce energy use, waste, and other environmental impacts of IT systems while reducing life cycle costs, thereby improving competitive advantage. Students learn how to measure computer power usage, minimize power usage, procure sustainable hardware, design green data centers, recycle computer equipment, configure computers to minimize power, use virtualization to reduce the number of servers, and other green technologies. Students also learn how to make green IT an integral part of organizational culture and planning, to foster long term sustainable information technology. | | | | | |
| ENGL711 | Technical Writing | 3 | 0 | 3 | ENGL621 |
| This is an advanced course in English academic writing designed to deal with the application of the technical writing principles with the correspondence on business, science, and technology. It aims to develop the technical writing skills and communication of the college students thru the discussions of its elements and ethics with the use of digital technologies. Furthermore, it enables students to adapt the various communication routes in the workplace, to conceptualize suitable contents of technical writing, to understand the characteristics and other methods of communication techniques, to plan and organize advanced level tasks and to work effectively and with accountability with other team members in a creative and productive manner, in any language learning scenario when achieving personal and group outcomes. | | | | | |
| ACCT600 | Introduction to Financial Accounting | 3 | 0 | 3 | MATH631 |
| This course deals with detailed knowledge and understanding of the accounting scope and purpose of financial statements for external reporting, users' and stakeholders' needs, the main elements of financial reports, the regulatory framework (legislation and regulation, reasons and limitations, relevance of accounting standards), duties and responsibilities of those charged with governance, the qualitative characteristics of financial information and the use of double-entry accounting system. | | | | | |
| MATH722 | Advanced Mathematics | 2 | 2 | 3 | MATH711 |
| This course deals with the study of complex numbers, series solutions of ordinary differential equations by power series, Bessel Function, Frobenius method. Basics of Fourier series, Fourier transform, Laplace, and inverse Laplace Transforms. Using MATLAB or other mathematical software in order to solve mathematical problems | | | | | |
| PHYS711 | University Physics 2 | 2 | 2 | 3 | PHYS631 |
| This course is designed to explore the concepts of electricity and magnetism using the concepts of | | | | | |

mechanics, vectors, and other mathematical models and their advanced application, such as application of Coulomb's law, Gauss's law, Ohm's law, Kirchhoff's laws, electric potential and potential difference, basic circuits, series and parallel circuits and combinations, magnetic field and flux, induced EMF, and applications such as electric motors and basic AC electric generators.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|--|--------------------|--------------------|-------------------------|------------------------|
| CSCI721 | Object Oriented Programming | 2 | 2 | 3 | CSCI711 |
| <p>This course covers the advanced concepts of object-oriented programming such as abstraction, inheritance, polymorphism, and Encapsulation. Topics also include functions, pointers, overloading operators, templates, exceptions handling and Input Output streams for programming applications.</p> <p>The laboratory focuses on training the students with hands-on experience on Object Oriented Concepts.</p> | | | | | |
| CSCI722 | Database Management System 1 | 2 | 2 | 3 | CSCI711 |
| <p>This course provides advanced core theories and practical skills in databases and database management systems with information technology applications. The theoretical knowledge covers Database Environment, Relational Model, Database Operations, Structured Query Language, Entity Relationship Model and Normalization. It exposes the student to the advanced concepts and techniques in database development as well provides a foundation for research in databases.</p> <p>The laboratory practices the Data Definition Language (DDL) Commands, Data Manipulation Language (DML) Commands, Data Query Language (DQL) Commands, Transaction Control Language (TCL) Commands, SQL Built-in Functions, Constraints, Joins, GroupBy Command, Subqueries and Database Objects using Oracle SQL Developer tool.</p> | | | | | |
| CSCI723 | Computer Organization and Architecture | 2 | 2 | 3 | CSCI638 |
| <p>This course provides essential knowledge and understanding of computer organization and architecture, including system functions, components, and their interconnections. It covers the theories, principles, and concepts related to memory hierarchy and organization, I/O peripherals and interfacing, instruction sets based on the 8086 microprocessor, addressing modes, and memory access techniques. The course also explores processor structure and functions, including interrupts, and introduces RISC and CISC architectures. Through laboratory sessions and in-course projects, students will creatively implement complex microprocessor-based applications using Assembly language.</p> | | | | | |
| CSCI724 | Web Technologies 1 | 2 | 2 | 3 | CSCI639 |
| <p>This course provides an overview of modern web technologies and tools used for designing and developing interactive web applications. The course focuses on HTML, CSS, and JavaScript as core technologies for structuring, styling, and adding interactivity to web pages. Students will explore the principles of responsive design, client-side scripting, and best practices for creating user-friendly and accessible websites. Through practical lab sessions, students will develop complete web pages and simple web applications that function across major browsers.</p> | | | | | |
| CSCI725 | Introduction to Data Science | 2 | 2 | 3 | CSCI711 |
| <p>This course utilizes several open-source tools to address big data challenges, taking an "Open" or technology-neutral approach. It covers concepts, and techniques needed to deal with various aspects of data science</p> | | | | | |

practice, including data collection, cleansing, mangling, and integration, exploratory data analysis, predictive modeling, descriptive modeling, data product creation, machine learning algorithms, evaluation, effective communication and Data Visualization.

MATH621

Probability and Statistics

3

0

3

This course provides a demonstration of the main concepts of probability and statistics with applications. IT also covers identifying the theorem of probability and linked with real life problems. How to differentiate between the combination and permutation, explain how to find the mean and variance from the moment generating function. Explain and interpret the findings from different hypothesis tests for decision making. Finally, SPSS will be used to run the statistical measures (e.g. hypothesis tests and regression model)

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|-------------------------------|------------|------------|-----------------|-----------------|
| CSCI731 | Computer Networks 1 | 2 | 2 | 3 | CSCI723 |
| This course integrates the core theories, principles, concepts, structure, functions and components of the Internet and computer networks. The OSI and TCP/IP models are used to examine the services and the associated protocols in each layer. The concepts and structure of IPv4 addressing and subnetting, its application, operation and implementation to networks are discussed. The laboratory part makes use of a range of approaches including the Packet Tracer and GNS3 to allow students to implement static routing and critically analyze network requirements, issues and/or problems. These simulators will allow the students to build networks, use appropriate devices and IP addresses, and perform configurations. | | | | | |
| CSCI732 | Database Management System 2 | 2 | 2 | 3 | CSCI722 |
| This course focuses on the practical implementation of computerized database systems using SQL and GUI module. Key topics include SQL database programming, writing scripts to query and manipulate databases, designing and implementing stored procedures, views, and cursors, as well as creating user-friendly GUI forms and reports. | | | | | |
| CSCI733 | System analysis and Design | 2 | 2 | 3 | CSCI722 |
| The course describes the concepts and methods used in the analysis and design of computer-based information systems. It includes the discussion of typical computer systems life cycles, system requirements and specification, feasibility concerns, system design, fault tolerance, people and interface issues, compliance with ethical and legal standards and quality issues. The laboratory focuses on training the students with hands-on experience Microsoft Visio, drawing DFD, preparing SRS document | | | | | |
| CSC734 | Algorithm Analysis and Design | 3 | 0 | 3 | CSCI711 |
| This course introduces advanced techniques to support the design and analysis of algorithms, focusing on practical considerations of efficiency. Topics include the mathematical tools such as recurrence relations and asymptotic bounds that are necessary for the analysis of algorithm's Time and Space complexity. The various algorithmic design strategies like Brute Force algorithm, Greedy, Divide and Conquer and Dynamic Programming with applications on fundamental computing problems like sorting, searching, decision and optimization. | | | | | |
| CSCI735 | Automata and Formal Languages | 3 | 0 | 3 | MATH622 |
| This course explores advanced concepts in computability theory and mathematical models essential to computer science. It delves into the theoretical foundations of automata theory and formal languages, emphasizing the practical applications and theoretical underpinnings of computational processes. Topics | | | | | |

include deterministic and non-deterministic automata, regular expressions, context-free grammars, Pushdown automata, and their relationships. Students will analyze the capabilities and limitations of regular and context-free languages and apply formal mathematical methods to prove properties of languages, grammars, and automata.

| | | | | | |
|---------|--------------------------------|---|---|---|---------|
| MATH732 | Numerical Methods and Analysis | 2 | 2 | 3 | MATH621 |
|---------|--------------------------------|---|---|---|---------|

This course demonstrates critical knowledge and understanding of specialist theories, principles, and concepts of the study of numerical approximations and errors, numerical solutions of non-linear equations, interpolation and curve fittings, numerical differentiation and integration. The course also covers analysis of accuracy of numerical differentiation and integration methods and solution of initial value problems using Euler Method. Analysis of accuracy of Euler's method. The course also includes laboratory components that make use of MATLAB as tool in solving problems in Numerical Analysis.

THIRD YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|---------------------|---------|---------|--------------|-----------------|
| CSCI811 | Computer Graphics | 2 | 2 | 3 | CSCI721 |
| <p>This course covers the advanced technologies underlying the generation and display of images using computer graphics algorithms. Topics include Geometric primitives its attributes and implementations, 2D and 3D transformations and Viewing and Computer Animation.</p> <p>The Laboratory focus on providing practical experience by using Graphic tools to understand, realize and implement the concepts, theories and models learnt in the lectures.</p> | | | | | |
| CSCI812 | Operating System | 2 | 2 | 3 | CSCI723 |
| <p>This course provides advanced and in-depth knowledge of the components and functionalities of operating systems. Topics include operating system structures, process management and scheduling, memory management, virtual memory, deadlocks, file systems, directory structures, protection, security, distributed operating systems, virtualization, and real-time operating systems (RTOS). Students will explore both foundational principles and modern advancements in operating system design, preparing them to work with contemporary and emerging technologies in the field.</p> <p>In the laboratory component, various operating system commands are demonstrated using Windows and Linux platforms. Algorithms related to scheduling, memory management, and page replacement are implemented using the Java/Python programming language.</p> | | | | | |
| CSCI813 | Computer Networks 2 | 2 | 2 | 3 | CSCI731 |
| <p>This course provides an in-depth and advanced discussion of routing technology. It integrates the core theories, concepts, functions and operations of a router including the principles and applications of routing protocols. Topics include router components and configuration; Unicast and Multicast routing protocols: RIPv1, RIPv2, EIGRP, OSPF and BGP; VLSM and IPv6. The students make use of a range of approaches including the Packet Tracer, GNS3 and the actual network devices in the laboratory in performing advanced and complex network configurations using the different routing protocols and in the critical analysis of network requirements, issues and/or problems.</p> | | | | | |
| CSCI814 | Visual Programming | 2 | 2 | 3 | CSCI733 |
| <p>This course discusses advanced skills needed for software development using Visual Programming tools. It includes programs with graphical interfaces, Visual Basic Controls and Dialog Boxes, Decision Structures, Loops, Classes and Objects, Arrays and Collections and Exceptional Handling and Debugging. Moreover, it</p> | | | | | |



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covers event-driven programming and interaction with databases. The course also provides brief introduction to ASP.Net

The laboratory focuses on training the students with hands-on experience on Visual Studio.Net. The students will gain skills on Visual programming using the Integrated Development Environment (IDE) Visual Studio.

CSCI815

Fundamentals of Cryptography

2

2

3

CSCI731

This course offers a comprehensive introduction to modern cryptographic principles and techniques, integrating both theoretical foundations and practical applications. It begins by establishing the core objectives of cryptography: confidentiality, integrity, authentication, and non-repudiation and explores how various cryptographic methods are designed to achieve these goals. Students will study symmetric and asymmetric encryption schemes, including DES, AES, RSA, Diffie-Hellman, and Elliptic Curve Cryptography (ECC), as well as cryptographic hash functions, digital signatures, and key exchange protocols. Through structured lectures and extensive hands-on lab work using open-source tools such as Python and OpenSSL, students will develop skills to design, implement, and evaluate secure data transmission systems. The course concludes with a lab project and final exam that assess students' understanding of cryptographic algorithms and their ability to apply them effectively in real-world scenarios.

MATH733

Linear Algebra

2

2

3

MATH732

This course use specialist level skills to relate to and adapt main and core theories and concepts in the study of matrices and determinants, and their applications in numerical solutions of systems of linear equations. It also includes important topics such as linear transformations, eigenvalues and eigenvectors, complex vectors and matrices and numerical linear algebra. In the laboratory, MATLAB is use as a mathematical software and solutions to a variety of mathematical problems are determined.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---------------------------------|--------------------|--------------------|-------------------------|------------------------|
| CSCI821 | Theory of Programming Languages | 2 | 2 | 3 | CSCI732 |

This course covers the rigorous comprehensive study of programming languages and the various concepts, which will provide students with a strong foundation in different programming languages. The topics includes advance concepts of language paradigms, language design and implementation issues, related to parallelism.

The laboratory focuses on training the students with hands-on experience in latest trending language.

CSCI822

Statistical Analysis and Data Mining

2

2

3

CSCI732

This course provides an in-depth study of the field of statistical analysis and data mining as it relates to real-world applications. The course explores how the advanced and complex data mining interdisciplinary field brings together techniques from databases, statistics, machine learning, and information retrieval. It covers the field of data mining and includes the topics data preprocessing, predictive modeling, model evaluation techniques, clustering, classification, and association analysis and anomaly detection.

The Laboratory session discusses R data mining tool and using that perform preprocessing, classifications and clustering based on real word data sets.

CSCI823

Software Engineering

2

2

3

CSCI733

This course demonstrates the concepts in software design paradigms; identify software requirements and of latest trends in designing and developing efficient software applications. The course covers an in-depth survey of software process models, analysis and design methods, reliability, maintenance and metrics.

The laboratory focuses on providing students with hands-on experience using different tools to design a mini project.

CSCI824

Web Technologies 2

2

2

3

CSCI724

This course provides in-depth knowledge and practical experience in designing and developing dynamic, database-driven web applications using open-source technologies. Emphasis is placed on both client-side



and server-side scripting, web application architecture, data persistence, and user interface design. Students will also explore content management systems (CMS), modern development tools, and collaborative open-source practices. Through hands-on labs using technologies such as PHP, MySQL, PostgreSQL, Apache, and AJAX, students will build and deploy fully functional web applications.

| | | | | | |
|---------|----------------------------|---|---|---|---------|
| CSCI825 | Human Computer Interaction | 3 | 0 | 3 | CSCI733 |
|---------|----------------------------|---|---|---|---------|

The course provides techniques used to analyze and design Human-Computer Interaction (HCI) systems. Topics include usability principles, user-centered design, usability testing, accessibility, interaction design, visual design, and the impact of emerging technologies on HCI.

| | | | | | |
|---------|----------------------|---|---|---|---------|
| MATH821 | Optimization Methods | 3 | 0 | 3 | MATH732 |
|---------|----------------------|---|---|---|---------|

The course takes an advanced and unified view of optimization and covers the main areas of application of core optimization algorithms. The topics include linear optimization, robust optimization, network flows, dynamic optimization and non-linear optimization.

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|------------------------------------|---------|---------|--------------|-----------------|
| CSCI831 | Software Quality Assurance | 3 | 0 | 3 | CSCI733 |
| This course provides a comprehensive introduction to Software Quality Assurance (SQA) and Testing. Students will learn about the fundamental principles and practices of testing, the various levels and types of tests, and the role of testing within the Software Development Life Cycle (SDLC). The course covers both manual and automated testing techniques, emphasizing practical skills and real-world applications. | | | | | |
| CSCI832 | Parallel and Distributed Computing | 2 | 2 | 3 | CSCI813 |
| This course provides an overview of distributed and parallel systems, with special emphasis on cloud-based implementations. Topics include distributed systems and models, computer clusters for scalable parallel computing, virtual machines, cloud platform architecture, service-oriented architectures, grid computing, and peer-to-peer computing. The Laboratory exercises will be used to demonstrate various aspects of parallel and distributed computing using MS MPI. | | | | | |
| CSCI833 | Software Project Management | 2 | 2 | 3 | CSCI733 |
| This course focuses on the advanced management and development of software project management techniques and methods. It covers project definition, project scheduling, team management, software measurement and estimation techniques, risk analysis, project management tools and software process models, process measurement, software project planning, cost estimation and scheduling, project management tools, factors influencing productivity and success. Furthermore, it covers the software process standards and process implementation, software contracts and intellectual property and approaches to maintenance and long-term software development. In the laboratory focuses on training the students with hands-on experience on project management tools | | | | | |
| CSCI834 | Cyber security | 3 | 0 | 3 | CSCI813 |
| This course is designed to provide concepts and practices cyber security with sufficient coverage of essential topics required for entry-level cyber security certifications. An effective cyber security defense consists of four distinct challenges: securing the infrastructure, securing devices, securing local networks, and securing the perimeter. Overcoming these challenges requires a detailed understanding of the concepts and practices within each realm. This course covers each challenge individually for greater depth of information, with real- | | | | | |

world scenarios that show what vulnerabilities look like in everyday computing scenarios.

| | | | | | |
|---------|-----------------|---|---|---|---------|
| CSCI835 | Cloud Computing | 3 | 0 | 3 | CSCI813 |
|---------|-----------------|---|---|---|---------|

This course covers advanced concepts required to build a cloud infrastructure based on a cloud computing reference model. The reference model includes five fundamental layers, namely, physical, virtual, control, and service and three cross-layer functions, namely business continuity, security, and service management for building a Cloud infrastructure. Furthermore, Topics included Cloud infrastructure reference model, resource management, programming models, application models, system characterizations, and implementations, deployment of Cloud computing systems. Moreover, this course takes an open approach to describe concepts and technologies.

FOURTH YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|--------------------------------|---------|---------|--------------|-----------------|
| CSCI841 | Mobile Application Development | 2 | 2 | 3 | CSCI825 |
| This course provides a systematic explanation of advanced concepts in mobile programming and provide an in-depth coverage of mobile systems and it application development. It includes the mobile user interface, application development standards and mobile technology. Moreover, it covers various mobile computing applications using common paradigms in mobile application frameworks and development environments. The Lab component of the course includes developing apps based on UI widgets, custom views and layouts, notification, toast, menus, dialog, list and data storage using flutter. | | | | | |
| CSCI842 | Internship | 0 | 1 | 6 | CSCI833 |
| This course provides the students with an opportunity to be immersed in the actual work environment along their specialization. The students are required to complete 240 hours on-site training to get hands on experience of working in the industry. | | | | | |
| CSCI843 | Software Project A | 3 | 0 | 3 | CSCI833 |
| This course provides guidelines that will enable the students to effectively prepare a research project in relation to their field of specialization. It deals with the development of the essential ideas, concepts, principles, tools, and skills needed for developing a research project. All stages of project development should be emphasized including problem identification, literature review, planning, design and on completion, the student must submit a final written report outlining the various phases of the project and make an oral presentation | | | | | |
| CSCI844 | Ethical Hacking | 2 | 2 | 3 | CSCI813 |
| This course provides a comprehensive introduction to the field of cyber security and ethical hacking. It covers essential concepts, methodologies, and tools used in the industry to safeguard digital systems and networks from malicious attacks. Students will gain both theoretical knowledge and practical skills, enabling them to identify, analyze, and mitigate various security threats. Through interactive lectures, hands-on lab sessions, and collaborative projects, the course emphasizes active and engaged learning, problem-solving, and the application of industry standards and best practices. | | | | | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|--------------|---------|---------|--------------|-----------------|
|-------------|--------------|---------|---------|--------------|-----------------|

| | | | | | |
|--|--|---|---|---|---------|
| CSCI851 | Bigdata Analytics | 2 | 2 | 3 | CSCI822 |
| <p>This course provides fundamental concepts related to big data and analytics. This course will explore the theory and applications of big data and demonstrate the process from data to decisions. Students will learn big data in various formats, data processing platforms and data analytics tools to transform, visualize, model, and communicate the insights hidden in the data, providing end users with timely knowledge to support decision making. The course will explain the challenges the organizations are facing with managing big data.</p> | | | | | |
| CSCI852 | Artificial Intelligence and Machine Learning | 2 | 2 | 3 | CSCI821 |
| <p>This course covers advanced theories and state-of-the-art techniques of artificial intelligence. Artificial intelligence (AI) is a research field that studies how to realize intelligent human behaviors on computers. The AI is to make a computer that can learn, plan, and solve problems autonomously. The topic includes building blocks and components of artificial intelligence, learning about concepts like algorithms, machine learning, and neural networks.</p> <p>The laboratory focuses on training the students with building models using various artificial intelligence algorithms.</p> | | | | | |
| CSCI853 | Software Project B | 3 | 0 | 3 | CSCI843 |
| <p>This course provides opportunity to students to integrate their knowledge by implementing a significant software system as part of a systems development project including proper documentation in a real world environment.</p> | | | | | |
| CSCI854 | Special Topics in Computing | 3 | 0 | 3 | CSCI835 |
| <p>This course provides applications of various trending topics in computing, theoretical advanced knowledge on current trends, issues, and development in the field of Information Technology to make aware of the changes in technologies, applications and systems. This course help students in research in latest topics, or implementation of software system using latest technologies or understand the research trends in research contributions.</p> | | | | | |
| CSCI855 | Technopreneurship | 3 | 0 | 3 | CSCI824 |
| <p>This course discusses the rapid evolving world on creative new ventures in internet marketing. The road to entrepreneurial success is long, winding and strewn with pitfalls, obstacles and blind turns. This course is intended to give an understanding of technopreneurship fundamentals. The topics covered include in information age, developing business plans, financing and marketing business, innovation and creativity, financial management, and products identification. Students will be exposed to various case studies on successful entrepreneurs.</p> | | | | | |

ELECTIVES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|--------------|---------|---------|--------------|-----------------|
| CSCI880A | AR VR Tech | 2 | 2 | 3 | CSCI825,CSCI813 |
| <p>In this course, students will learn & practice about the revolutionary medium of XR. Learn to create immersive experiences that inform, educate, entertain, and change the way we think about industries including Aerospace, Defense, Energy, Healthcare, Manufacturing and more. Students will be introduced to the core fundamentals of XR development engine & software and practical implementations of 3D graphics, OpenGL ES, AR, VR & MR which will prepare them to design and develop immersive XR apps & Solutions. After an introduction to the fundamentals, intermediate concepts will be learned by working through a XR project.</p> | | | | | |

| | | | | | |
|--|---|---|---|---|-----------------|
| CSCI880B | Software Analysis and Testing Tools | 2 | 2 | 3 | CSCI825,CSCI813 |
| <p>This course demonstrates the advanced concepts in software testing paradigms; identify software test requirements and of latest trends in designing and developing efficient software application. The course covers an in-depth survey of software testing, reliability, maintenance and metrics.</p> <p>The laboratory focuses on providing students with hands-on experience using different tools to design test cases.</p> | | | | | |
| CSCI880C | Embedded System | 2 | 2 | 3 | CSCI825,CSCI813 |
| <p>This course provides critical knowledge and understanding of real time embedded systems design, development and implementation. It includes embedded system types, microcontroller architecture, programming, digital and analog I/O interfacing, parallel interfacing, interrupt and timers management, and communication interfaces. Through laboratory and in- course project, the students will creatively implement complex applications of real time embedded systems.</p> | | | | | |
| CSCI882A | Internet of Things | 2 | 2 | 3 | CSCI834,CSCI831 |
| <p>This course discusses the advanced and current leading IoT technologies for building IoT solutions for Smart Homes, Smart Campus etc., using IoT sensor, actuators, and devices. It covers key concepts of IoT (Internet of Things) and challenges related to digital transformation, security and privacy. The course examines the evolution of the Internet and how the interconnection of people, processes, data, and things are transforming every industry.</p> | | | | | |
| CSCI882B | Wireless and Mobile Networks | 2 | 2 | 3 | CSCI834,CSCI831 |
| <p>This course provides engineering, computer science, and cybersecurity students with the theoretical knowledge and practical skills needed to design, secure, and defend modern wireless networks. Students will explore wireless communication fundamentals with a strong emphasis on security threats, encryption protocols, intrusion detection systems, and secure network design. Through hands-on labs, penetration testing exercises, and real-world case studies, students will learn to identify vulnerabilities, implement defense mechanisms, and conduct wireless security audits. The course also covers emerging technologies such as Wi-Fi 6/7, IoT wireless systems, and AI-driven security monitoring, preparing students for both academic advancement and industry-recognized certifications.</p> | | | | | |
| CSCI882C | E-Commerce Infrastructure and Application | 3 | 0 | 3 | CSCI834,CSCI831 |
| <p>This course covers the electronic commerce elements, types, models, development process, applications, services, and technologies which are used to conduct business on the World Wide Web. It focuses on the three major driving forces that permeate all aspects of e-commerce: business development and strategy, technological innovations, and the social and legal issues and impacts. It also deals with the advantages and challenges related to integrating e-commerce applications to business.</p> | | | | | |

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| | |
|---|--|
| 1. Teaching Institution | University of Technology Bahrain (UTB) |
| 2. University Department | College of Computer Studies (CCS) |
| 3. Programme/ Qualification Title | Bachelor of Science in Information Technology (BSIT) |
| 4. Title of Final Award | Bachelor of Science in Information Technology (BSIT) |
| 5. Mode of Attendance | Actual classroom learning-interactive (Full-time) |
| 6. Delivery Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | Level 8 540 Credits units (180 ACS CREDITS) |
| 8. Accreditation | None |
| 9. Other external influences | Local External Influences/References <ul style="list-style-type: none"> - Ministry of Education (MOE) - Higher Education Council (HEC) - Education and Training Quality Authority (BQA) International External Influences/References <ul style="list-style-type: none"> - ABET Computing Accreditation Commission (ABET-CAC) - Association for Computing Machinery (ACM) in Computing - Quality Assurance Accreditation (QAA) in Computing |
| 10. Date of production/revision of this specification | September, 2025 |
| 11. Aims of the Programme | |
| <p>The BSIT Programme prepares students to take a leading role in Information Technology by equipping them with the needed knowledge and competencies to effectively evaluate, manage, and maintain computing resources. It has strong emphasis on knowledge to successfully apply information technology theory and principles to address real world opportunities and challenges. The curriculum covers various IT domains which include Information management, Integrated systems, Platform technologies, System paradigm, Networking, User experience design, Software Development, Web and Mobile systems and Project Management. BSIT course is offered with three Majors: Major in Networking and Cyber Security, Major in Data Analytics and Artificial Intelligence and Major in Applications Development.</p> <p>The Programme Educational Objectives:</p> <ol style="list-style-type: none"> 1. Apply knowledge to effectively analyze and assess real life problems to develop economically viable and socially acceptable IT solutions. 2. Demonstrate excellence in professionalism, moral and ethical conduct, interpersonal skills and adaptable communication to prevalent trends in technology and changing technology 3. Work productively as successful IT professionals in diverse career paths including supportive and leadership roles on multidisciplinary teams or be active in higher studies. | |
| 12. Programme Intended Learning Outcomes | |

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Use systematic approaches to select, develop, apply, integrate and administer secure computing technologies to accomplish user goals.

Teaching and Learning Methods

- Constructive Method: Students are required to attend the sessions regularly. Students learn by doing, writing, and solving. Active participation of the student's during discussion is expected. Learning is an active process, and as such, students must engage with the course materials, i.e. reading the textbook and other assigned advanced readings.
- Inquiry based Method: After each topic, sample problems will be provided to students. Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem.
- Collaborative Method: Students will be divided into groups with at least three (2) members and each group will be provided with problems or projects that they will work on together to search for understanding, meaning, or solutions Each group is expected to work together in solving Computing problems, discuss the algorithm of the problems, and present the solution in class.
- Experiential learning Method: Engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. During laboratory hours, students will be given experiments to work in groups where they can apply the theories and principles learned. This is an opportunity to have hands-on experience and maximize their learning through actual simulation. This may include team challenges, simulations, company visits/fieldworks and other extracurricular activities.

Assessment Methods

Assessment is through a combination of written examinations (essays, class tests, and homework) and assessed coursework (written reports, software demonstration and computer program/ software development project / programming exercises), oral presentations and interpersonal communication assessed through group projects.

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13. Programme Structure

BACHELOR OF SCIENCE INFORMATION TECHNOLOGY (BSIT)
CURRICULUM PLAN EFFECTIVE AY2022-2023

FOUNDATION CLASSES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|---------------------------|---------|---------|--------------|----------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PRE-REQUISITES |
|--------------|----------------------------------|---------|---------|--------------|----------------|
| CSIT611 | Introduction to Computers and IT | 2 | 2 | 3 | |
| ENGL611 | English Communication Skills 1 | 3 | 0 | 3 | |
| ARAB600 | Arabic Language | 3 | 0 | 3 | |
| EUTH400 | Euthenics1 | 1 | 0 | 0 | |
| MATH611 | College Algebra | 3 | 0 | 3 | |
| ECON600 | Introduction to Economics | 3 | 0 | 3 | |
| HUMR600 | Human Rights | 3 | 0 | 3 | |
| Total | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--------------|-----------------------------------|---------|---------|--------------|----------------|
| CSIT621 | Computer Programming 1 | 2 | 2 | 3 | CSIT611 |
| CSIT622 | Multimedia Development | 2 | 2 | 3 | CSIT611 |
| CSIT623 | Digital Design | 2 | 2 | 3 | CSIT611 |
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
| EUTH401 | Euthenics2 | 1 | 0 | 0 | EUTH400 |
| MATH622 | Discrete Mathematics | 3 | 0 | 3 | MATH611 |
| HIST600 | History of Bahrain and GCC Region | 3 | 0 | 3 | |
| Total | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|--|---------|---------|--------------|----------------|
| CSIT631 | Computer Programming 2 | 2 | 2 | 3 | CSIT621 |
| CSIT632 | Web Content Management | 1 | 2 | 2 | CSIT611 |
| CSIT633 | Introduction to Green Computing | 3 | 0 | 3 | CSIT611 |
| CSIT634 | Computer Organization and Architecture | 2 | 2 | 3 | CSIT623 |
| MATH631 | Calculus 1 | 5 | 0 | 5 | MATH611 |

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| | | | | | |
|--------------|-------------------------------|---|---|-----------|---------|
| ENGL631 | Speech and Oral Communication | 2 | 2 | 3 | ENGL621 |
| Total | | | | 19 | |

SECOND YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--------------|---|---------|---------|--------------|----------------|
| CSIT711 | Web Design Techniques and Tools | 2 | 2 | 3 | CSIT632 |
| CSIT712 | Data Structures | 2 | 2 | 3 | CSIT621 |
| CSIT713 | Data Communications and Networking 1 | 2 | 2 | 3 | CSIT634 |
| CSIT714 | Professional Ethics in IT | 2 | 0 | 2 | CSIT611 |
| CSIT715 | Introduction to Management Information System | 3 | 0 | 3 | CSIT611 |
| MATH621 | Probability and Statistics | 3 | 0 | 3 | MATH631 |
| Total | | | | 17 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--------------|--------------------------------------|---------|---------|--------------|----------------|
| ENGL711 | Technical Writing | 3 | 0 | 3 | ENGL621 |
| CSIT721 | Database Management Systems 1 | 2 | 2 | 3 | CSIT712 |
| CSIT722 | Operating Systems | 2 | 2 | 3 | CSIT712 |
| CSIT723 | Data Communications and Networking 2 | 2 | 2 | 3 | CSIT713 |
| CSIT724 | System Administration | 2 | 2 | 3 | CSIT634 |
| CSIT725 | Technopreneurship | 3 | 0 | 3 | CSIT715 |
| Total | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--------------|---|---------|---------|--------------|------------------|
| CSIT731 | Blockchain Technology and Application | 3 | 0 | 3 | CSIT713 |
| CSIT732 | System Analysis and Design | 2 | 2 | 3 | CSIT721 |
| CSIT733 | IT Project Management | 2 | 2 | 3 | CSIT715 |
| CSIT734 | Cyber Security for Information Technology | 3 | 0 | 3 | CSIT713 |
| CSIT735 | Cryptographic Algorithms | 3 | 0 | 3 | CSIT713 |
| CSIT736 | Specialization Elective 1 | | | 3 | Check list below |
| Total | | | | 18 | |

THIRD YEAR

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FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--------------|-------------------------------------|---------|---------|--------------|------------------|
| CSIT811 | Software Design and Development | 2 | 2 | 3 | CSIT732 |
| CSIT812 | Human Computer Interaction | 3 | 0 | 3 | CSIT732 |
| CSIT813 | Information Security and Governance | 2 | 2 | 3 | CSIT714 |
| CSIT814 | Specialization Elective 2 | | | 3 | Check list below |
| CSIT815 | Specialization Elective 3 | | | 3 | Check list below |
| CSIT816 | Specialization Elective 4 | | | 3 | Check list below |
| Total | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--------------|---------------------------|---------|---------|--------------|------------------|
| CSIT821 | System Integration | 3 | 0 | 3 | CSIT811 |
| CSIT822 | Embedded System | 3 | 0 | 3 | CSIT634 |
| CSIT823 | Mobile Programming | 2 | 2 | 3 | CSIT812 |
| CSIT824 | Specialization Elective 5 | | | 3 | Check list below |
| CSIT825 | Specialization Elective 6 | | | 3 | Check list below |
| CSIT826 | Specialization Elective 7 | | | 3 | Check list below |
| Total | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--------------|-----------------------------------|---------|---------|--------------|------------------|
| CSIT831 | Practicum in IT | 0 | 12 | 6 | CSIT821 |
| CSIT832 | Research Project A | 3 | 0 | 3 | CSIT823 |
| CSIT833 | Elective – 1 : Software Expertise | 2 | 2 | 3 | CSIT821 |
| CSIT834 | Specialization Elective 8 | | | 3 | Check list below |
| CSIT835 | Specialization Elective 9 | | | 3 | Check list below |
| Total | | | | 18 | |

FOURTH YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--------------|---------------------------------|---------|---------|--------------|------------------|
| CSIT841 | Internet of Things | 3 | 0 | 3 | CSIT723 |
| CSIT842 | Research Project B | 3 | 0 | 3 | CSIT832 |
| CSIT843 | Elective 2: Intelligent Systems | 2 | 2 | 3 | MATH621 |
| CSIT844 | Specialization Elective 10 | | | 3 | Check list below |
| CSIT845 | Specialization Elective 11 | | | 3 | Check list below |
| CSIT846 | Specialization Elective 12 | | | 3 | Check list below |
| Total | | | | 18 | |

ELECTIVE COURSES**Elective 1 - Software Expertise**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|------------------------------------|---------|---------|--------------|----------------|
| CSIT833- A | Parallel and Distributed Computing | 2 | 2 | 3 | CSIT821 |
| CSIT833 - B | Enterprise Resource Planning | 2 | 2 | 3 | CSIT821 |
| CSIT833 - C | Compiler Construction | 2 | 2 | 3 | CSIT821 |

Elective – 2 Intelligent Systems

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|--|---------|---------|--------------|----------------|
| CSIT843 – A | Artificial Intelligence and Machine Learning | 2 | 2 | 3 | MATH621 |
| CSIT843 - B | Expert Systems | 2 | 2 | 3 | MATH621 |
| CSIT843 - C | Principles of Data Science | 2 | 2 | 3 | MATH621 |

SPECIALIZATION ELECTIVES

| Networking and Cyber Security Specialization (CS) | | | | | |
|--|--|---------|---------|--------------|---------------|
| COURSE CODE | COURSE TITLE | LEC HRS | LAB HRS | CREDIT UNITS | PRE-REQUISITE |
| CSIT736 – CS | Introduction to Digital Forensics | 3 | 0 | 3 | CSIT722 |
| CSIT814 – CS | Network Security | 2 | 2 | 3 | CSIT723 |
| CSIT815 – CS | Security Methods and Practices | 3 | 0 | 3 | CSIT724 |
| CSIT816 – CS | Ethical Hacking | 2 | 2 | 3 | CSIT736-CS |
| CSIT824 – CS | Wireless Networks | 2 | 2 | 3 | CSIT723 |
| CSIT825 – CS | System and Security Administration | 2 | 2 | 3 | CSIT724 |
| CSIT826 – CS | Intrusion Detection and Prevention Systems | 2 | 2 | 3 | CSIT736-CS |
| CSIT834 – CS | Cloud Computing | 3 | 0 | 3 | CSIT826-CS |
| CSIT835 – CS | Applied Cyber Security | 3 | 0 | 3 | CSIT734 |
| CSIT844 – CS | Advanced Cryptographic Algorithms | 2 | 2 | 3 | CSIT735 |
| CSIT845 – CS | TCP/IP and Routing | 2 | 2 | 3 | CSIT723 |
| CSIT846 – CS | Mobile Internet Technology | 3 | 0 | 3 | CSIT824-CS |
| Data Analytics and Artificial Intelligence Specialization (DA) | | | | | |
| COURSE CODE | COURSE TITLE | LEC HRS | LAB HRS | CREDIT UNITS | PRE-REQUISITE |
| CSIT736 – DA | Database Management Systems 2 | 2 | 2 | 3 | CSIT721 |
| CSIT814 – DA | Data Integration | 2 | 2 | 3 | CSIT721 |
| CSIT815 – DA | Database Administration | 2 | 2 | 3 | CSIT721 |

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| | | | | | |
|--------------|--|---|---|---|------------|
| CSIT816 – DA | Data Mining and Analysis in Information Technology | 2 | 2 | 3 | CSIT721 |
| CSIT824 – DA | Web mining and Information Retrieval | 2 | 2 | 3 | CSIT816-DA |
| CSIT825 – DA | Big Data Analytics in Business Intelligence | 2 | 2 | 3 | CSIT816-DA |
| CSIT826 – DA | Big Data Architecture and Design | 2 | 2 | 3 | CSIT816-DA |
| CSIT834 – DA | Cloud Based Data Distribution and Virtualization | 3 | 0 | 3 | CSIT731 |
| CSIT835 – DA | Principles of Data Science and Visualization | 2 | 2 | 3 | CSIT825-DA |
| CSIT844 – DA | Computational Thinking with Python | 2 | 2 | 3 | CSIT736-DA |
| CSIT845 – DA | Data Interpretation and Statistical Analysis in Information Technology | 3 | 0 | 3 | CSIT816-DA |
| CSIT846 – DA | Database Driven Web Applications | 2 | 2 | 3 | CSIT736-DA |

Applications Development Specialization (AD)

| COURSE CODE | COURSE TITLE | LEC HRS | LAB HRS | CREDIT UNITS | PRE-REQUISITE |
|--------------|--|---------|---------|--------------|---------------|
| CSIT736 – AD | Database Management Systems 2 | 2 | 2 | 3 | CSIT721 |
| CSIT814 – AD | Python Programming | 2 | 2 | 3 | CSIT736-AD |
| CSIT815 – AD | Database Administration | 2 | 2 | 3 | CSIT721 |
| CSIT816 – AD | Agile Project Management | 3 | 0 | 3 | CSIT733 |
| CSIT824 – AD | C# Programming and Application development | 2 | 2 | 3 | CSIT736- AD |
| CSIT825 – AD | Mobile Application Development | 2 | 2 | 3 | CSIT823 |
| CSIT826 – AD | Computer Graphics and Applications | 2 | 2 | 3 | CSIT722 |
| CSIT834 – AD | Cloud Computing | 3 | 0 | 3 | CSIT731 |
| CSIT835 – AD | Server Side Programming | 2 | 2 | 3 | CSIT736-AD |
| CSIT844 – AD | Software Quality Assurance | 3 | 0 | 3 | CSIT811 |
| CSIT845 – AD | .Net Technologies | 2 | 2 | 3 | CSIT812 |
| CSIT846 – AD | Software Testing Tools | 2 | 2 | 3 | CSIT811 |

14. Awards and Credits

| | |
|-----------------------------|---|
| Degree/ Certificate Awarded | Bachelor of Science in Information Technology |
| Total Units for Degree | 180 ACS (540 NQF Credits) |
| Total Trimesters Completed | 10 |

15. Admission Criteria

D. Admissions Criteria for Undergraduate Students

E. For First Year Undergraduate Applicants

Acceptance to the University depends on the following admissions requirements:

13. Completely filled out an admission application form.
14. Minimum secondary school scores 60% or its equivalent.
15. Online Placement test (Oxford Online Placement Test (OOPT)) Result (if needed)
16. Submission of all required documents stated in the Admissions Policy.



To be admitted to any undergraduate programme, the applicant must satisfy the minimum secondary school grades or its equivalent without the need to take the remediation classes of English and Math, as shown in the following table:

| Subtest Component for Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification | | BSIT |
|---|--|-------------------|
| Mathematics | Science/ Technical/General Track | At least 70% or C |
| | Commercial Track | At least 80% or B |
| | Literature, Islamic and non-technical Tracks | At least 80% or B |
| Science | - | 60 |
| English | - | At least 80 or B |

*This is applicable to Bahraini and similarly equivalent qualification

4. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program.

| Subtest Component for Other Qualification (Indian, Pakistan, and West African) | | BSIT |
|---|--|-------------------|
| Mathematics | Science/ Technical/General Track | At least 51 or C1 |
| | Commercial Track | At least 71 or B1 |
| | Literature, Islamic and non-technical Tracks | At least 71 or B1 |
| Science | - | 60 |
| English | - | At least 71 or B1 |

*Note: Science component is subject to the evaluation of the Dean.

For the undergraduate applicant who did not meet the minimum required secondary school grades in Mathematics and English or its equivalent, his/her admissions depend on the following criteria:

| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|------------------|--|---|--|
| All Programmes | 60-79 % grade in English | Score \geq 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| BSIT | For Commercial, Literature, Islamic and non-technical Track: Score 50-79% in Math For Scientific, General, and | N/A | Foundation Course in Math |



| | | | |
|----------------|---|-----|---|
| | technical Track: Score 50-69% in Math | | |
| | For Science score <60% | N/A | Tutorial class in general sciences |
| All Programmes | CGPA <60% for Bahraini and KSA CGPA <41% for Indian and Pakistan | N/A | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

p. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

q. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program (English Foundation).

r. IELTS/TOEFL

Applicants who submit official IELTS or TOEFL certificates issued by accredited examination centers, with a minimum score of 450 on the TOEFL (paper-based), 131 on the TOEFL (computer-based), or 5.0 on the IELTS, are exempted from taking the required English Placement Test.

In addition, applicants who obtain an IELTS score of 5.5 or higher or a TOEFL score that meets the equivalent standard may qualify for English course exemptions based on their results. This policy recognizes academic achievement by allowing eligible students to be exempted from enrolling in introductory English courses upon admission.

| IELTS/TOEFL Scores | Exemption |
|---|---|
| Qualified applicants with 5.5 IELTS scores or TOEFL: 496 (paper-based) or 169 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 (English Communication Skills 1) |
| Qualified applicants with 6.0 IELTS scores or TOEFL: 546 (paper-based) or 211 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 and ENGL402/ENGL621 (English Communication Skills 1 and 2) |



s. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature, Islamic and non-technical tracks must take the remediation course in Math.

t. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

B. For Undergraduate Transfer Student Applicants

Application Requirements:

25. Completely filled out an admission application form
26. Official Transcript of Records (TOR) from the university previously attended. Rules and regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school certificates are to be applied when necessary.
27. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
28. Certificate of Transfer from the university previously attended stamped by MOE, if any.
29. Withdrawal Certificate stamped by MOE
30. Submission of all required documents stated in the admissions policy.

Admissions Requirements:

13. For Bahrain and KSA qualifications, the applicant should have at least a secondary school average of 60%. For non-Bahrain secondary qualifications (Indian and Pakistan) the applicant should have at least 41% secondary school average; and for other non-Bahraini qualifications please refer to the table of cut-off.
14. If the applicant has taken and passed courses in English and Mathematics in the previous university, the applicant will be exempted in taking the remedial courses in both English and Mathematics. The applicant may proceed to mainstream university courses and is eligible to apply for credit transfer.
15. If the applicant has not taken any course in English and Mathematics, the basis for evaluation



whether remedial course in English and mathematics is required or not is the subject scores in his/her last year in the secondary school certificate using the table presented earlier.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. Practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or re-admitted student from UTB.

The University requires the undergraduate student to complete at least 50% of the required credit units/hours of a programme in residence at UTB. The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit units/hours based on his/her original degree from another university.

16. CGPA Requirement for Graduation

The required CGPA for an undergraduate student to be eligible for graduation is 2.0 out of 4.0

17. Career Pathways

The BSIT major in Applications Development, Networking and Cybersecurity, and Data Analytics and Artificial Intelligence graduates can work in either public or private sectors as network and system administrator, computer system analyst/manager, information security analyst/manager, computer network designer and architects, software application developer, web developer and IT business intelligence analyst. In addition, they can pursue postgraduate degrees in information technology and teach at universities.

18. BSIT CURRICULUM SKILLS MAPPING

| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Learning Outcomes | | | | | |
|-----------------------------------|-------------|---------------------------------------|-----------------------------|-----------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Year 1 1st Tri | ENGL611 | English Communication Skills1 | (C) | | | ✓ | | | |
| | MATH611 | College Algebra | (C) | ✓ | | | | | |
| | ARAB600 | Arabic Studies | (C) | | | ✓ | | | |
| | EUTH400 | Euthenics1 | (C) | | | | | | |
| | ECON600 | Introduction to Economics | (C) | ✓ | | | | | |
| | HUMR600 | Human Rights | (C) | | | | ✓ | | |
| | MATH401 | COLLEGE ALGEBRA | (C) | ✓ | | | | | |
| Year 1 2nd Tri | CSIT611 | Introduction to Computers and IT | (C) | ✓ | ✓ | | | | |
| | ENGL621 | English Communication Skills2 | (C) | | | ✓ | | | |
| | EUTH401 | Euthenics2 | (C) | | | | | | |
| | MATH622 | Discrete Mathematics | (C) | ✓ | | | | | |
| | HIST600 | History of Bahrain and the GCC Region | (C) | | | | ✓ | | |
| | CSIT621 | Computer Programming1 | (C) | ✓ | ✓ | | | | ✓ |

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18. BSIT CURRICULUM SKILLS MAPPING

| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Learning Outcomes | | | | | |
|-----------------------------|-------------|---|-----------------------------|-----------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| | CSIT622 | Multimedia Development | (C) | | ✓ | | | ✓ | |
| | CSIT623 | Digital Design | (C) | ✓ | ✓ | | | | |
| Year 1 3rd Tri | ENGL631 | Speech and Oral Communication | (C) | | | ✓ | | | |
| | MATH631 | Calculus 1 | (C) | ✓ | | | | | |
| | CSIT631 | Computer Programming2 | (C) | ✓ | ✓ | | ✓ | | ✓ |
| | CSIT632 | Web Content Management | (C) | | ✓ | ✓ | | ✓ | |
| | CSIT633 | Introduction to Green Computing | (C) | ✓ | ✓ | | | | |
| | CSIT634 | Computer Organization and Architecture | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Year 2 1st Tri | MATH621 | Probability and Statistics | (C) | ✓ | | | | | |
| | CSIT711 | Web Design Techniques and Tools | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT712 | Data Structures | (C) | ✓ | ✓ | ✓ | | | ✓ |
| | CSIT713 | Data Communications and Networking 1 | (C) | ✓ | | | | ✓ | ✓ |
| | CSIT714 | Professional Ethics in IT | (C) | | | | ✓ | | |
| | CSIT715 | Introduction to Management Information System | (C) | ✓ | ✓ | ✓ | ✓ | | |
| Year 2 2nd Tri | ENGL711 | Technical Writing | (C) | | | ✓ | | | |
| | CSIT721 | Database Management Systems 1 | (C) | ✓ | ✓ | | | ✓ | ✓ |
| | CSIT722 | Operating Systems | (C) | ✓ | ✓ | | | ✓ | ✓ |
| | CSIT723 | Data Communications and Networking 2s | (C) | ✓ | ✓ | | | ✓ | ✓ |
| | CSIT724 | System Administration | (C) | ✓ | ✓ | | | ✓ | ✓ |
| | CSIT725 | Technopreneurship | (C) | ✓ | | ✓ | | ✓ | |
| Year 2 3rd Tri | CSIT731 | Blockchain technology and Application | (C) | ✓ | ✓ | | | | ✓ |
| | CSIT732 | System Analysis and Design | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT733 | IT Project Management | (C) | ✓ | | | ✓ | ✓ | |
| | CSIT734 | Cyber Security for Information Technology | (C) | ✓ | ✓ | ✓ | | | ✓ |
| | CSIT735 | Cryptographic Algorithms | (C) | ✓ | ✓ | ✓ | | | |
| | CSIT736 | Specialization Elective 1 | (E) | | | | | | |
| Year 3 1st Tri | CSIT811 | Software Design and Development | (C) | ✓ | ✓ | | | | ✓ |
| | CSIT812 | Human-Computer Interaction | (C) | ✓ | | ✓ | | ✓ | |
| | CSIT813 | Information Security and Governance | (C) | ✓ | | ✓ | ✓ | ✓ | |
| | CSIT814 | Specialization Elective 2 | (E) | | | | | | |
| | CSIT815 | Specialization Elective 3 | (E) | | | | | | |

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18. BSIT CURRICULUM SKILLS MAPPING

| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Learning Outcomes | | | | | |
|--|--------------|--|-----------------------------|-----------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| | CSIT816 | <i>Specialization Elective 4</i> | (E) | | | | | | |
| Year 3 2nd Tri | CSIT821 | System Integration | (C) | ✓ | ✓ | | | ✓ | ✓ |
| | CSIT822 | Embedded Systems | (C) | ✓ | ✓ | | ✓ | | |
| | CSIT823 | Mobile Programming | (C) | ✓ | ✓ | ✓ | | | ✓ |
| | CSIT824 | <i>Specialization Elective 5</i> | (E) | | | | | | |
| | CSIT825 | <i>Specialization Elective 6</i> | (E) | | | | | | |
| | CSIT826 | <i>Specialization Elective 7</i> | (E) | | | | | | |
| Year 3 3rd Tri | CSIT831 | Practicum in IT | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | CSIT832 | Research Project A | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | CSIT833 | <i>Elective 1</i> | (E) | | | | | | |
| | CSIT835 | <i>Specialization Elective 8</i> | (E) | | | | | | |
| | CSIT836 | <i>Specialization Elective 9</i> | (E) | | | | | | |
| Year 4 1st Tri | CSIT841 | Internet of Things | (C) | ✓ | ✓ | | ✓ | | |
| | CSIT842 | Research Project B | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | CSIT843 | <i>Elective 2</i> | (E) | | | | | | |
| | CSIT844 | <i>Specialization Elective 10</i> | (E) | | | | | | |
| | CSIT845 | <i>Specialization Elective 11</i> | (E) | | | | | | |
| | CSIT846 | <i>Specialization Elective 12</i> | (E) | | | | | | |
| COMPULSORY ELECTIVES | | | | | | | | | |
| Elective 1 | CSIT833 – A | Parallel and Distributed Computing | (E) | ✓ | | ✓ | | | ✓ |
| | CSIT833 – B | Enterprise Resource Planning | (E) | ✓ | ✓ | | | ✓ | |
| | CSIT833 – C | Compiler Construction | (E) | ✓ | | ✓ | ✓ | | ✓ |
| Elective 2 | CSIT843 – A | Artificial Intelligence and Machine Learning | (E) | ✓ | | ✓ | | ✓ | ✓ |
| | CSIT843 – B | Expert Systems | (E) | ✓ | | ✓ | | ✓ | ✓ |
| | CSIT843 – C | Principles of Data Science | (E) | ✓ | ✓ | | | | ✓ |
| SPECIALIZATION ELECTIVES | | | | | | | | | |
| Networking and Cyber Security Specialization (CS) | CSIT736 – CS | Introduction to Digital Forensics | (E) | ✓ | ✓ | | | ✓ | ✓ |
| | CSIT814 – CS | Network Security | (E) | ✓ | ✓ | ✓ | | | |
| | CSIT815 – CS | Security Methods and Practices | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT816 – CS | Ethical Hacking | (E) | ✓ | ✓ | ✓ | | | ✓ |
| | CSIT824 – CS | Wireless Networks | (E) | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | CSIT825 – CS | System and Security Administration | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT826 – CS | Intrusion Detection and Prevention Systems | (E) | ✓ | ✓ | | ✓ | | ✓ |
| | CSIT834 – CS | Cloud Computing | (E) | ✓ | ✓ | | | ✓ | |

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18. BSIT CURRICULUM SKILLS MAPPING

| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Learning Outcomes | | | | | |
|---|--------------|---|-----------------------------|-----------------------------|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 |
| Data Analytics and Artificial Intelligence Specialization (DA) | CSIT835 – CS | Applied Cyber Security | (E) | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | CSIT844 - CS | Advanced Cryptographic Algorithms | (E) | ✓ | ✓ | | | ✓ | ✓ |
| | CSIT845-CS | TCP/IP and Routing | (E) | ✓ | ✓ | | | ✓ | |
| | CSIT846-CS | Mobile Internet Technology | (E) | ✓ | ✓ | | | | |
| | CSIT736 – DA | Database Management Systems 2 | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT814 – DA | Data Integration | (E) | ✓ | ✓ | | | | ✓ |
| | CSIT815 – DA | Database Administration | (E) | ✓ | ✓ | | | | |
| | CSIT816 – DA | Data Mining and Analysis in Information Technology | (E) | ✓ | | | | ✓ | ✓ |
| | CSIT824 – DA | Web Mining and Information Retrieval | (E) | ✓ | ✓ | ✓ | | | ✓ |
| | CSIT825 – DA | Big Data Analytics in Business Intelligence | (E) | ✓ | ✓ | ✓ | | | ✓ |
| | CSIT826 – DA | Big Data Architecture and Design | (E) | ✓ | ✓ | ✓ | | | ✓ |
| | CSIT835 – DA | Principles of Data Science and Visualization | (E) | ✓ | ✓ | | | | ✓ |
| | CSIT836 – DA | Cloud-based Data Distribution and Virtualization | (E) | ✓ | ✓ | | | ✓ | |
| | CSIT844 – DA | Computational Thinking with Python | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Applications Development Specialization (AD) | CSIT845 – DA | Data Interpretation and Statistical Analysis in Information Technology | (E) | ✓ | ✓ | ✓ | | ✓ | |
| | CSIT846 – DA | Database Driven Web Applications | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT736 – AD | Database Management Systems 2 | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT814 – AD | Python Programming | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT815 – AD | Database Administration | (E) | ✓ | ✓ | | | | |
| | CSIT816 – AD | Agile Project Management | (E) | ✓ | ✓ | | | | ✓ |
| | CSIT824 – AD | C# Programming and Application Development | (E) | ✓ | ✓ | | | | ✓ |
| | CSIT825 – AD | Mobile Application Development | (E) | ✓ | ✓ | ✓ | | | ✓ |
| | CSIT826 – AD | Computer Graphics and Applications | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT835 – AD | Cloud Computing | (E) | ✓ | ✓ | | | ✓ | ✓ |
| | CSIT836 – AD | Server Side Programming | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT844 – AD | Software Quality Assurance | (E) | ✓ | | | ✓ | ✓ | |
| | CSIT845 – AD | .Net Technologies | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | CSIT846 – AD | Software Testing Tools | (E) | ✓ | ✓ | ✓ | | ✓ | |

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY (BSIT)

CURRICULUM PLAN EFFECTIVE AY 2022-2023

COURSES DESCRIPTION**FOUNDATION COURSES**

| COURSE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITE(S) |
|--------|--------------|-----|-----|--------|------------------|
|--------|--------------|-----|-----|--------|------------------|

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BSIT PROGRAMME SPECIFICATIONS 2022-2023

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| CODE | | Hrs | Hrs | UNITS | |
|---|---------------------------|-----|-----|-------|--|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| This course is a foundation in mathematics focus on the building of the knowledge and skills and understanding to solve problems in college algebra and trigonometry. It deals with the topics on equations and Inequalities; functions and graphs; polynomial and rational Functions; exponential and logarithmic functions; trigonometric functions; trigonometric identities and equations; application of trigonometry; systems of equations and inequalities; and matrices. It also includes the application of the mathematical thinking process. | | | | | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| ENGL500 is a required foundation course for entering students whose English language skills need further improvement and enhancement to be able to cope with the university's academic courses. This course introduces the students to the English language where they get involved and engaged in the learning process. It utilizes an integrated approach in developing the students' English macro communication skills in speaking, listening, grammar, and vocabulary in one phase (PR intermediate) which will serve as the benchmark for the next level first year English course. Furthermore, the course intensifies its intended learning objectives with the comprehensive utilization of audio-lingual presentations, includes information related to dictionary use, basic grammar rules, daily use vocabulary words through a variety of contexts, written responses, writing structures, settings of writing, and the process of forming written and spoken communications. Hence, the students are expected to gain more knowledge to communicate effectively in English. | | | | | |

FIRST YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|----------------------------------|---------|---------|--------------|-----------------|
| CSIT611 | Introduction to Computers and IT | 2 | 2 | 3 | |
| This course covers a detailed knowledge and understanding of basic IT infrastructure. Students will gain proficiency in articulating the concept of preventive maintenance, identifying relevant resources, and discussing common challenges associated with computers. Additionally, the curriculum provides an overview of major operating systems, including Windows, Linux, and Mac OS, covering topics such as hardware administration, resource allocation, and data management. Furthermore, it ensures thorough coverage of five domains, with mobile devices, networking, hardware, virtualization and cloud computing, and hardware and network troubleshooting. | | | | | |
| ENGL611 | English Communication Skills 1 | 3 | 0 | 3 | |
| This is an introductory course in English communication designed to provide comprehensive, up-to-date and relevant instruction in the correct use of grammar. It intends to build up students' confidence in communicating their thoughts, ideas, information and messages through the functions and structures of different words, phrases, clauses, sentences and paragraphs. In addition, the integration of language skills increases their communicative competence and prepares them for the academic and social challenges in college and beyond. | | | | | |
| ARAB600 | Arabic Language | 3 | 0 | 3 | |
| The course focuses on the fundamentals of Arabic language, such as reading, analyzing, and critique. It explains the characteristics of the required texts, which deal with different literary genres, prose and poetry. | | | | | |

The course also focuses on the understanding and application of grammatical rules and basic morphological methods in Arabic, considering the correct spelling skills.

| | | | | | |
|---------|------------|---|---|---|--|
| EUTH400 | Euthenics1 | 1 | 0 | 0 | |
|---------|------------|---|---|---|--|

This course is designed to bring in the policies and procedures in the university, to guide the students in the performance of their respective role and to become adept on ideals needed in their academic pursuit. Thus, students are oriented on the history, vision, mission, values and objectives of the university, the services and academic support available, the academic and non-academic policies, the different misconduct and violations with corresponding penalties in which the learning objectives are better facilitated by various classroom discussion through collaborative team work learning experience

| | | | | | |
|---------|-----------------|---|---|---|--|
| MATH611 | College Algebra | 3 | 0 | 3 | |
|---------|-----------------|---|---|---|--|

This course is designed to familiarize learners with the main theories, principles and concepts of college algebra that are useful in analysis and simplification of basic and some advanced mathematical problems. Content includes functions which are polynomial, rational, exponential, logarithmic and related equations. Sketching graphs, Matrices, determinants, progressions and inequalities.

| | | | | | |
|---------|---------------------------|---|---|---|--|
| ECON600 | Introduction to Economics | 3 | 0 | 3 | |
|---------|---------------------------|---|---|---|--|

This course introduces students to the economic analysis of decision-making, how markets work, and how consumers and firms make their decisions. The course focuses on the application of economic reasoning to a range of problems relevant for understanding the mechanisms and institutions that allocate and distribute resources. It covers rational decisions; demand and supply; the market mechanism; elasticity, efficiency, and equity.

| | | | | | |
|---------|--------------|---|---|---|--|
| HUMR600 | Human Rights | 3 | 0 | 3 | |
|---------|--------------|---|---|---|--|

This course makes the students able to know the background, main concepts of Human Rights and the philosophical thoughts and Islamic view which contribute in modern Human Rights. It makes them able to analyze what is mentioned in different kinds of Human Rights sources such as Universal Declaration of Human Rights, International Covenant on Civil and Political Rights and International Covenant on Economic, Social and Cultural Rights. It deals in the same approach with the National Sources of Human Rights such as the Constitutional Law of Kingdom of Bahrain and National Action Charter with applications as well. The course makes the students able to analyze, discuss and debate Human Rights issues in different ways.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|--------------|---------|---------|--------------|----------------|
|-------------|--------------|---------|---------|--------------|----------------|

| | | | | | |
|---------|------------------------|---|---|---|---------|
| CSIT621 | Computer Programming 1 | 2 | 2 | 3 | CSIT611 |
|---------|------------------------|---|---|---|---------|

This course covers detailed knowledge in problem solving and algorithm development, with emphases on developing good programming habits, and programming in a modern computer language. The course familiarizes the students with the features of object-oriented programming and its applications to solve the problems. It includes an overview of the Java language syntax, including packages, classes, methods, variables, conditional statements, control flow and arrays.

The laboratory focuses on the implementation of the programming theories and concepts in Java programming language.

| | | | | | |
|---------|------------------------|---|---|---|---------|
| CSIT622 | Multimedia Development | 2 | 2 | 3 | CSIT611 |
|---------|------------------------|---|---|---|---------|

This course provides detailed information and some advanced necessary skills on multimedia development and delivery. The course familiarizes the students with the components of multimedia, its applications, and underlying techniques of incorporating multiple media, compression and sharing. Students will learn to apply the art of visual communication using multimedia technologies.

The laboratory focuses on training the students to implement the theoretical knowledge that they have

gained in lecture along with their creativity using any multimedia software.

| | | | | | |
|---------|----------------|---|---|---|---------|
| CSIT623 | Digital Design | 2 | 2 | 3 | CSIT611 |
|---------|----------------|---|---|---|---------|

This course explores the foundational concepts of digital logic systems. It covers number systems, coding systems (BCD, ASCII, Gray code), Boolean algebra, logic gates, and combinational and sequential circuits. Students design and analyze encoders, decoders, multiplexers, arithmetic units, flip-flops, latches, counters, and registers. The course emphasizes optimization techniques such as Karnaugh Maps and Boolean identities.

Laboratory sessions use industry-standard simulation tools such as Logisim, Multisim, and Quartus II to implement designs and test circuit behavior. Students also gain exposure to hardware description languages (HDL) through VHDL/Verilog-based mini-projects and analyze timing diagrams, enabling a practical, project-based learning experience..

| | | | | | |
|---------|--------------------------------|---|---|---|---------|
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
|---------|--------------------------------|---|---|---|---------|

This is an intermediate course in English communication geared towards equipping the college students with writing skills in preparation for academic writing. It progresses from familiarizing the sentence conventions to balancing the structures of the sentence for variation and rhythm. Further, it enables students to follow the principles that govern the composition writing in achieving unity, coherence and emphasis; to improve their expository, descriptive, narrative and argumentative works and to get hold of the discipline in academic writing for future advantages by providing them the opportunity in adhering the process of writing for effective communication.

| | | | | | |
|---------|------------|---|---|---|---------|
| EUTH401 | Euthenics2 | 1 | 0 | 0 | EUTH400 |
|---------|------------|---|---|---|---------|

This course is designed to provide discussion on the students' rules and regulations of the university in order to practice the right conduct of behavior inside and outside the university premises. It intends to teach the students on the different stages of personality development, the equivalent penalties in different academic offences and factors that influence behavioral multiple intelligences. Further, the incorporation of oral/written communication through individual and group discussions can encourage learners to ponder on the meaning of life and discover the purpose of their existence.

| | | | | | |
|---------|----------------------|---|---|---|---------|
| MATH622 | Discrete Mathematics | 3 | 0 | 3 | MATH611 |
|---------|----------------------|---|---|---|---------|

This course introduces fundamental concepts and techniques in set theory in preparation for its many applications in computer science. Topics include propositions, predicates, proofs, sets, relations, functions, graphs and trees. It simplifies and evaluates basic logic statements including compound statements, implications, inverses, converses, and contrapositives using truth table and the properties of logic.

| | | | | | |
|---------|-----------------------------------|---|---|---|--|
| HIST600 | History of Bahrain and GCC Region | 3 | 0 | 3 | |
|---------|-----------------------------------|---|---|---|--|

This Course includes the history of the Kingdom of Bahrain and the Arabian Gulf region. It includes the important events in Bahrain and the Arabian Gulf region and their impact on the current situation. It covers the strategic importance of Bahrain, starting with "Ancient civilizations and passing through" the Islamic era, Bahrain's entry into Islam, Portuguese occupation, competition of powers in the 17th century and the rise of a tribe of Al-Atub. It includes the history of Bahrain under the British protection and the conventions between Bahrain and Great Britain up to British troops leaving the region. It describes the places and persons as well as the historical developments and achievement in Bahrain during the time of Al- Khalifah. It includes independence of Bahrain, issuing of the first constitutional law, reform project by His His Majesty King Hamad, constitutional amendments, establishment of GCC, history of Arab Gulf states. It makes the student able to present his patriotic character through historical discussions.

THIRD TRIMESTER

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| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|---|--|---------|---------|--------------|----------------|
| CSIT631 | Computer Programming 2 | 2 | 2 | 3 | CSIT621 |
| <p>This is an introductory course designed to equip students with the foundational skills necessary for computer programming. The lecture classes will cover a broad range of topics essential for beginners, such as understanding tokens, variables, data types, and control structures. In addition to that, students will learn how to manage input and output data and string manipulation, providing a strong theoretical foundation for students.</p> <p>In laboratory sessions, students will apply the theoretical concepts learned in lectures using Python. These sessions aim to solidify students' understanding and enable them to confidently apply their programming skills in practical scenarios.</p> | | | | | |
| CSIT632 | Web Content Management | 1 | 2 | 2 | CSIT611 |
| <p>This course explores the use of the most popular open-source web-based content management systems to create dynamic and flexible websites. Students explore the fundamentals of planning dynamic websites, CMS database management, developing CSS-controlled site templates, and creating database-driven websites through the planning and creation of their own topic-based sites.</p> | | | | | |
| CSIT633 | Introduction to Green Computing | 3 | 0 | 3 | CSIT611 |
| <p>This course empowers students to reduce the energy use, waste, and other environmental impacts of IT systems while reducing life cycle costs, thereby improving competitive advantage. Students learn how to measure computer power usage, minimize power usage, procure sustainable hardware, design green data centers, recycle computer equipment, configure computers to minimize power, use virtualization to reduce the number of servers, and other green technologies. Students also learn how to make green IT an integral part of organizational culture and planning, to foster long term sustainable information technology.</p> | | | | | |
| CSIT634 | Computer Organization and Architecture | 2 | 2 | 3 | CSIT623 |
| <p>This course provides essential knowledge and understanding of computer organization and architecture, including system functions, components, and their interconnections. It covers the theories, principles, and concepts related to memory hierarchy and organization, I/O peripherals and interfacing, instruction sets based on the 8086 microprocessor, addressing modes, and memory access techniques. The course also explores processor structure and functions, including interrupts, and introduces RISC and CISC architectures. Through laboratory sessions and in-course projects, students will creatively implement complex microprocessor-based applications using Assembly language.</p> | | | | | |
| MATH631 | Calculus 1 | 5 | 0 | 5 | MATH611 |
| <p>This course is intended to develop practical skills in differential calculus. Emphasis is placed on conics, functions, limits and continuity, explicit and implicit differentiation of algebraic and transcendental functions, higher-order derivatives, and its applications, related rates, equations of tangent and normal lines, sketching polynomial curves, optimization (maxima and minima).</p> | | | | | |
| ENGL631 | Speech and Oral Communication | 2 | 2 | 3 | ENGL621 |
| <p>This is a developmental course in English communication geared towards competent, efficient and effective interpersonal speaking across communicative contexts. It refines oral communication skills through accurate articulation of segmental phonemes, pronunciation drills and enunciation of the suprasegmental features of speech, specifically sentential stress and intonation. Further, it incorporates the mechanics and techniques of speech craft and delivery with emphases on practical speaking experiences and analysis of audience psychology, which are deemed applicable in diverse speech situations.</p> | | | | | |

SECOND YEAR

FIRST TRIMESTER

| COURSE CODE | COURS ETITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--|---|---------|---------|--------------|----------------|
| CSIT711 | Web Design Techniques and Tools | 2 | 2 | 3 | CSIT632 |
| <p>This course provides an overview of modern web technologies and tools used for designing and developing interactive web applications. The course focuses on HTML, CSS, and JavaScript as core technologies for structuring, styling, and adding interactivity to web pages. Students will explore the principles of responsive design, client-side scripting, and best practices for creating user-friendly and accessible websites. Through practical lab sessions, students will develop complete web pages and simple web applications that function across major browsers.</p> | | | | | |
| CSIT712 | Data Structures | 2 | 2 | 3 | CSIT621 |
| <p>This course covers advanced problem solving in linear and non-linear data structures and their implementation. Topics include arrays, sorting and searching techniques, stacks, queues, linked lists, trees and hash tables. In addition, it covers various strategies for choosing appropriate structures according to the system requirements.</p> <p>The laboratory portion covers the implementation of linear data structures such as stacks and queues and nonlinear data structure like trees and graphs using array and linked list.</p> | | | | | |
| CSIT713 | Data Communications and Networking 1 | 2 | 2 | 3 | CSIT634 |
| <p>This course integrates the core theories, principles, concepts, structure, functions and components of the Internet and computer networks. The OSI and TCP/IP models are used to examine the services and the associated protocols in each layer. The concepts and structure of IPv4 addressing and subnetting, its application, operation and implementation to networks are discussed. The laboratory part makes use of a range of approaches including the Packet Tracer and GNS3 to allow students to implement static routing and critically analyze network requirements, issues and/or problems. These simulators will allow the students to build networks, use appropriate devices and IP addresses, and perform configurations.</p> | | | | | |
| CSIT714 | Professional Ethics in IT | 2 | 0 | 2 | CSIT611 |
| <p>This course provides exploration and analysis of a broad range of topics regarding the ethical implications of widespread use of computer technology. Topics include socio-technical computer ethics, ethics and information technology, ethics in IT configured societies, information flow privacy and surveillance, digital intellectual property, and professional ethics in computing.</p> | | | | | |
| CSIT715 | Introduction to Management Information System | 3 | 0 | 3 | CSIT611 |
| <p>The course integrates with the current Information Systems concepts and technologies. Students will learn how information systems could be used effectively at different levels of management for the purpose of decision-making process. The course will cover concepts on how information system give a business or organization a competitive edge by providing technologies that help managers plan, organize, control, and lead. Includes topics such as information systems components, decision support system, e-business concepts and implementation, enterprise resource planning and common information systems used today.</p> | | | | | |
| MATH621 | Probability and Statistics | 3 | 0 | 3 | MATH631 |
| <p>This course provides a demonstration of the main concepts of probability and statistics with applications. IT also covers identifying the theorem of probability and linked with real life problems. How to differentiate between the combination and permutation, Explain how to find the mean and variance from the moment generating function. Explain and interpret the findings from different hypothesis tests for decision making. Finally, SPSS will be used to run the statistical measures (e.g. hypothesis tests and regression model)</p> | | | | | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--|--------------------------------------|---------|---------|--------------|----------------|
| ENGL711 | Technical Writing | 3 | 0 | 3 | ENGL621 |
| This is an advanced course in English academic writing designed to deal with the application of the technical writing principles with the correspondence on business, science, and technology. It aims to develop the technical writing skills and communication of the college students thru the discussions of its elements and ethics with the use of digital technologies. Furthermore, it enables students to adapt the various communication routes in the workplace, to conceptualize suitable contents of technical writing, to understand the characteristics and other methods of communication techniques, to plan and organize advanced level tasks and to work effectively and with accountability with other team members in a creative and productive manner, in any language learning scenario when achieving personal and group outcomes. | | | | | |
| CSIT721 | Database Management Systems 1 | 2 | 2 | 3 | CSIT712 |
| This course provides advanced core theories and practical skills in databases and database management systems with information technology applications. The theoretical knowledge covers Database Environment, Relational Model, Database Operations, Structured Query Language, Entity Relationship Model and Normalization. It exposes the student to the advanced concepts and techniques in database development as well provides a foundation for research in databases. The laboratory practices the Data Definition Language (DDL) Commands, Data Manipulation Language (DML) Commands, Data Query Language(DQL) Commands, Transaction Control Language(TCL) Commands, SQL Built-in Functions, Constraints, Joins, GroupBy Command, Subqueries and Database Objects using Oracle SQL Developer tool. | | | | | |
| CSIT722 | Operating Systems | 2 | 2 | 3 | CSIT712 |
| This course provides advanced and in-depth knowledge of the components and functionalities of operating systems. Topics include operating system structures, process management and scheduling, memory management, virtual memory, deadlocks, file systems, directory structures, protection, security, distributed operating systems, virtualization, and real-time operating systems (RTOS). Students will explore both foundational principles and modern advancements in operating system design, preparing them to work with contemporary and emerging technologies in the field. In the laboratory component, various operating system commands are demonstrated using Windows and Linux platforms. Algorithms related to scheduling, memory management, and page replacement are implemented using the Java/Python programming language. | | | | | |
| CSIT723 | Data Communications and Networking 2 | 2 | 2 | 3 | CSIT713 |
| This course provides an in-depth and advanced discussion of routing technology. It integrates the core theories, concepts, functions and operations of a router including the principles and applications of routing protocols. Topics include router components and configuration; Unicast and Multicast routing protocols: RIPv1, RIPv2, EIGRP, OSPF and BGP; VLSM and IPv6. The students make use of a range of approaches including the Packet Tracer, GNS3 and the actual network devices in the laboratory in performing advanced and complex network configurations using the different routing protocols and in the critical analysis of network requirements, issues and/or problems. | | | | | |
| CSIT724 | System Administration | 2 | 2 | 3 | CSIT634 |
| This course provides critical knowledge and experience for IT professionals. Students will have the knowledge required to assemble components based on customer requirements. Install, configure and maintain devices. PCs and software for end users understand the basics of networking and security/forensics properly and safely diagnose, resolve and document common hardware and software issues while applying | | | | | |

troubleshooting skills Student will also provide appropriate customer support; understand the basics of virtualization, desktop Imaging and deployment.

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|---|-------------------|---|---|---|---------|
| CSIT725 | Technopreneurship | 3 | 0 | 3 | CSIT715 |
| This course is discusses the rapid evolving world on creative new venture in internet marketing. The road to entrepreneurial success is long, winding and strewn with pitfalls, obstacles and blind turns. This course intends to give an understanding of technopreneurship fundamentals. The topics covered include in information age, developing business plan, financing and marketing business, innovation and creativity, financial management, and products identification. Students will be exposed to various case studies on successful entrepreneurs. | | | | | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|---|---|---------|---------|--------------|----------------|
| CSIT731 | Blockchain Technology and Application | 3 | 0 | 3 | CSIT713 |
| This course introduces blockchain technology and its role as a transformative innovation in the digital era. Students will explore what blockchain is, how it works, and why it is considered revolutionary. Key concepts include mining, hashing, proof-of-work, public key cryptography, and the double-spend problem. The course also examines the seven core design principles of blockchain, along with the challenges faced in its development and implementation. In addition, learners will gain insights into the blockchain ecosystem, its key stakeholders, and reflect on their potential role in contributing to the blockchain revolution. | | | | | |
| CSIT732 | System Analysis and Design | 2 | 2 | 3 | CSIT721 |
| The course describes the concepts and methods used in the analysis and design of computer-based information systems. It includes the discussion of typical computer systems life cycles, system requirements and specification, feasibility concerns, system design, fault tolerance, people and interface issues, compliance with ethical and legal standards and quality issues. The laboratory focuses on training the students with hands-on experience Microsoft Visio, drawing DFD, preparing SRS document | | | | | |
| CSIT733 | IT Project Management | 2 | 2 | 3 | CSIT715 |
| This course focuses on the advanced management and development of software project management techniques and methods. It covers project definition, project scheduling, team management, software measurement and estimation techniques, risk analysis, project management tools and software process models, process measurement, software project planning, cost estimation and scheduling, project management tools, factors influencing productivity and success. Furthermore, it covers the software process standards and process implementation, software contracts and intellectual property and approaches to maintenance and long-term software development. In the laboratory focuses on training the students with hands-on experience on project management tools | | | | | |
| CSIT734 | Cyber Security for Information Technology | 3 | 0 | 3 | CSIT713 |
| This course is designed to provide concepts and practices cyber security with sufficient coverage of essential topics required for entry-level cyber security certifications. An effective cyber security defense consists of four distinct challenges: securing the infrastructure, securing devices, securing local networks, and securing the perimeter. Overcoming these challenges requires a detailed understanding of the concepts and practices within each realm. This course covers each challenge individually for greater depth of information, with real-world scenarios that show what vulnerabilities look like in everyday computing scenarios. | | | | | |
| CSIT735 | Cryptographic Algorithms | 3 | 0 | 3 | CSIT713 |
| This course provides a comprehensive introduction to cryptography and data security. Topics covered include | | | | | |

symmetric and asymmetric encryption techniques, cryptographic algorithms such as DES and AES, stream ciphers, block ciphers, and public-key cryptography. Practical aspects of implementing these algorithms in software and hardware are explored through laboratory activities. Students will gain hands-on experience in encrypting and decrypting messages using various cryptographic methods. The course emphasizes both theoretical understanding and practical application, preparing students to analyze cryptographic systems and implement secure data transmission solutions. This structured approach ensures that students not only understand the foundational principles of cryptography but also gain proficiency in applying these principles to real-world scenarios. The course culminates in a final examination that assesses both theoretical knowledge and practical skills developed throughout the semester.

THIRD YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--|-------------------------------------|---------|---------|--------------|----------------|
| CSIT811 | Software Design and Development | 2 | 2 | 3 | CSIT732 |
| This course demonstrates the concepts in software design paradigms; identify software requirements and of latest trends in designing and developing efficient software applications. The course covers an in-depth survey of software process models, analysis and design methods, reliability, maintenance and metrics. The laboratory focuses on providing students with hands-on experience using different tools to design a mini project. | | | | | |
| CSIT812 | Human Computer Interaction | 3 | 0 | 3 | CSIT732 |
| The course provides techniques used to analyze and design Human-Computer Interaction (HCI) systems. Topics include usability principles, user-centered design, usability testing, accessibility, interaction design, visual design, and the impact of emerging technologies on HCI. | | | | | |
| CSIT813 | Information Security and Governance | 2 | 2 | 3 | CSIT714 |
| This course provides a foundational understanding of the core principles of information security, focusing on Confidentiality, Integrity, and Availability (CIA) triad. Students will engage with key concepts such as risk management, information governance, security policies, and access control mechanisms. Through a combination of hands-on activities, collaborative problem-solving, and theoretical lectures, the course emphasizes practical application and critical thinking in tackling information security challenges | | | | | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--|--------------------|---------|---------|--------------|----------------|
| CSIT821 | System Integration | 3 | 0 | 3 | CSIT811 |
| This course focuses on the information systems in organizations, the process by which different computing systems and software applications are linked together physically or functionally. It examines the strategies and methods for blending a set of interdependent systems into a functioning or unified whole, thereby enabling two or more applications to interact and exchange data seamlessly. The course will explore tools and techniques for systems integration as well as proven management practices for integration projects. | | | | | |
| CSIT822 | Embedded System | 3 | 0 | 3 | CSIT634 |
| This course provides critical knowledge and understanding of real time embedded systems design, development and implementation. It includes embedded system types, microcontroller architecture, programming, digital and analog I/O interfacing, parallel interfacing, interrupt and timers management, and communication interfaces. Through laboratory and in- course project, the students will creatively implement | | | | | |

complex applications of real time embedded systems.

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|---|--------------------|---|---|---|---------|
| CSIT823 | Mobile Programming | 2 | 2 | 3 | CSIT812 |
| <p>This course provides a systematic explanation of advanced concepts in mobile programming and provides an in depth coverage of mobile systems and it application development. It includes the mobile user interface, application development standards and mobile technology. Moreover, it covers various mobile computing applications using common paradigms in mobile application frameworks and development environments.</p> <p>The Lab component of the course includes developing apps based on UI widgets, custom views and layouts, notification, toast, menus, dialog, list and data storage using flutter.</p> | | | | | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--|--------------------|---------|---------|--------------|----------------|
| CSIT831 | Practicum in IT | 0 | 12 | 6 | CSIT821 |
| <p>This course provides the students with an opportunity to be immersed in the actual work environment along their specialization. The students are required to complete 240 hours on-site training to get hands on experience of working in the industry.</p> | | | | | |
| CSIT832 | Research Project A | 3 | 0 | 3 | CSIT823 |
| <p>This course provides guidelines that will enable the students to effectively prepare a research project in relation to their field of specialization. It deals with the development of the essential ideas, concepts, principles, tools, and skills needed for developing a research project. All stages of project development should be emphasized including problem identification, literature review, planning, design and on completion, the student must submit a final written report outlining the various phases of the project and make an oral presentation.</p> | | | | | |

FOURTH YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|---|--------------------|---------|---------|--------------|----------------|
| CSIT841 | Internet of Things | 3 | 0 | 3 | CSIT723 |
| <p>This course discusses the current and leading IoT technologies for building IoT solutions for Smart Homes, Smart Campus etc., using IoT sensors, actuators and devices. It covers key concepts of IoT (Internet of Things) and challenges related to digital transformation, security and privacy. The course examines the evolution of the Internet and how the interconnection of people, processes, data, and things are transforming every industry.</p> | | | | | |
| CSIT842 | Research Project B | 3 | 0 | 3 | CSIT832 |
| <p>This course provides opportunity to students to integrate their knowledge by implementing a significant software system as part of a systems development project including proper documentation in a real-world environment.</p> | | | | | |

ELECTIVE COURSES

Elective 1 - Software Expertise

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|--------------|---------|---------|--------------|----------------|
|-------------|--------------|---------|---------|--------------|----------------|

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| | | | | | |
|---|------------------------------------|---|---|---|---------|
| CSIT833- A | Parallel and Distributed Computing | 2 | 2 | 3 | CSIT821 |
| This course provides an overview of distributed and parallel systems, with special emphasis on cloud-based implementations. Topics include distributed systems and models, computer clusters for scalable parallel computing, virtual machines, cloud platform architecture, service-oriented architecture, grid computing, and peer-to-peer computing. The Laboratory exercises will be used to demonstrate various aspects of parallel and distributed computing in NetBeans with various simulation tools like VMware, Hadoop, CloudSIM and IBM's Bluemix. | | | | | |
| CSIT833 - B | Enterprise Resource Planning | 2 | 2 | 3 | CSIT821 |
| This course serves as an introduction to Enterprise Resource Planning and also provides a solid foundation for many disciplines in common business modern information systems. Students examine how and why an ERP system is implemented and how it is integrated with existing business processes. Students examine the impact of ERP on the organization and how change can be managed. The laboratory focuses on training the students with hands-on experience using SAP. | | | | | |
| CSIT833 - C | Compiler Construction | 2 | 2 | 3 | CSIT821 |
| This course introduces the fundamental principles of compiler design, covering the theory, implementation, and optimization of programming language translators. Students will explore lexical analysis, syntax analysis, semantic analysis, intermediate code generation, code optimization, and target code generation. The course includes hands-on implementation of compiler components and the use of tools such as Lex and Yacc for building parsers. By the end of the course, students will have developed a working compiler for a simple programming language. | | | | | |

Elective – 2 Intelligent Systems

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--|--|---------|---------|--------------|----------------|
| CSIT843 – A | Artificial Intelligence and Machine Learning | 2 | 2 | 3 | MATH621 |
| This course covers advanced theories and state-of-the-art techniques of artificial intelligence. Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on computers. The AI is to make a computer that can learn, plan, and solve problems autonomously. The topic includes building blocks and components of artificial intelligence, learning about concepts like algorithms, machine learning, and neural networks. The laboratory focuses on training the students with building models using various artificial intelligence algorithms | | | | | |
| CSIT843 - B | Expert Systems | 2 | 2 | 3 | MATH621 |
| This course introduces the principles, design, and application of expert systems. It covers knowledge representation, inference mechanisms, reasoning under uncertainty, rule-based systems, and practical tools for developing expert systems. Students will gain both theoretical understanding and hands-on experience in building prototype expert systems for real-world applications. | | | | | |
| CSIT843 - C | Principles of Data Science | 2 | 2 | 3 | MATH621 |
| This course utilizes several open-source tools to address big data challenges, taking an "Open" or technology-neutral approach. It covers concepts, and techniques needed to deal with various aspects of data science practice, including data collection, cleansing, mangling, and integration, exploratory data analysis, predictive modeling, descriptive modeling, data product creation, machine learning algorithms, evaluation, effective communication and data visualization. | | | | | |

SPECIALIZATION ELECTIVES



Networking and Cyber Security Specialization (CS)

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|---|---|---------|---------|--------------|----------------|
| CSIT736 – CS | <i>Introduction to Digital Forensics</i> | 3 | 0 | 3 | CSIT722 |
| This course offers a comprehensive introduction to the field of digital forensics, essential for investigating and solving cybercrimes. It covers the fundamental concepts, methodologies, and technologies used to collect, analyze, and present digital evidence. Students will explore topics such as cybercrime, forensic examination techniques, data acquisition, and evidence analysis from computers and mobile devices. Practical skills are developed through hands-on laboratory exercises involving forensic tools like FTK Imager and EnCase Forensics Imager. | | | | | |
| CSIT814 – CS | <i>Network Security</i> | 2 | 2 | 3 | CSIT723 |
| This course covers the fundamentals of security in the networked environment. It includes coverage of risks and vulnerabilities, controls and protection methods, encryption and authentication technologies. | | | | | |
| CSIT815 – CS | <i>Security Methods and Practices</i> | 3 | 0 | 3 | CSIT724 |
| This course introduces the principles and practices of system and network security, with emphasis on securing mobile, wireless, and internet-based environments. Students will explore security models, cryptography, intrusion detection and prevention, and secure application development. Key topics include internet, intranet, LAN, wireless, cellular, and IoT security. The course also covers privacy, security management systems, and policy-driven approaches for IT managers. By the end, students will gain both theoretical understanding and practical awareness of threats, defenses, and emerging technologies in mobile and network security. | | | | | |
| CSIT816 – CS | <i>Ethical Hacking</i> | 2 | 2 | 3 | CSIT736CS |
| This course provides a comprehensive introduction to the field of cyber security and ethical hacking. It covers essential concepts, methodologies, and tools used in the industry to safeguard digital systems and networks from malicious attacks. Students will gain both theoretical knowledge and practical skills, enabling them to identify, analyze, and mitigate various security threats. Through interactive lectures, hands-on lab sessions, and collaborative projects, the course emphasizes active and engaged learning, problem-solving, and the application of industry standards and best practices | | | | | |
| CSIT824 – CS | <i>Wireless Networks</i> | 2 | 2 | 3 | CSIT723 |
| This course provides engineering, computer science, and cybersecurity students with the theoretical knowledge and practical skills needed to design, secure, and defend modern wireless networks. Students will explore wireless communication fundamentals with a strong emphasis on security threats, encryption protocols, intrusion detection systems, and secure network design. Through hands-on labs, penetration testing exercises, and real-world case studies, students will learn to identify vulnerabilities, implement defense mechanisms, and conduct wireless security audits. The course also covers emerging technologies such as Wi-Fi 6/7, IoT wireless systems, and AI-driven security monitoring, preparing students for both academic advancement and industry-recognized certifications. | | | | | |
| CSIT825 – CS | <i>System and Security Administration</i> | 2 | 2 | 3 | CSIT724 |
| This course provides an in-depth understanding of system security concepts, administration techniques, and security policies. It covers fundamental security principles, system hardening, network security, access controls, cryptographic techniques, and incident response. Students will gain hands-on experience in security administration, vulnerability assessment, and system monitoring through lab exercises. | | | | | |
| CSIT826 – CS | <i>Intrusion Detection and Prevention Systems</i> | 2 | 2 | 3 | CSIT736CS |
| This course will deal with methods that ID systems use to detect attacks against Information Networks. These | | | | | |



methods will include auditing systems, monitoring techniques, and various Intrusion Detection Processes and technologies that can be used for discovery of Hackers and Attacks that could threaten the Confidentiality, Integrity, or Availability of an Information System. The two basic types of Intrusion Detection: Anomaly and Misuse detection will be discussed.

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|--------------|------------------------|---|---|---|-----------|
| CSIT834 – CS | <i>Cloud Computing</i> | 3 | 0 | 3 | CSIT826CS |
|--------------|------------------------|---|---|---|-----------|

This course covers advanced concepts required to build a cloud infrastructure based on a cloud computing reference model. The reference model includes five fundamental layers, namely, physical, virtual, control, and service and three cross-layer functions, namely business continuity, security, and service management for building a Cloud infrastructure. Furthermore, Topics included Cloud infrastructure reference model, resource management, programming models, application models, system characterizations, and implementations, deployment of Cloud computing systems. Moreover, this course takes an open approach to describe concepts and technologies.

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|--------------|-------------------------------|---|---|---|---------|
| CSIT835 – CS | <i>Applied Cyber Security</i> | 3 | 0 | 3 | CSIT734 |
|--------------|-------------------------------|---|---|---|---------|

This course blends advanced technical skills with real-world cybersecurity scenarios. Students will apply their knowledge from prior courses to tackle critical domains such as malware analysis, secure software development, forensic response, threat modeling, and modern cryptographic applications. Legal and ethical dimensions of cybersecurity are also explored through case studies and debates.

Each week focuses on a specific area of cybersecurity, with a hands-on project that reinforces key skills. By the end of the course, students will be equipped to analyze security architectures, detect and respond to threats, and communicate findings through professional reports. The course concludes with a full-scope practical project simulating a real- world security challenge

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|--------------|--|---|---|---|---------|
| CSIT844 – CS | <i>Advanced Cryptographic Algorithms</i> | 2 | 2 | 3 | CSIT735 |
|--------------|--|---|---|---|---------|

This course covers advanced topics in cryptography and data security. Students will explore symmetric and asymmetric encryption techniques, digital signatures, hash functions, and key establishment protocols. Practical laboratory sessions provide hands-on experience in implementing various cryptographic algorithms and protocols. The course emphasizes both theoretical understanding and practical application, preparing students to analyze, design, and implement secure communication systems. By the end of the course, students will be equipped with the knowledge and skills necessary to address contemporary challenges in data security and cryptography.

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|--------------|---------------------------|---|---|---|---------|
| CSIT845 – CS | <i>TCP/IP and Routing</i> | 2 | 2 | 3 | CSIT723 |
|--------------|---------------------------|---|---|---|---------|

This course provides an in-depth study of TCP/IP routing protocols and their application in modern network infrastructures. Students will explore various aspects of TCP/IP, including its structure, addressing, and protocols. The curriculum covers practical and theoretical knowledge essential for designing, implementing, and troubleshooting TCP/IP networks. Through lectures, lab sessions, and case studies, students will gain proficiency in cryptographic experiments, evaluating cryptographic algorithms, and implementing secure data transmission solutions. The course also delves into advanced cryptographic concepts and their practical implications.

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|--------------|-----------------------------------|---|---|---|-----------|
| CSIT846 – CS | <i>Mobile Internet Technology</i> | 3 | 0 | 3 | CSIT824CS |
|--------------|-----------------------------------|---|---|---|-----------|

This course examines the characteristics of mobile and wireless networks and the impact of these technologies on the development of software and supporting protocols. Topics covered include mobile and wireless application design and development environments, middleware support, protocol requirements for ad-hoc and sensor networks, wireless & mobile security vulnerabilities and standards, supporting reliable communication in lossy and intermittently connected networks; challenges and architectures for wireless mobility - 4G networks, Wi-Fi, Wi-Max, Bluetooth, Mobile IP, convergence of voice and data networks.

Data Analytics and Artificial Intelligence Specialization (DA)

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--|---|---------|---------|--------------|----------------|
| CSIT736 – DA | <i>Database Management Systems 2</i> | 2 | 2 | 3 | CSIT721 |
| This course focuses on the practical implementation of computerized database systems using SQL and GUI module. Key topics include SQL database programming, writing scripts to query and manipulate databases, designing and implementing stored procedures, views, and cursors, as well as creating user-friendly GUI forms and reports. | | | | | |
| CSIT814 – DA | <i>Data Integration</i> | 2 | 2 | 3 | CSIT721 |
| This course covers the impact data integration has on data analytics and how that impact is managed across the spectrum of data management and data analytics. Learners research technologies common to the IT industry that are used to integrate data from multiple resources. Learners gain an understanding of those data integration tools and techniques and apply them to data analysis. The laboratory focuses on training the students with hands-on experience on several open-source software tools. | | | | | |
| CSIT815 – DA | <i>Database Administration</i> | 2 | 2 | 3 | CSIT721 |
| This course focuses on the roles and responsibilities of database administrators and explores how they contribute to data management. Learners determine how database design, administration, regulations, and standards impact effective data management processes. Learners also explore the tools and strategies that allow a database administrator to support data management. Topics include Oracle Database Architecture, Database Installation, Creating Database Using DBCA, Database Instances, ASM Instances, Network Environment, Storage Structures, User Security, Concurrency Control Mechanisms, Database Auditing and Maintenance, Performance Management, Backup and Recovery Concepts, Moving Data, Database Restart. Whole content will be explained in Oracle environment | | | | | |
| CSIT816 – DA | <i>Data Mining and Analysis in Information Technology</i> | 2 | 2 | 3 | CSIT721 |
| This course provides an in-depth study of the field of statistical analysis and data mining as it relates to real-world applications. The course explores how the advanced and complex data mining interdisciplinary field brings together techniques from databases, statistics, machine learning, and information retrieval. It covers the field of data mining and includes the topics data preprocessing, predictive modeling, model evaluation techniques, clustering, classification, and association analysis and anomaly detection. The Laboratory session discusses R data mining tool and using that perform preprocessing, classifications and clustering based on real word data sets | | | | | |
| CSIT824 – DA | <i>Web mining and Information Retrieval</i> | 2 | 2 | 3 | CSIT816DA |
| This course provides an in-depth exploration of the techniques and technologies used in web mining and information retrieval. Students will learn to extract useful information from the web, including structured, semi-structured, and unstructured data. The course covers key topics such as web crawling, web scraping, natural language processing, sentiment analysis, and the use of machine learning algorithms for classification, clustering, and recommendation systems. Additionally, students will gain hands-on experience with state-of-the-art tools and frameworks | | | | | |
| CSIT825 – DA | <i>Big Data Analytics in Business Intelligence</i> | 2 | 2 | 3 | CSIT816DA |

This course provides fundamental concepts related to big data and analytics. This course will explore the theory and applications of big data and demonstrate the process from data to decisions. Students will learn big data in various formats, data processing platforms and data analytics tools to transform, visualize, model, and communicate the insights hidden in the data, providing end-users with timely knowledge to support decision making. The course will explain the challenges the organizations are facing with managing big data

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|--------------|---|---|---|---|-----------|
| CSIT826 – DA | <i>Big Data Architecture and Design</i> | 2 | 2 | 3 | CSIT816DA |
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This course provides an overview of approaches facilitating data analytics on huge datasets. Different strategies are presented including sampling to make classical analytics tools amenable for big datasets, analytics tools that can be applied in the batch or the speed layer of a lambda architecture, stream analytics, and commercial attempts to make big data manageable in massively distributed or in-memory databases. Learners will be able to realistically assess the application of big data analytics technologies for different usage scenarios and start with their own experiments.

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|--------------|---|---|---|---|---------|
| CSIT834 – DA | <i>Cloud Based Data Distribution and Virtualization</i> | 3 | 0 | 3 | CSIT731 |
|--------------|---|---|---|---|---------|

This course covers advanced concepts required to build a cloud infrastructure based on a cloud computing reference model. The reference model includes five fundamental layers, namely, physical, virtual, control, and service and three cross-layer functions, namely business continuity, security, and service management for building a Cloud infrastructure. Furthermore, Topics included Cloud infrastructure reference model, resource management, programming models, application models, system characterizations, and implementations, deployment of Cloud computing systems. Moreover, this course takes an open approach to describe concepts and technologies.

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|--------------|---|---|---|---|-----------|
| CSIT835 – DA | <i>Principles of Data Science and Visualization</i> | 2 | 2 | 3 | CSIT825DA |
|--------------|---|---|---|---|-----------|

This course utilizes several open-source tools to address big data challenges, taking an “Open” or technology-neutral approach. It covers concepts, and techniques needed to deal with various aspects of data science practice, including data collection, cleansing, mangling, and integration, exploratory data analysis, predictive modeling, descriptive modeling, data product creation, machine learning algorithms, evaluation, effective communication and Data Visualization systems. Moreover, this course takes an open approach to describe concepts and technologies.

| | | | | | |
|--------------|---|---|---|---|-----------|
| CSIT844 – DA | <i>Computational Thinking with Python</i> | 2 | 2 | 3 | CSIT736DA |
|--------------|---|---|---|---|-----------|

This course aims to explore and enable learners to master the skills of advanced topics in Python Programming. It helps learners develop advanced skills such as working with databases, matching patterns, implementing threads and exception handling and GUI in Python. It also highlights why Python is a useful scripting language for all developers

| | | | | | |
|--------------|---|---|---|---|-----------|
| CSIT845 – DA | <i>Data Interpretation and Statistical Analysis in Information Technology</i> | 3 | 0 | 3 | CSIT816DA |
|--------------|---|---|---|---|-----------|

This course is designed to introduce basic principles of statistical methods and procedures used for data analysis. It also covers the crucial topics in statistics and advanced topics in Data mining including mining association rules, cluster analysis, stream data mining, time series data mining, sequence pattern mining, text mining and web mining.

| | | | | | |
|--------------|---|---|---|---|-----------|
| CSIT846 – DA | <i>Database Driven Web Applications</i> | 2 | 2 | 3 | CSIT736DA |
|--------------|---|---|---|---|-----------|

This course provides the knowledge necessary to design and develop dynamic, database-driven Web pages. This course introduces the PHP framework and syntax and covers in depth the most important techniques used to build dynamic Web sites. Students learn how to connect to any modern database, and perform hands on practice with a MySQL database to create database-driven HTML forms and reports.

Applications Development Specialization (AD)

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|--|---|----------------|----------------|---------------------|-----------------------|
| CSIT736 – AD | <i>Database Management Systems 2</i> | 2 | 2 | 3 | CSIT721 |
| This course focuses on the practical implementation of computerized database systems using SQL and GUI module. Key topics include SQL database programming, writing scripts to query and manipulate databases, designing and implementing stored procedures, views, and cursors, as well as creating user-friendly GUI forms and reports. | | | | | |
| CSIT814 – AD | <i>Python Programming</i> | 2 | 2 | 3 | CSIT736AD |
| This course aims to explore and enable learners to master the skills of advanced topics in Python Programming. It helps learners develop advanced skills such as working with databases, matching patterns, implementing threads and exception handling and GUI in Python. It also highlights why Python is a useful scripting language for all developers. | | | | | |
| CSIT815 – AD | <i>Database Administration</i> | 2 | 2 | 3 | CSIT721 |
| This course focuses on the roles and responsibilities of database administrators and explores how they contribute to data management. Learners determine how database design, administration, regulations, and standards impact effective data management processes. Learners also explore the tools and strategies that allow a database administrator to support data management. Topics include Oracle Database Architecture, Database Installation, Creating Database Using DBCA, Database Instances, ASM Instances, Network Environment, Storage Structures, User Security, Concurrency Control Mechanisms, Database Auditing and Maintenance, Performance Management, Backup and Recovery Concepts, Moving Data, Database Restart. Whole content will be explained in Oracle environment | | | | | |
| CSIT816 – AD | <i>Agile Project Management</i> | 3 | 0 | 3 | CSIT733 |
| This course focuses on the core components of Agile project management, examining how it is distinct from traditional project management and equipping course participants with strategies and techniques for successful Agile project implementation. Students will practice the role of a project manager facilitating Agile practices towards achieving desired outcomes, as well as take a more in-depth look at the fundamental Agile concepts of adaptive planning, customer collaboration, and value-driven delivery in dynamic and often highly constrained environments | | | | | |
| CSIT824 – AD | <i>C# Programming and Application development</i> | 2 | 2 | 3 | CSIT736AD |
| This course introduces programming using the C# language within the .NET framework. Students will learn the fundamentals of C# syntax, data types, control structures, object-oriented programming, and exception handling. The course also covers the development of simple applications, including console-based and graphical user interface (GUI) programs. By the end of the course, students will be able to design, write, and debug C# programs to solve real-world problems . | | | | | |
| CSIT825 – AD | <i>Mobile Application Development</i> | 2 | 2 | 3 | CSIT823 |
| This course provides students with hands-on experience in developing mobile applications through a structured, project-based learning approach. Building upon the foundation of mastering technical documentation and independent learning, students will engage in planning, designing, and developing | | | | | |

functional mobile applications. The course emphasizes critical thinking, collaboration, and creativity while reinforcing self-reliance and problem-solving skills. Students will explore real-world use cases, apply modern development practices, and present their projects through structured phases, ensuring they gain both technical and professional competencies relevant to the rapidly evolving mobile application industry.

| | | | | | |
|--------------|---|---|---|----------|---------|
| CSIT826 – AD | <i>Computer Graphics and Applications</i> | 2 | 2 | 3 | CSIT722 |
|--------------|---|---|---|----------|---------|

This course explores advanced technologies and algorithms used in the generation and display of computer graphics. Topics include geometric primitives, their attributes and implementation, 2D and 3D transformations, viewing techniques, and computer animation. The laboratory component provides hands-on experience using graphics tools to apply, visualize, and implement the concepts, theories, and models introduced in lectures.

| | | | | | |
|--------------|------------------------|---|---|----------|---------|
| CSIT834 – AD | <i>Cloud Computing</i> | 3 | 0 | 3 | CSIT731 |
|--------------|------------------------|---|---|----------|---------|

This course covers advanced concepts required to build a cloud infrastructure based on a cloud computing reference model. The reference model includes five fundamental layers, namely, physical, virtual, control, and service and three cross-layer functions, namely business continuity, security, and service management for building a Cloud infrastructure. Furthermore, Topics included Cloud infrastructure reference model, resource management, programming models, application models, system characterizations, and implementations, deployment of Cloud computing systems. Moreover, this course takes an open approach to describe concepts and technologies.

| | | | | | |
|--------------|--------------------------------|---|---|----------|-----------|
| CSIT835 – AD | <i>Server Side Programming</i> | 2 | 2 | 3 | CSIT736AD |
|--------------|--------------------------------|---|---|----------|-----------|

This course provides the knowledge necessary to design and develop dynamic, database-driven Web pages. This course introduces the PHP framework and syntax and covers in depth the most important techniques used to build dynamic Web sites. Students learn how to connect to any modern database and perform hands on practice with a MySQL database to create database-driven HTML forms and reports.

| | | | | | |
|--------------|-----------------------------------|---|---|----------|---------|
| CSIT844 – AD | <i>Software Quality Assurance</i> | 3 | 0 | 3 | CSIT811 |
|--------------|-----------------------------------|---|---|----------|---------|

This course provides a comprehensive introduction to Software Quality Assurance (SQA) and Testing. Students will learn about the fundamental principles and practices of testing, the various levels and types of tests, and the role of testing within the Software Development Life Cycle (SDLC). The course covers both manual and automated testing techniques, emphasizing practical skills and real-world applications.

| | | | | | |
|--------------|--------------------------|---|---|----------|---------|
| CSIT845 – AD | <i>.Net Technologies</i> | 2 | 2 | 3 | CSIT812 |
|--------------|--------------------------|---|---|----------|---------|

This course discusses advanced skills needed for software development using Visual Programming tools. It includes programs with graphical interfaces, Visual Basic Controls and Dialog Boxes, Decision Structures, Loops, Classes and Objects, Arrays and Collections and Exceptional Handling and Debugging. Moreover, it covers event-driven programming and interaction with databases. The course also provides brief introduction to ASP.Net

The laboratory focuses on training the students with hands-on experience on Visual Studio.Net. The students will gain skills on Visual programming using the Integrated Development Environment (IDE) Visual Studio

| | | | | | |
|--------------|-------------------------------|---|---|----------|---------|
| CSIT846 – AD | <i>Software Testing Tools</i> | 2 | 2 | 3 | CSIT811 |
|--------------|-------------------------------|---|---|----------|---------|

This course discusses advanced concepts of software quality and techniques in software quality assurance, particularly software testing and validation. It presents the in-depth interplay between testing, quality assurance and quality engineering to ensure the quality of the software. This course covers software quality

| | | |
|--|---------------------|-----------|
|  University of Technology Bahrain | Doc. No. | QR-AAD-01 |
| | Revision No. | 01 |
| | Date of Effectivity | 01-09-23 |
| College: College of Computer Studies | | |
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and assurance framework, testing concepts and issues, verification and validation, inspection, software reliability, quality models and measurement and formal methods.



College of Engineering (COE)





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| | |
|---|--|
| 1. Teaching Institution | University of Technology Bahrain (UTB) |
| 2. University Department | College of Engineering (COE) |
| 3. Programme Title | Bachelor of Science in Environmental Engineering (BSEnE) |
| 4. Title of Final Award | Bachelor of Science in Environmental Engineering (BSEnE) |
| 5. Delivery Mode | Actual classroom learning-interactive (Full-time) |
| 6. Attendance Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | NQF Level 8 612 NQF Credits (204 ACS Credits) |
| 8. Accreditation | None |
| 9. Other external influences | Local External Influences/References <ul style="list-style-type: none">- Ministry of Education (MOE)- Higher Education Council (HEC)- Education and Training Quality Authority (BQA) International External Influences/References <ul style="list-style-type: none">- Accreditation Board for Engineering and Technology (ABET)- American Association of Environmental Engineers (AAEE) |
| 10. Date of production/revision of this specification | September 2022 |
| 11. Aims of the Programme | |
| <p>The Bachelor of Science in Environmental Engineering (BSEnE) Program at UTB is the field of engineering that aims to produce competent, ethical, and socially responsible engineers capable of addressing current and emerging environmental challenges. Graduates will be equipped with a strong foundation in engineering principles, environmental sciences, and sustainability, enabling them to design and implement effective, safe, and economically viable environmental systems and technologies.</p> <p>Programme Educational Objectives</p> <p>The objectives of BSEnE programme are to produce graduates who will be able to:</p> <ol style="list-style-type: none">1. Pursue careers in Environmental Engineering or related fields towards the improvement of engineering practice.2. Engage in lifelong learning towards completion of advanced/continuing education/industrial training or other learning opportunities.3. Demonstrate professional success via promotions and/or positions of increasing responsibility. | |
| 12. Programme Intended Learning Outcomes | |
| Upon successful completion of the programme, the student will be able to: | |





1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. Communicate effectively with a range of audiences
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. Acquire and apply new knowledge as needed, using appropriate learning strategies

Teaching and Learning Methods

1. Constructive Method. Learners must be fully engaged and active in the process of constructing meaning and knowledge based on their prior knowledge and experiences through the process of doing, making, writing, designing, creating and solving. It allows teachers to implement differentiated learning, authentic assessment practices and incorporate technologies to improve individual learning experiences. It includes simulations, in-course projects, field trips, digital content, group discussions and reflections. This method strives to improve achievement by consciously developing learners' ability to consider ideas, analyze perspectives, solve problems and make decisions on their own thereby making them more responsible and independent.
2. Inquiry based Method. Learners develop cognitive skills like critical thinking and problem solving by working on questions, problems, or scenarios and formulate creative solutions. The teachers use structured, guided or open inquiry to facilitate learning. As a process, learners are involved in their learning by formulating questions, investigating, building their understanding and creating meaning and new knowledge on a certain lesson. Typically activities include laboratory sessions and research-based activities.
3. Collaborative Method. Learners are divided into small groups to learn something together and capitalize on one's other resources and skills, evaluating one another ideas, and monitoring one another's work. It allows students to actively interact by sharing experiences and take on different roles. Typically, students are provided with problems or projects that they work on together to search for understanding, meaning, or solutions and each group is expected to work together developing or formulating solutions and present the solution in class. The activities include think-pair-share, jigsaw, or round-robin which effectively engage students to complete the tasks.
4. Experiential learning method is the process of learning by doing. By engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. This may include team challenges, simulations, company visits/fieldworks and other extracurricular activities. Experiential learning opportunities exist in a variety of course- and non-course-



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based forms and may include community service, service-learning, undergraduate research, study abroad, and culminating experiences such as internships, student teaching, and capstone projects.

Assessment Methods

Assessment is done independently for each course. A variety of assessment tools will be used to assess achievement of intended learning outcomes including but not limited to: combination of written examinations (essays, class tests, homework, case analysis), assessed coursework (problem sets, laboratory exercises and machine problems), presentations and design projects.

13. Programme Structure**BACHELOR OF SCIENCE IN ENVIRONMENTAL ENGINEERING (BSEnE)**

CURRICULUM PLAN EFFECTIVE AY 2022-2023

FOUNDATION COURSES

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|-------------|---------------------------|---------|---------|--------------|---------------|
| ENGL500 | English Foundation Course | 12 | 0 | 0 | - |
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | - |

FIRST YEAR**FIRST TRIMESTER**

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|--------------------|--------------------------------|---------|---------|--------------|---------------|
| MATH611 | College Algebra | 3 | 0 | 3 | - |
| ENGG601 | Engineering Drawing | 2 | 2 | 3 | - |
| CHEM611 | General Chemistry | 2 | 2 | 3 | - |
| ENGL611 | English Communication Skills 1 | 3 | 0 | 3 | - |
| CSCI611A | Introduction to Computing | 2 | 2 | 3 | - |
| SOCI600 | Sociology | 3 | 0 | 3 | - |
| EUTH400 | Euthenics 1 | 1 | 0 | 0 | - |
| Total Units | | | | 18 | |

SECOND TRIMESTER

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|-------------|----------------------------------|---------|---------|--------------|---------------|
| MATH612 | Plane and Spherical Trigonometry | 3 | 0 | 3 | - |
| SCIE611 | Biology | 2 | 2 | 3 | - |

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| | | | | | |
|--------------------|--------------------------------|---|---|-----------|----------|
| CHEM621 | Inorganic Chemistry | 2 | 2 | 3 | CHEM611 |
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
| ARAB600 | Arabic Language | 3 | 0 | 3 | - |
| CENG621 | Computer Programming 1 | 2 | 2 | 3 | CSCI611A |
| EUTH501 | Euthenics 2 | 1 | 0 | 0 | EUTH400 |
| Total Units | | | | 18 | |

THIRD TRIMESTER

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|--------------------|--|---------|---------|--------------|--------------------|
| MATH632 | Differential Calculus with Analytic Geometry | 5 | 0 | 5 | MATH611 MATH612 |
| ENGL631 | Speech and Oral Communication | 2 | 2 | 3 | ENGL621 |
| CHEM631 | Organic Chemistry | 3 | 2 | 4 | CHEM621 |
| ENVE611 | Elementary Surveying | 2 | 2 | 3 | MATH612 |
| HIST600 | History of Bahrain and GCC Region | 3 | 0 | 3 | - |
| Total Units | | | | 18 | |

SECOND YEAR

FIRST TRIMESTER

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|--------------------|---|---------|---------|--------------|---------------|
| HUMR600 | Human Rights | 3 | 0 | 3 | SOCI600 |
| CHEM711 | Analytical Chemistry | 3 | 2 | 4 | CHEM631 |
| MATH712 | Integral Calculus with Differential Equations | 5 | 0 | 5 | MATH632 |
| ENGL711 | Technical Writing | 3 | 0 | 3 | ENGL621 |
| PHYS631 | University Physics 1 | 2 | 2 | 3 | MATH632 |
| Total Units | | | | 18 | |

SECOND TRIMESTER

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|-------------|----------------------------|---------|---------|--------------|---------------|
| MATH621 | Probability and Statistics | 3 | 0 | 3 | MATH611 |
| ENGG724 | Thermodynamics | 3 | 0 | 3 | PHYS631 |
| CHEM722 | Environmental Biochemistry | 2 | 2 | 3 | SCIE611 |

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| | | | | | |
|--------------------|---|---|---|-----------|---------|
| ENGG722 | Engineering Economy | 3 | 0 | 3 | MATH611 |
| PHYS711 | University Physics 2 | 2 | 2 | 3 | PHYS631 |
| ENVE721 | Fundamentals of Environmental Engineering | 3 | 0 | 3 | SCIE611 |
| Total Units | | | | 18 | |

THIRD TRIMESTER

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|--------------------|---------------------------------|---------|---------|--------------|---------------|
| MATH733 | Linear Algebra | 2 | 2 | 3 | MATH712 |
| CHEM723 | Physical Chemistry | 2 | 2 | 3 | CHEM711 |
| ENGG723 | Safety Engineering | 2 | 0 | 2 | - |
| ENVE722 | Unit Operation: Fluid Mechanics | 2 | 2 | 3 | ENGG724 |
| SCIE723 | Environmental Microbiology | 2 | 2 | 3 | SCIE611 |
| ENGG725 | Engineering Mechanics | 3 | 0 | 3 | PHYS711 |
| Total Units | | | | 17 | |

THIRD YEAR**FIRST TRIMESTER**

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|--------------------|------------------------------------|---------|---------|--------------|---------------|
| CHEM811 | Water Chemistry | 2 | 2 | 3 | CHEM722 |
| MATH722 | Advanced Mathematics | 2 | 2 | 3 | MATH712 |
| ENGG814 | Engineering Materials | 3 | 0 | 3 | CHEM611 |
| ENVE811 | Unit Operation: Heat Transfer | 2 | 2 | 3 | ENGG724 |
| ENGG852 | Professional Ethics in Engineering | 1 | 0 | 1 | - |
| CHEM812 | Atmospheric Chemistry | 3 | 0 | 3 | CHEM631 |
| Total Units | | | | 16 | |

SECOND TRIMESTER

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|-------------|-------------------------------|---------|---------|--------------|---------------|
| ENVE821 | Water Resources Engineering | 3 | 0 | 3 | CHEM811 |
| ENVE822 | Instrumentation and Control | 2 | 2 | 3 | CHEM711 |
| ENVE823 | Unit Operation: Mass Transfer | 2 | 2 | 3 | ENVE811 |



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| | | | | | |
|--------------------|--|---|---|-----------|---------|
| MATH732 | Numerical Methods and Analysis | 2 | 2 | 3 | MATH722 |
| ENVE824 | Air Pollution and Prevention | 3 | 0 | 3 | ENVE721 |
| ENVE825 | ENVE Unit Operation: Physical and Chemical Treatment | 2 | 2 | 3 | ENVE722 |
| Total Units | | | | 18 | |

THIRD TRIMESTER

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|--------------------|--|---------|---------|--------------|---------------|
| ENVE831 | Air Quality Engineering | 3 | 0 | 3 | ENVE824 |
| ENVE832 | Soil Engineering | 3 | 0 | 3 | ENVE821 |
| ENVE833 | Environmental Engineering Laws and Regulations | 3 | 0 | 3 | ENVE722 |
| ENVE834 | Environmental Quality Systems Engineering | 3 | 0 | 3 | ENVE721 |
| ENVE835 | ENVE Unit Operation: Biological Treatment | 2 | 2 | 3 | SCIE723 |
| ENVE836 | Technopreneurship | 3 | 0 | 3 | ENGG722 |
| Total Units | | | | 18 | |

FOURTH YEAR

FIRST TRIMESTER

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|--------------------|---|---------|---------|--------------|----------------|
| ENVE837 | Methods of Research with Inferential Statistics | 3 | 0 | 3 | MATH621 |
| ENVE838 | Project and Engineering Management | 3 | 0 | 3 | ENGG722 |
| ENVE839 | Engineering Hydrology | 3 | 0 | 3 | ENVE821 |
| ENVE840 | Oil and Gas Technology 1 | 3 | 0 | 3 | ENVE821 |
| See List Below | Elective 1 | 2 | 2 | 3 | See List Below |
| See List Below | Elective 2 | 2 | 2 | 3 | See List Below |
| Total Units | | | | 18 | |

SECOND TRIMESTER



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| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|--------------------|--|---------|---------|--------------|-------------------------------|
| See List Below | Elective 3 | 2 | 2 | 3 | See List Below |
| ENVE841 | Environmental Planning and Design | 3 | 0 | 3 | ENVE834 |
| ENVE842 | Industrial Attachment | 0 | 12 | 6 | 4 th year standing |
| ENVE843 | Environmental Engineering Project Design A | 3 | 0 | 3 | ENVE838 |
| Total Units | | | | 15 | |

THIRD TRIMESTER

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|--------------------|--|---------|---------|-------------------------|---------------|
| ENVE844 | Wastewater Engineering | 3 | 0 | 3 | ENVE835 |
| ENVE845 | Oil and Gas Technology 2 | 3 | 0 | 3 | ENVE840 |
| ENVE846 | Environmental Impact Assessment | 3 | 0 | 3 | ENVE834 |
| ENVE847 | Environmental Engineering Project Design B | 3 | 0 | 3 | ENVE834 |
| Total Units | | | | 12 | |
| Grand Total | | | | 204 Credit Units | |

TECHNICAL ELECTIVES (*Students Must choose 3 courses from the list below*)

| Course Code | Course Title | Lec Hrs | Lab Hrs | Credit Units | Prerequisites |
|-------------|--|---------|---------|--------------|---------------|
| ENVE848 | Renewable Energy | 2 | 2 | 3 | ENVE834 |
| ENVE849 | Climate and Global Warming | 2 | 2 | 3 | ENVE834 |
| ENVE850 | Remote Sensing | 2 | 2 | 3 | ENVE834 |
| ENVE851 | Hazardous Waste Management and Remediation | 2 | 2 | 3 | ENVE835 |
| ENVE852 | Introduction to GIS | 2 | 2 | 3 | ENVE836 |
| ENVE853 | Advanced Topics in Environmental Engineering | 2 | 2 | 3 | ENVE837 |

14. Awards and Credits



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| | |
|-------------------------------|--|
| Degree/ Certificate Awarded | Bachelor of Science in Environmental Engineering |
| Total Units for Degree | 204 |
| Total Trimesters Completed | 12 |
| 15. Admission Criteria | |

F. For First Year Undergraduate Applicants

Acceptance to the University depends on the following admissions requirements:

17. Completely filled out an admission application form.
18. Minimum secondary school scores 60% or its equivalent.
19. Online Placement test (Oxford Online Placement Test (OOPT)) Result (if needed)
20. Submission of all required documents stated in the Admissions Policy.

To be admitted to any undergraduate programme, the applicant must satisfy the minimum secondary school grades or its equivalent without the need to take the remediation classes of English and Math, as shown in the following table:

| <i>Subtest Component for Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification</i> | | <i>Engineering Studies</i> |
|--|----------------------------------|-----------------------------------|
| Mathematics | Science/ Technical/General Track | At least 70% or C |
| | Commercial Track | At least 80% or B |
| | Literature and Islamic Tracks | At least 80% or B |
| Science | | 60 |
| English | | At least 80 or B |

| <i>Subtest Component for Other Qualification (Indian, Pakistan, and West African)</i> | | <i>Engineering Studies</i> |
|--|---------------------------------|-----------------------------------|
| Mathematics | Science/Technical/General Track | At least 51 or C1 |
| | Commercial Track | At least 71 or B1 |
| | Literature and Islamic Tracks | At least 71 or B1 |
| Science | | 60 |
| English | | At least 71 or B1 |

For the undergraduate applicant who did not meet the minimum required secondary school grades in Mathematics, Science and English or its equivalent, his/her admissions depend on the following criteria:





| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|---|--|----------------------------------|---|
| All Programmes | 60-79 % grade in English | Score \geq 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| Engineering, Computer Science, Business Informatics | For Commercial Track: Score 50-79% in Math For Scientific, General, and technical Track: Score 50-69% in Math | NA | Foundation Course in Math |
| | For Science score <60% | NA | Tutorial class in general sciences |
| All Programmes | CGPA < 60% for Bahraini and KSA CGPA < 41% for Indian and Pakistan | NA | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

a. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

b. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program (English Foundation).

c. IELTS/TOEFL

Applicants who submit official IELTS or TOEFL certificates issued by accredited examination centers, with a minimum score of 450 on the TOEFL (paper-based), 131 on the TOEFL (computer-based), or 5.0 on the IELTS, are exempted from taking the required English Placement Test.

In addition, applicants who obtain an IELTS score of 5.5 or higher or a TOEFL score that meets the equivalent standard may qualify for English course exemptions based on their results. This policy recognizes academic achievement by allowing eligible students to be exempted from enrolling in introductory English courses upon admission.

| IELTS/TOEFL Scores | Exemption |
|--------------------|-----------|
|--------------------|-----------|



Qualified applicants with 5.5 IELTS scores or
TOEFL: 496 (paper-based) or 169 (computer based)

Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 (English Communication Skills 1)

Qualified applicants with 6.0 IELTS scores or
TOEFL: 546 (paper-based) or 211 (computer based)

Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 and ENGL402/ENGL621 (English Communication Skills 1 and 2)

d. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature and Islamic tracks must take the remediation course in Math.

e. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

B. For Undergraduate Transfer Student Applicants

Application Requirements:

31. Completely filled out an admission application form
32. Official Transcript of Records (TOR) from the university previously attended. Rules and regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school certificates are to be applied when necessary.
33. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
34. Certificate of Transfer from the university previously attended stamped by MOE, if any.
35. Withdrawal Certificate stamped by MOE
36. Submission of all required documents stated in the admissions policy.

Admissions Requirements:

16. For Bahrain and KSA qualifications, the applicant should have at least a secondary school average of 60%. For non-Bahrain secondary qualifications (Indian and Pakistan) the applicant

should have at least 41% secondary school average; and for other non-Bahraini qualifications please refer to the table of cut-off.

17. If the applicant has taken and passed courses in English and Mathematics in the previous university, the applicant will be exempted in taking the remedial courses in both English and Mathematics. The applicant may proceed to mainstream university courses and is eligible to apply for credit transfer.
18. If the applicant has not taken any course in English and Mathematics, the basis for evaluation whether remedial course in English and mathematics is required or not is the subject scores in his/her last year in the secondary school certificate using the table presented earlier.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. Practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or re-admitted student from UTB.

The University requires the undergraduate student to complete at least 50% of the required credit units/hours of a programme in residence at UTB. The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit units/hours based on his/her original degree from another university.

16. CGPA Requirement for Graduation

The required CGPA for an undergraduate student to be eligible for graduation is 2.0 out of 4.0.

17. Career Pathways

The BSEnE graduates can pursue a career as test field engineer, risk assessment officer, environmental policy analyst, environmental impact assessor, Environmental engineer, pollution control officer, environmental consultant, environmental health and safety engineer, environmental compliance officer, wastewater engineer, water quality control engineer, recycling products engineer, hazardous waste test engineer, air quality inspector, biotech remediation project scientist, industrial waste management specialist, and environmental project engineer. In addition, the programme can lead graduates for postgraduate degrees in related engineering fields.

| 18. | BSEnE CURRICULUM SKILLS MAPPING | | | | | | | | | |
|-------------------|---------------------------------|---------------------|-----------------------------------|---|-----|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Intended Learning Outcomes / Student Outcomes | | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| Year 1 1st Tri | MATH611 | College Algebra | (C) | ✓ | | | | | | |
| | ENGG601 | Engineering Drawing | (C) | ✓ | | | | | ✓ | |

College/Department: College of Engineering

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| 18. BSEnE CURRICULUM SKILLS MAPPING | | | | | | | | | | |
|-------------------------------------|-------------|--|-----------------------------------|---|-----|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Intended Learning Outcomes / Student Outcomes | | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| | CHEM611 | General Chemistry 1 | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| | ENGL611 | English Communication Skills 1 | (C) | | | ✓ | | | | |
| | CENG611A | Introduction to Computing | (C) | ✓ | | | | | ✓ | |
| | SOCI600 | Sociology | (C) | | | | ✓ | | | |
| Year 1 2nd Tri | MATH612 | Plane and Spherical Trigonometry | (C) | ✓ | | | | | | |
| | SCIE611 | Biology | (C) | ✓ | | | | ✓ | ✓ | |
| | CHEM621 | Inorganic Chemistry | (C) | ✓ | | ✓ | | ✓ | ✓ | ✓ |
| | ENGL621 | English Communication Skills 2 | (C) | | | ✓ | | | | |
| | ARAB600 | Arabic Language | (C) | | | | ✓ | | | |
| | CENG621 | Computer Programming 1 | (C) | ✓ | | | | | ✓ | |
| Year 1 3rd Tri | MATH632 | Differential Calculus with Analytic Geometry | (C) | ✓ | | | | | | |
| | ENGL631 | Speech and Oral Communication | (C) | | | ✓ | | | | |
| | CHEM631 | Organic Chemistry | (C) | ✓ | | | | | ✓ | ✓ |
| | ENVE611 | Elementary Surveying | (C) | ✓ | | ✓ | | ✓ | ✓ | |
| | HIST600 | History of Bahrain and GCC Region | (C) | | | | ✓ | | | |
| Year 2 1st Tri | HUMR600 | Human Rights | (C) | | | | ✓ | | | |
| | CHEM711 | Analytical Chemistry | (C) | ✓ | | | | ✓ | ✓ | ✓ |

College/Department: College of Engineering

BSEnE PROGRAMME SPECIFICATIONS AY2022-2023

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| 18. BSEnE CURRICULUM SKILLS MAPPING | | | | | | | | | | |
|-------------------------------------|-------------|---|-----------------------------------|---|-----|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Intended Learning Outcomes / Student Outcomes | | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| | MATH712 | Integral Calculus with Differential Equations | (C) | ✓ | | | | | | |
| | ENGL711 | Technical Writing | (C) | | | ✓ | | | | |
| | PHYS631 | University Physics 1 | (C) | ✓ | | | | | ✓ | |
| Year 2 2nd Tri | MATH621 | Probability and Statistics | (C) | ✓ | | | | | | |
| | ENGG724 | Thermodynamics | (C) | ✓ | | | | | | ✓ |
| | CHEM722 | Environmental Biochemistry | (C) | ✓ | | | | | | |
| | ENGG722 | Engineering Economy | (C) | ✓ | | | ✓ | | | |
| | PHYS711 | University Physics 2 | (C) | ✓ | | | | | ✓ | |
| | ENVE721 | Fundamentals of Environmental Engineering | (C) | ✓ | ✓ | | | | | |
| Year 2 3rd Tri | MATH733 | Linear Algebra | (C) | ✓ | | ✓ | | ✓ | ✓ | |
| | CHEM723 | Physical Chemistry | (C) | ✓ | ✓ | | | | | |
| | ENGG723 | Safety Engineering | (C) | | | | ✓ | | | |
| | ENVE722 | Unit Operation: Fluid Mechanics | (C) | ✓ | | ✓ | | | ✓ | ✓ |
| | SCIE723 | Environmental Microbiology | (C) | ✓ | | | | | | |
| | ENGG724 | Engineering Mechanics | (C) | ✓ | | | | | | |
| Year 3 1st Tri | CHEM811 | Water Chemistry | (C) | ✓ | ✓ | | | | ✓ | ✓ |
| | MATH722 | Advanced Mathematics | (C) | ✓ | | | | | ✓ | ✓ |
| | ENGG814 | Engineering Materials | (C) | ✓ | | | ✓ | ✓ | | |
| | ENVE811 | Unit Operation: Heat Transfer | (C) | ✓ | ✓ | | | | | ✓ |
| | ENGG852 | Professional Ethics and Engineering Laws | (C) | | | | ✓ | | | |

| 18. BSEnE CURRICULUM SKILLS MAPPING | | | | | | | | | | |
|-------------------------------------|-------------|--|-----------------------------------|---|-----|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Intended Learning Outcomes / Student Outcomes | | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| | CHEM812 | Atmospheric Chemistry | (C) | ✓ | ✓ | | | | | ✓ |
| Year 3 2nd Tri | ENVE821 | Water Resources Engineering | (C) | ✓ | ✓ | | | | | ✓ |
| | ENVE822 | Instrumentation and Control | (C) | ✓ | | | | | ✓ | ✓ |
| | ENVE823 | Unit Operation: Mass Transfer | (C) | ✓ | ✓ | | | | ✓ | ✓ |
| | MATH732 | Numerical Methods and Analysis | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| | ENVE824 | Air Pollution and Prevention | (C) | ✓ | ✓ | | | | | ✓ |
| | ENVE825 | ENVE Unit Operation: Physical and Chemical Treatment | (C) | ✓ | | | | | ✓ | ✓ |
| Year 3 3rd Tri | ENVE831 | Air Quality Engineering | (C) | ✓ | ✓ | | ✓ | | | ✓ |
| | ENVE832 | Soil Engineering | (C) | ✓ | ✓ | | | | | ✓ |
| | ENVE833 | Environmental Engineering Laws and Regulations | (C) | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| | ENVE834 | Environmental Quality Systems Engineering | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | ENVE835 | Unit Operation: Biological Treatment | (C) | ✓ | ✓ | | | ✓ | ✓ | |
| | ENVE836 | Technopreneurship | (C) | | | ✓ | ✓ | | | ✓ |
| Year 4 1 st Tri | ENVE837 | Methods of Research with Inferential Statistics | (C) | | ✓ | ✓ | | | | ✓ |
| | ENVE838 | Project and Engineering Management (Risk Analysis) | (C) | ✓ | | | ✓ | | ✓ | |

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BSEnE PROGRAMME SPECIFICATIONS AY2022-2023

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| 18. BSEnE CURRICULUM SKILLS MAPPING | | | | | | | | | | |
|-------------------------------------|-------------|--|-----------------------------------|---|-----|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Intended Learning Outcomes / Student Outcomes | | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| Year 2 nd Tri | ENVE839 | Engineering Hydrology | (C) | ✓ | ✓ | ✓ | | ✓ | | |
| | ENVE840 | Oil and Gas Technology 1 | (C) | ✓ | | | | | | ✓ |
| | ENVE848 | Renewable Energy | (E) | ✓ | | | | | | |
| | ENVE 849 | Climate and Global Warming | (E) | ✓ | | | | | | |
| | ENVE850 | Remote Sensing | (E) | ✓ | | | | | | |
| | ENVE851 | Hazardous Waste Management and Remediation | (E) | ✓ | | | | | | |
| | ENVE852 | Introduction to GIS | (E) | ✓ | | | | | | |
| | ENVE853 | Advanced Topics In Environmental Engineering | (E) | ✓ | | | | | | |
| | ENVE841 | Environmental Planning and Design | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | ENVE842 | Industrial Attachment | (C) | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| | ENVE843 | Environmental Engineering Project Design A | (C) | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| Year 4 3 rd Tri | ENVE844 | Wastewater Engineering | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | ENVE845 | Oil and Gas Technology 2 | (C) | | | | | | | ✓ |
| | ENVE846 | Environmental Impact Assessment | (C) | | | ✓ | ✓ | | | ✓ |
| | ENVE847 | Environmental Engineering Project Design B | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

| | | |
|--|---------------------|-----------------|
|  University of Technology Bahrain | Doc. No. | QR-AAD-01 |
| | Revision No. | 01 |
| | Date of Effectivity | 01-09-23 |
| College/Department: College of Engineering | | |
| BSEnE PROGRAMME SPECIFICATIONS AY2022-2023 | | Page: 222 of 49 |

BACHELOR OF SCIENCE IN ENVIRONMENTAL ENGINEERING (BSEnE)
CURRICULUM PLAN EFFECTIVE AY 2022-2023

COURSES DESCRIPTION

FOUNDATION COURSES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|---|---------------------------|---------|---------|--------------|------------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| This course is a foundation in mathematics focus on the building of the knowledge and skills and understanding to solve problems in college algebra and trigonometry. It deals with the topics on equations and Inequalities; functions and graphs; polynomial and rational Functions; exponential and logarithmic functions; trigonometric functions; trigonometric identities and equations; application of trigonometry; systems of equations and inequalities; and matrices. It also includes the application of the mathematical thinking process. | | | | | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| ENGL500 is a required foundation course for entering students whose English language skills need further improvement and enhancement to be able to cope with the university's academic courses. This course introduces the students to the English language where they get involved and engaged in the learning process. It utilizes an integrated approach in developing the students' English macro communication skills in speaking, listening, grammar, and vocabulary in one phase (PR intermediate) which will serve as the benchmark for the next level first year English course. Furthermore, the course intensifies its intended learning objectives with the comprehensive utilization of audio-lingual presentations, includes information related to dictionary use, basic grammar rules, daily use vocabulary words through a variety of contexts, written responses, writing structures, settings of writing, and the process of forming written and spoken communications. Hence, the students are expected to gain more knowledge to communicate effectively in English. | | | | | |

FIRST YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC HRS | LAB HRS | CREDIT UNITS | PRE-REQUISITES |
|---|---------------------|---------|---------|--------------|----------------|
| MATH611 | College Algebra | 3 | 0 | 3 | - |
| This course is designed to familiarize learners with the main theories, principles, and concepts of college algebra that are useful in the analysis and simplification of basic and some advanced mathematical problems. Content includes functions that are polynomial, rational, exponential, logarithmic and related equations. Sketching graphs, Matrices, determinants, progressions and inequalities as applied to engineering. | | | | | |
| ENGG601 | Engineering Drawing | 2 | 2 | 3 | - |
| This course deals with core theories, principles, and concepts of the topics of This course deals with the application of Computer-Aided Drafting Design (CADD) in sketching and drawing to produce engineering drawings. The student will learn the appropriate AutoCAD drawing and modifying commands to generate 2D | | | | | |



drawings and orthogonal projections of 3D drawings. The course will cover editing, modifying and plotting 2D and 3D drawings.

CHEM611

General Chemistry 1

2

2

3

-

This course demonstrates atomic theories, relationships between structure and properties of matter, scientific notation, density calculation, atomic structure and energy levels, periodic table, ions formation and chemical bonding, chemical reactions and emphasizing the chemical change, balancing equation, Discussion on gas law includes properties and application of gas laws, Acids and bases, solution and clarification of acid – base concept.

ENGL611

English Communication Skills 1

3

0

3

-

This is an introductory course in English communication designed to provide comprehensive, up-to-date and relevant instruction in the correct use of grammar. It intends to build up students' confidence in communicating their thoughts, ideas, information and messages through the functions and structures of different words, phrases, clauses, sentences and paragraphs. In addition, the integration of language skills increases their communicative competence and prepares them for the academic and social challenges in college and beyond.

CSCI611A

Introduction to Computing

2

2

3

-

This course covers the detailed knowledge and understanding of computer hardware and software. It includes the discussion of number systems, networking and internet and the interdisciplinary science of computing. It also provides a discussion of programme development structures and algorithm and flowchart development.

The laboratory focuses on configuring web browser security, configuring E-mail security, configuring OS security and working with Microsoft Excel and Visio.

SOCI600

Sociology

3

0

3

-

This course is designed to expose students in a detailed approach of studying society. It intends to give emphasis on the sociological perspectives, relationships with other social sciences, and the main figures in sociological development, including an introduction to culture, the transformation of societies, the importance of socialization, social groups, deviance and social control. Further, it incorporates the discussions on social institutions that enable the college students to understand the economic perspective from ancient to present, the evolution of education and the current viewpoint of family.

EUTH400

Euthenics 1

1

0

0

-

This course is designed to bring in the policies and procedures in the university, to guide the students in the performance of their respective role and to become adept on ideals needed in their academic pursuit. Thus, students are oriented on the history, vision, mission, values and objectives of the university, the services and academic support available, the academic and non-academic policies, the different misconduct and violations with corresponding penalties in which the learning objectives are better facilitated by various classroom discussion through collaborative teamwork learning experience.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC HRS | LAB HRS | CREDIT UNITS | PRE-REQUISITES |
|--|----------------------------------|---------|---------|--------------|----------------|
| MATH612 | Plane and Spherical Trigonometry | 3 | 0 | 3 | - |
| This course is designed to familiarize learners with main theories, principles and concepts of plane and spherical trigonometry that are useful in analysis and simplification of some advanced mathematical problems. The course covers topics on angles and their measurements, trigonometric/circular functions, inverse trigonometric functions, identities, graphs of trigonometric functions, solutions of trigonometric equations, solutions of right and oblique plane triangles, introduction to spherical trigonometry and its applications | | | | | |
| SCIE611 | Biology | 2 | 2 | 3 | - |
| This course focuses on the detailed knowledge and understanding of the fundamental life processes and functions of living systems including the nature of knowledge relating to cell structure, function and metabolism, bioenergetics, genetics and biotechnology, cellular reproduction and cell division, evolution, biodiversity, and ecology. The students will demonstrate the importance between explanations based on evidence through inquiry-based laboratory activities to provide insight into scientific method. | | | | | |
| CHEM621 | Inorganic Chemistry | 2 | 2 | 3 | CHEM611 |
| This course discusses the inorganic principles, structures, electron distribution and physical and chemical properties of inorganic compounds. The course also provides guidelines for identification of inorganic elements in the periodic table, their occurrence, chemical reactions and impact on the environment. It also discusses the industrial applications and remediation techniques of the removal harmful inorganic elements from the environment. | | | | | |
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
| This is an intermediate course in English communication geared towards equipping the college students with writing skills in preparation for academic writing. It progresses from familiarizing the sentence conventions to balancing the structures of the sentence for variation and rhythm. Further, it enables students to follow the principles that govern the composition writing in achieving unity, coherence and emphasis; to improve their expository, descriptive, narrative and argumentative works and to get hold of the discipline in academic writing for future advantages by providing them the opportunity in adhering the process of writing for effective communication. | | | | | |
| ARAB600 | Arabic Language | 3 | 0 | 3 | - |
| يركز مقرر ARAB600 على دراسة أساسيات اللغة العربية كقراءة وتحليل و نقد وبيان خصائص النصوص المطلوبة التي تتناول مختلف الأجناس الأدبية نثراً وشعراً. كما يركز هذا المقرر على دراسة وفهم وتطبيق القواعد النحوية والأساليب الصرفية الأساسية في اللغة العربية مع مراعاة مهارات الكتابة الإملائية الصحيحة. | | | | | |
| The course focuses on the fundamentals of Arabic language, such as reading, analyzing, and critique. It explains the characteristics of the required texts, which deal with different literary genres, prose and poetry. The course also focuses on the understanding and application of grammatical rules and basic morphological | | | | | |

methods in Arabic, taking into account the correct spelling skills

CENG621

Computer Programming 1

2

2

3

CSCI611A

This course covers detailed knowledge in problem solving and algorithm development, with emphases on developing good programming habits, and programming in a modern computer language. The course familiarizes the students with the features of object oriented programming and its applications to solve the problems. It includes a discussion of an overview of the Java language syntax, including packages, classes, methods, variables, conditional statements, and control flow.

The laboratory focuses on the implementation of the programming theories and concepts in Java programming language using the tool Java Eclipse.

EUTH401

Euthenics 2

1

0

0

EUTH400

This course is designed to provide the discussion on the students' rules and regulations of the university in order to practice the right conduct of behavior inside and outside the university premises. It intends to teach the students on the different stages of personality development, the equivalent penalties in different academic offences and factors that influence behavioral multiple intelligences. Further, the incorporation of oral/written communication through individual and group discussions can encourage learners to ponder on the meaning of life and discover the purpose of their existence.

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|--|---------|---------|--------------|------------------|
| MATH632 | Differential Calculus with Analytic Geometry | 5 | 0 | 5 | MATH611/ MATH612 |
| This course is intended to develop practical skills in differential calculus and analytic geometry. Emphasis is placed on functions, limits and continuity, fundamental concepts of analytic geometry, explicit and implicit differentiation of algebraic and transcendental functions, conics, higher derivatives, polar coordinates and its applications (equations of tangent and normal lines, sketching polynomial curves, maxima and minima problems and time rates | | | | | |
| ENGL631 | Speech and Oral Communication | 2 | 2 | 3 | ENGL621 |
| This is a developmental course in English communication geared towards competent, efficient and effective interpersonal speaking across communicative contexts. It refines oral communication skills through accurate articulation of segmental phonemes, pronunciation drills and enunciation of the suprasegmental features of speech, specifically sentential stress and intonation. Further, it incorporates the mechanics and techniques of speech craft and delivery with emphases on practical speaking experiences and analysis of audience psychology, which are deemed applicable in diverse speech situations.. | | | | | |
| CHEM631 | Organic Chemistry | 3 | 2 | 4 | CHEM621 |
| This course covers the chemistry of unsaturated hydrocarbons, emphasizing the structures and reactions of alkanes, alkenes, alkynes, alkyl halides, alcohols, ethers, carboxylic acids, esters, aldehydes, ketones, and amines, along with their roles and behavior in biological systems. The course also introduces students to heterocyclic compounds, carbohydrates, lipids and fatty acids, and amino acids. Additional topics include the nomenclature of organic compounds, as well as fundamental techniques in organic synthesis and reactions. | | | | | |

| | | | | | |
|--|---------------------------------------|---|---|---|---------|
| ENVE611 | Elementary Surveying | 2 | 2 | 3 | MATH612 |
| <p>This course provides an introduction to the principles and practices of plane surveying, particularly as applied in the construction industry. Students will gain foundational knowledge in land measurement techniques, field procedures, and the use of standard and advanced surveying instruments. Key topics include linear measurements, surveying mathematics, map scaling, basic error theory, traverse surveying, and leveling operations. Emphasis is placed on recording, adjusting, and calculating directions, distances, and elevations with accuracy and precision.</p> | | | | | |
| HIST600 | History of Bahrain and the GCC Region | 3 | 0 | 3 | - |
| <p>يتناول المقرر HIST600 دراسة تاريخ مملكة البحرين ومنطقة الخليج العربي ويُظهر تعداد للأحداث الهامة في البحرين ومنطقة الخليج العربي وأثارها على الوضع الراهن ، و يغطي الأهمية الاستراتيجية والمكانية للبحرين للبحرين بدءاً من الحضارات القديمة و مروراً إلى العهد الاسلامي، والاحتلال البرتغالي، وصراع القوى في القرن السابع عشر، وصعود قبيلة العتوب، والبحرين تحت الحماية البريطانية وإبرام المعاهدات مع بريطانيا، وانسحاب القوات البريطانية من البحرين والخليج، ويتناول وصف الاماكن والشخصيات والتطورات التاريخية والانجازات في البحرين في عهد حكام البحرين، والبعد العربي والاسلامي في تكوين هوية البحرين ، الانضمام لمجلس التعاون الخليجي ، وتاريخ دول الخليج العربي (دول مجلس التعاون الخليجي)، ومع نهاية الكورس يكون الطالب قادر على تحليل الجذور التاريخية للبحرين لتكوين الهوية الوطنية ، والتمتع بمقدرة الاتصال الشفهي والكتابي والعمل بشكل منتج وفعال ضمن فريق واحد.</p> <p>This Course includes the history of the Kingdom of Bahrain and the Arabian Gulf region. It includes the important events in Bahrain and the Arabian Gulf region and their impact on the current situation. It covers the strategic importance of Bahrain, starting with "Ancient civilizations and passing through" the Islamic era, Bahrain's entry into Islam, Portuguese occupation, competition of powers in the 17th century and the rise of a tribe of Al-Atub. It includes the history of Bahrain under the British protection and the conventions between Bahrain and Great Britain up to British troops leaving the region. It describes the places and persons as well as the historical developments and achievement in Bahrain during the time of Al- Khalifah. It includes independence of Bahrain, issuing of the first constitutional law, reform project by His His Majesty King Hamad, constitutional amendments, establishment of GCC, history of Arab Gulf states. It makes the student able to present his patriotic character through historical discussions.</p> | | | | | |

SECOND YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|--------------|---------|---------|--------------|------------------|
| HUMR600 | Human Rights | 3 | 0 | 3 | SOCI600 |
| <p>تناول هذا المقرر تمكين الطالب و جعله قادراً على معرفة الخلفية التاريخية لحقوق الإنسان، المفاهيم و الاصول الفلسفية و الرؤيا الاسلامية لحقوق الانسان كما يتناول بالعرض و التحليل مصادر حقوق الإنسان كالإعلان العالمي لحقوق الإنسان، و العهد الدولي الخاص بالحقوق المدنية و السياسية و العهد الدولي الخاص بالحقوق الاقتصادية و الإجتماعية و الثقافية و الوثائق الدولية الأخرى ذات الصلة بحقوق الإنسان ماورد فيها من الحقوق و التمييز بينها. كما يتناول بالمقاربة ذاتها ما ورد في الوثائق الوطنية مثل دستور مملكة البحرين و الميثاق الوطني و كيفية تطبيقها. و يُمكن الطلبة من مهارات تحليل و تفسير و نقد التطبيقات و التجاوزات فضلاً عن القدرة على التحليل و التواصل و عرض مسائل حقوق الإنسان بمختلف الوسائل.</p> | | | | | |

This course makes the students able to know the background, main concepts of Human Rights and the philosophical thoughts and Islamic view which contribute in modern Human Rights. It makes them able to analyze what is mentioned in different kinds of Human Rights sources as Universal Declaration of Human Rights, International Covenant on Civil and Political Rights and International Covenant on Economic, Social and Cultural Rights. It deals in the same approach with the National Sources of Human Rights such as the Constitutional Law of Kingdom of Bahrain and National Action Charter with applications as well. The course makes the students able to analyze, discuss and debate Human Rights issues in different ways.

| | | | | | |
|---------|----------------------|---|---|---|---------|
| CHEM711 | Analytical Chemistry | 3 | 2 | 4 | CHEM631 |
|---------|----------------------|---|---|---|---------|

This course introduces students to the latest developments in Environmental Analytical Chemistry, focusing on modern techniques used to identify and quantify environmental pollutants. Topics include sample pretreatment methods, chemical species and speciation analysis, and the analysis of pollutants in air, water, and soil. The course also explores advanced sensing technologies for detecting environmental contaminants and emphasizes rapid, on-site analytical techniques for responding to environmental emergencies.

| | | | | | |
|---------|---|---|---|---|---------|
| MATH712 | Integral Calculus with Differential Equations | 5 | 0 | 5 | MATH632 |
|---------|---|---|---|---|---------|

This course provides the students with knowledge and understanding of core concepts, theories and principles in evaluating definite and indefinite integrals and its applications in solving engineering and computing problems. The course also covers solutions to ordinary differential equations which can be used in modeling important applications in the scientific and engineering fields.

| | | | | | |
|---------|-------------------|---|---|---|---------|
| ENGL711 | Technical Writing | 3 | 0 | 3 | ENGL621 |
|---------|-------------------|---|---|---|---------|

This is an advanced course in English academic writing designed to deal with the application of the technical writing principles with the correspondence on business, science, and technology. It aims to develop the technical writing skills and communication of the college students thru the discussions of its elements and ethics with the use of digital technologies. Furthermore, it enables students to adapt the various communication routes in the workplace, to conceptualize suitable contents of technical writing, to understand the characteristics and other methods of communication techniques, to plan and organize advanced level tasks and to work effectively and with accountability with other team members in a creative and productive manner, in any language learning scenario when achieving personal and group outcomes.

| | | | | | |
|---------|----------------------|---|---|---|---------|
| PHYS631 | University Physics 1 | 2 | 2 | 3 | MATH632 |
|---------|----------------------|---|---|---|---------|

This course is designed to explore the concepts of motion using vectors and other mathematical models and their advanced application, such as the application of Newton's laws of motion, projectile motion, work, energy, momentum and impulse, rotational dynamics, equilibrium of a rigid body, and periodic motion.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|-------------|----------------------------|------------|------------|-----------------|------------------|
| MATH621 | Probability and Statistics | 3 | 0 | 3 | MATH611 |

This course provides a demonstration of the main concepts of probability and statistics with applications. IT

also covers identifying the theorem of probability and linked with real life problems. How to differentiate between the combination and permutation, Explain how to find the mean and variance from the moment generating function. Explain and interpret the findings from different hypothesis tests for decision making. Finally, SPSS will be used to run the statistical measures (e.g. hypothesis tests and regression model)

| | | | | | |
|---------|----------------|---|---|---|---------|
| ENGG724 | Thermodynamics | 3 | 0 | 3 | PHYS631 |
|---------|----------------|---|---|---|---------|

Thermodynamics deals with the study associated with details of the properties of the pure substance to adept the necessary process related to energy concepts, ideal gas laws, work and heat, processes of ideal gases, and gas and steam cycles. It also includes a critical evaluation of various laws and its practical applications of thermodynamic principles in power plan.

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|---------|----------------------------|---|---|---|---------|
| CHEM722 | Environmental Biochemistry | 2 | 2 | 3 | SCIE611 |
|---------|----------------------------|---|---|---|---------|

This course provides students with knowledge on the fundamental principles of chemistry applied to life processes. It covers chemistry of important constituents of living matter, biosynthesis, bioenergetics, metabolic control, and transport mechanism. The laboratory part includes the separation, identification, and characterization of biomolecules.

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|---------|---------------------|---|---|---|---------|
| ENGG722 | Engineering Economy | 3 | 0 | 3 | MATH611 |
|---------|---------------------|---|---|---|---------|

This course deals with the advanced study of the core theories, principles and concepts of economic environment, interest and money-time relationship, depreciation, capital financing, comparing alternatives, replacement studies, break-even analysis, benefit cost ratio, and benefit cost difference. It presents mathematical techniques and practical advice for evaluating decisions in the design and operation of engineering systems.

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|---------|----------------------|---|---|---|---------|
| PHYS711 | University Physics 2 | 2 | 2 | 3 | PHYS631 |
|---------|----------------------|---|---|---|---------|

This course is designed to explore the concepts of electricity and magnetism using the concepts of mechanics, vectors, and other mathematical models and their advanced application, such as application of Coulomb's law, Gauss's law, Ohm's law, Kirchhoff's laws, electric potential and potential difference, basic circuits, series and parallel circuits and combinations, magnetic field and flux, induced EMF and applications such as electric motors and basic AC electric generators.

| | | | | | |
|---------|---|---|---|---|---------|
| ENVE721 | Fundamentals of Environmental Engineering | 3 | 0 | 3 | SCIE611 |
|---------|---|---|---|---|---------|

This course introduces the principles and practices related to the environmental engineering field. Topics include water and wastewater treatment, air pollution control, solid and hazardous waste management, environmental sustainability, and the impact of human activities on natural systems. The course will provide a foundation for students to understand the environmental challenges and focus on the sustainable solutions.

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|---|----------------|---------|---------|--------------|------------------|
| MATH733 | Linear Algebra | 2 | 2 | 3 | MATH712 |
| This course use specialist level skills to relate to and adapt main and core theories and concepts in the study | | | | | |

of matrices and determinants, and their applications in numerical solutions of systems of linear equations. It also includes important topics such as linear transformations, eigenvalues and eigenvectors, complex vectors and matrices and numerical linear algebra. In the laboratory, MATLAB is used as a mathematical software and solutions to a variety of mathematical problems are determined.

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|---------|--------------------|---|---|---|---------|
| CHEM723 | Physical Chemistry | 2 | 2 | 3 | CHEM711 |
|---------|--------------------|---|---|---|---------|

This course presents an intensive overview of the laws of thermodynamics followed by applications to the properties of gases, liquids, and solids, as well as chemical reaction thermodynamics and the kinetic theory of gases at equilibrium. It also deals with the study of chemical kinetics with applications to gases, solutions, and phase equilibria to provide a firm foundation for understanding the physical principles that govern chemical and biological systems. Laboratories cover physical chemistry techniques drawn from these areas.

| | | | | | |
|---------|--------------------|---|---|---|---|
| ENGG723 | Safety Engineering | 2 | 0 | 2 | - |
|---------|--------------------|---|---|---|---|

This course deals with the detailed study of the principles of safety engineering and applications of safety principles to industrial and commercial systems. It covers topics concerning safety management, occupational health, fire prevention and control, electrical safety and environmental safety. Further, students will learn how to conduct risk analysis and some of the mitigation measures.

| | | | | | |
|---------|---------------------------------|---|---|---|---------|
| ENVE722 | Unit Operation: Fluid Mechanics | 2 | 2 | 3 | ENGG724 |
|---------|---------------------------------|---|---|---|---------|

This is an introduction to the phenomena and principles of fluid flow. The course discusses fluid properties, fluid statics, conservation of mass, momentum, and energy. Emphasis is on quantitative analysis of velocities, pressures, shear stress, and flow forces. Measurement of fluid properties, pressures, velocities, and flow forces are performed in laboratory sessions.

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|---------|----------------------------|---|---|---|---------|
| SCIE723 | Environmental Microbiology | 2 | 2 | 3 | SCIE611 |
|---------|----------------------------|---|---|---|---------|

This course discusses the diversity, structure, and role of microorganisms in the environment and environmental engineering systems for enhancement of an environment using various microbiological techniques offering a perfect balance of microbiological knowledge and environmental biotechnology principles.

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|---------|-----------------------|---|---|---|---------|
| ENGG725 | Engineering Mechanics | 3 | 0 | 3 | PHYS711 |
|---------|-----------------------|---|---|---|---------|

This course deals with the core theories, principles and concepts of force systems, force components, free body diagrams, vectors, resultant of force systems, moment of forces, and equilibrium of rigid bodies. It also includes critical analysis of structures, methods of analysis of trusses, and, distributed forces centroids and center of gravity, and the theory and application of friction.

THIRD YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|-------------|-----------------|---------|---------|--------------|-------------------|
| CHEM811 | Water Chemistry | 2 | 2 | 3 | CHEM631 / CHEM722 |

This course is a study of geochemical and biochemical processes that influence the chemical makeup of water. Emphasis is placed on controls affecting the chemical quality of natural waters and models used to describe the presence and concentration of dissolved inorganic and organic constituents and dissolved gases. Techniques used to interpret and evaluate chemical analyses are covered along with sampling methods and use of standard water testing equipment.

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|---------|----------------------|---|---|---|---------|
| MATH722 | Advanced Mathematics | 2 | 2 | 3 | MATH712 |
|---------|----------------------|---|---|---|---------|

This course deals with the study of complex numbers, series solutions of ordinary differential equations by power series, Bessel Function, Frobenius method. Basics of Fourier series, Fourier transform, Laplace and inverse Laplace Transforms. Using MATLAB or other mathematical software in order to solve mathematical problems.

| | | | | | |
|---------|-----------------------|---|---|---|---------|
| ENGG814 | Engineering Materials | 3 | 0 | 3 | CHEM611 |
|---------|-----------------------|---|---|---|---------|

This course deals with the study the core principle and concept of engineering material science. It covers the defining features of properties and structure of different engineering materials. It discusses the classifications of materials such as metals, polymers, ceramics, and composites. It also covers the formation of bonds and forces between particles, amorphous and crystalline structure, the impact factor, solid solutions and phase diagram, and defects in crystalline materials. It also covers the analysis of the physical, mechanical, electrical and magnetic properties of materials. This also emphasizes the various considerations in selecting materials appropriate for a particular application.

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|---------|-------------------------------|---|---|---|---------|
| ENVE811 | Unit Operation: Heat Transfer | 2 | 2 | 3 | ENGG724 |
|---------|-------------------------------|---|---|---|---------|

This course covers the basic principles of heat fluxes, in the forms of conduction, convection, and radiation of heat. Analytical and numerical methods are presented for two-dimensional conduction problems. Specific topics include forced convection in laminar and turbulent flows; heat transfer at low rates, evaporation; and thermal radiation. Problems and examples will emphasize modeling of complex systems drawn from environmental applications such as water and waste management.

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|---------|--|---|---|---|---|
| ENGG852 | Professional Ethics and Engineering Laws | 1 | 0 | 1 | - |
|---------|--|---|---|---|---|

This course explores the core theories, principles and concepts in the field of ethics as it relates to engineering practice. This framework is used to examine several case studies of ethical problems in engineering. It discusses the core concepts of environmental protection and sustainability to understand how they relate to engineering ethics. The course is intended to promote greater reflection by engineers on their activities to better understand the social dimensions of engineering practice.

| | | | | | |
|---------|-----------------------|---|---|---|---------|
| CHEM812 | Atmospheric Chemistry | 3 | 0 | 3 | CHEM631 |
|---------|-----------------------|---|---|---|---------|

This course deals with the chemical processes of the Earth's atmosphere. The topics include atmosphere layer, atmospheric transport, biogeochemical cycles of gaseous nitrogen, oxygen, carbon and sulfur compounds, aerosol, fog, smog and acid rain, troposphere air pollutions, ozone hole and stratosphere ozone depletion, greenhouse gases and global warming, industrial revolution and climate change, important chemical kinetics in atmospheric layer

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|---|--------------------------------|---------|---------|--------------|------------------|
| ENVE821 | Water Resources Engineering | 3 | 0 | 3 | CHEM811 |
| <p>This course that focuses on the concept, theory, design, and operation of urban water supply systems. Emphasis will be placed upon a fundamental understanding of commonly used water collection and treatment technologies. Major sections of the course cover water cycle, water consumption and demand, water collection, storage and transportation, drinking water quality, conventional surface water treatment unit operations and processes, advanced water treatment technologies, water stabilization and corrosion control, urban water distribution and transmission, water reclamation and total water management. The course aims to introduce to students the basic concept of water resources engineering and the knowledge of urban water supply. At the end of this course, students who fulfill the requirement of the course will be able to present the principles and theories behind the common water collection and treatment technologies and to conduct conceptual design of freshwater collection systems, common surface water treatment processes and urban water distribution systems.</p> | | | | | |
| ENVE822 | Instrumentation and Control | 2 | 2 | 3 | CHEM711 |
| <p>This course focuses on the concepts of instrumentation and measurement. The components of instrumentation (transducers, amplifiers, filters) are discussed. Specific measurement techniques including mass spectrometry, spectroscopy, chromatography (gas, ion exchange, HPLC), electro-chemical probes (membrane electrodes), biosensors and remote sensor devices are covered with emphasis on selection of methods and practical applications in environmental monitoring. Database management, data analysis, statistical treatment of data. Development of optimum monitoring strategy, scheduling, sampling frequency. The course includes laboratory exercises.</p> | | | | | |
| ENVE823 | Unit Operation: Mass Transfer | 2 | 2 | 3 | ENVE811 |
| <p>This course introduces the student to basic principles of mass transfer operations and their applications in the chemical industry, such as diffusion, absorption, extraction, distillation, evaporation, drying, fluidization, size reduction, and mechanical separations. Description of the equipment used for the above operations, is also dealt with.</p> | | | | | |
| MATH732 | Numerical Methods and Analysis | 2 | 2 | 3 | MATH722 |
| <p>This course demonstrates critical knowledge and understanding of specialist theories, principles and concepts of the study of numerical approximations and errors, numerical solutions of non-linear equations, interpolation and curve fittings, numerical differentiation and integration. The course also covers analysis of accuracy of numerical differentiation and integration methods and solution of initial value problems using Euler Method. Analysis of accuracy of Euler's method. The course also includes laboratory components that make use of MATLAB as tool in solving problems in Numerical Analysis.</p> | | | | | |
| ENVE824 | Air Pollution and Prevention | 3 | 0 | 3 | ENVE721 |



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This course provides a comprehensive overview of air pollution, including its sources, types, and environmental and health impacts. Students will explore atmospheric processes, air quality standards, and monitoring techniques. The course also emphasizes pollution control technologies and strategies for the prevention and mitigation of air pollution in industrial and urban settings. Practical case studies and regulatory frameworks will be examined to understand sustainable approaches to air quality management.

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|---------|---|---|---|---|---------|
| ENVE825 | Unit Operation: Physical and Chemical Treatment | 2 | 2 | 3 | ENVE722 |
|---------|---|---|---|---|---------|

This course serves as the unit operations course for physical and chemical treatment of water and wastewater. Detailed concepts of physical-chemical processes that affect water quality in natural and engineered environmental systems. Focus is on developing a qualitative understanding of mechanisms as well as quantitative tools to describe, predict, and control the behavior of physical-chemical processes. Topics include reactor hydraulics and reaction kinetics, gas transfer, adsorption, particle characteristics, flocculation, gravitational separations, filtration, membranes, and disinfection.

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|--|----------------|----------------|---------------------|-------------------------|
| ENVE831 | Air Quality Engineering | 3 | 0 | 3 | ENVE824 |
| Problems and methodologies for studies of environmental management, with an emphasis on air pollution. Key topics include source of pollutants; focusing on combustion chemistry for a hydrocarbon fuel; behavior of gaseous and particulate pollutants in the atmosphere, including the role of meteorology and the use of dispersion equations; effect of pollutants on human health and global climate; and procedures by which air pollution standards are developed and enforced by regulatory agencies. Statistical treatment of data is included at several places in the course. | | | | | |
| ENVE832 | Soil Engineering | 3 | 0 | 3 | ENVE821 |
| Soil Engineering introduces knowledge and concepts of soil behavior and gives an introduction into general geotechnical engineering. The course describes the relationship between soils and its geological origins and demonstrates the significance of the particles size distribution and mineralogy of the soil on its engineering behaviour. The effects of the compaction process on the engineering properties of soil are discussed and methods are developed to allow students to design fills. The course explains the principle involved in the flow of water through soils, including the methods of analysis and the use of these methods to estimate water pressures and flows in a variety of differing engineering situations. The course discusses the shear strength of soils and develops methods for applying this knowledge in the analysis of bearing pressure for foundations and in the estimation of earth pressures behind earth retaining structures. Methods of analysis of the consolidation of soils are discussed and analytical methods are developed to estimate ground movements due to the consolidation of the soil. | | | | | |
| ENVE833 | Environmental Engineering Laws and Regulations | 3 | 0 | 3 | ENVE722 |





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An Overview of Environmental Law and its Development, Legal and Administrative Structures for their Implementation from the International, Regional and National Perspectives, Focus on Basic Pollution Laws relating to Air, Water, Waste, Hazardous Substance and Nature Conservation Laws and Laws Governing Environmental Impact Assessment, Bahraini laws and the laws of selected countries, Application of Policy Issues in Environmental Management and the Political Economy of Environmental Regulations.

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|---------|---|---|---|---|---------|
| ENVE834 | Environmental Quality Systems Engineering | 3 | 0 | 3 | ENVE721 |
|---------|---|---|---|---|---------|

This course provides a comprehensive overview of engineering approaches used to monitor, manage, and enhance environmental quality. It emphasizes the integration of scientific principles and engineering practices to address key environmental challenges related to air, water, soil, and solid waste. Core topics include environmental regulations and standards, pollution control technologies, environmental management systems (EMS), and quality monitoring tools. The course places special emphasis on Environmental Management Systems (EMS), particularly the ISO 14001 standard, as a structured approach to achieving environmental performance and regulatory compliance. The course will explore the key components of EMS, including policy development, planning, implementation, monitoring, internal auditing, and continuous improvement. Through data-driven evaluation methods and applied case studies, students will gain practical experience in designing, implementing, and assessing EMS frameworks that drive environmental accountability, support organizational sustainability goals, and ensure alignment with international environmental standards.

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|---------|---|---|---|---|---------|
| ENVE835 | ENVE Unit Operation: Biological Treatment | 2 | 2 | 3 | SCIE723 |
|---------|---|---|---|---|---------|

This course explores the theory and application of biological processes used in the treatment of municipal and industrial wastewater and biosolids. It emphasizes the integration of microbiological fundamentals within an engineering framework to analyze, design, and manage environmental biological systems. Key topics include microbial stoichiometry, energetics, and reaction kinetics, as well as suspended and attached growth processes, nutrient and carbon cycling, and bioremediation techniques. The course focuses on understanding, predicting, and controlling biological treatment systems to improve water quality.

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|---------|-------------------|---|---|---|---------|
| ENVE836 | Technopreneurship | 3 | 0 | 3 | ENGG722 |
|---------|-------------------|---|---|---|---------|

This course provides advanced concepts, facts and ideas of starting a business, working for an entrepreneurial company or working with entrepreneurial firms as an investor or advisor. The course is designed to demonstrate necessary techniques and tools to planning and organizing business and is aimed to integrate the overall dimensions of entrepreneurship, including identifying a winning business opportunity, gathering funding for and launching a business, growing the organization and harvesting the rewards. In particular topics covered different types of entrepreneurs, its importance for economies, business model creation, financial evaluation and financing the start-up.

FOURTH YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB | CREDIT | PREREQUISITE |
|-------------|--------------|---------|-----|--------|--------------|
|-------------|--------------|---------|-----|--------|--------------|



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| | | | Hrs | UNITS | |
|---------|---|---|-----|-------|---------|
| ENVE837 | Methods of Research with Inferential Statistics | 3 | 0 | 3 | MATH621 |

This course involves the development and analysis of experimental design. Students will also be introduced to some of the methods of statistical analysis frequently used in the environmental field such as two-way ANOVA, cluster analysis, multiple regression, population estimation models..

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|---------|------------------------------------|---|---|---|---------|
| ENVE838 | Project and Engineering Management | 3 | 0 | 3 | ENGG722 |
|---------|------------------------------------|---|---|---|---------|

This course provides critical knowledge and understanding of project management and the essential tools needed to deliver successful projects based on agreed scope, time and budget from the standpoint of the project manager, who must skillfully initiate, plan, organize, implement and control non-routine activities to successfully complete the projects based on the metrics. Topics include project life cycles, principles, and concepts of strategic management process in project selection and organization, project cost and time estimation. Students will be exposed to the different cost estimation tools as well the use of PERT- CPM and Gantt Charts to monitor progress, in addition to methods in performing project audits, and risk management to critically evaluate various project management situations.

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|---------|-----------------------|---|---|---|---------|
| ENVE839 | Engineering Hydrology | 3 | 0 | 3 | ENVE821 |
|---------|-----------------------|---|---|---|---------|

This course provides a comprehensive study of hydrology, focusing on the principles and processes of the hydrologic cycle. Topics include the forms and measurement of precipitation, analysis of hydrological data, and application of the hydrological equation. Students will explore various water loss mechanisms such as evaporation, infiltration, transpiration, and watershed leakage. The course examines catchment characteristics, soil moisture dynamics, runoff processes, and techniques for flood estimation and control, including flood and reservoir routing. Special attention is given to the hydrology of arid and semi-arid regions. Hydrograph analysis and groundwater fundamentals are covered extensively, including occurrence, distribution, movement, exploration, and recharge. The course also addresses well hydraulics and design, interaction between groundwater and surface water, pumping test design, and introduces groundwater modeling concepts, including leaky aquifers and saltwater intrusion. This course equips students with the knowledge necessary for effective water resource management and hydrological engineering.

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|---------|--------------------------|---|---|---|---------|
| ENVE840 | Oil and Gas Technology 1 | 3 | 0 | 3 | ENVE821 |
|---------|--------------------------|---|---|---|---------|

This course integrates core theories of process overview in oil and gas technology. Students will be provided with the detailed knowledge and understanding on various main process involved in the oil and gas exploration and also provides detailed insight on various utility system and their working principles used in oil and gas technology. The course also covers topics on maintained of oil and gas well.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|-------------|-----------------------------------|---------|---------|--------------|------------------|
| ENVE841 | Environmental Planning and Design | 3 | 0 | 3 | ENVE834 |

This course introduces the practices of environmental planning and sustainable design. It emphasizes the

integration of environmental, social, and economic factors in land use and infrastructure development. Topics include environmental impact assessment, site planning, stormwater and flood management, climate-resilient urban design, and the use of tools such as GIS in decision-making. Students will also examine regulatory frameworks, stakeholder engagement, and strategies for balancing development with environmental protection across urban and rural settings.

| | | | | | |
|---------|-----------------------|---|----|---|-------------------------------|
| ENVE842 | Industrial Attachment | 0 | 12 | 6 | 4 TH Year Standing |
|---------|-----------------------|---|----|---|-------------------------------|

This course is the practicum course where the students are exposed to actual work environment. The students are required to complete 240 hours of on-site training. They are sent to work environments under the supervision of a practicum professor. Moreover, at the end of the course, individual student submits a final report and a performance evaluation made by the on-site supervisor.

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|---------|---|---|---|---|---------|
| ENVE843 | Environmental Engineering Design Project A | 3 | 0 | 3 | ENVE838 |
|---------|---|---|---|---|---------|

This course provides the senior engineering student with meaningful problem analysis and design experience. The project and its documentation must illustrate use of fundamental elements of the design process: establishment of objectives and criteria, synthesis, analysis, testing, and evaluation. The project report must address realistic constraints including economic factors, safety, aesthetics, ethics, and social impacts.

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE |
|-------------|------------------------|---------|---------|--------------|---------------|
| ENVE844 | Wastewater Engineering | 3 | 0 | 3 | ENVE835 |

This course provides a comprehensive study of wastewater engineering, beginning with the characterization of wastewater, its sources, and flow patterns. It introduces essential plumbing concepts and emphasizes the design, layout, and hydraulic features of wastewater collection systems, including their operation, maintenance, and rehabilitation. Students will gain foundational knowledge of flow modeling tools used for analyzing and optimizing collection networks. The course covers the design and operational principles of wastewater treatment processes at the primary, secondary, and tertiary levels. Sludge handling techniques such as digestion, stabilization, and dewatering are also addressed. Additionally, the course will examine wastewater reclamation and reuse, land treatment systems, and decentralized onsite solutions. Regulatory standards, effluent quality concerns, and the broader environmental impacts of wastewater management will be discussed throughout.

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|---------|--------------------------|---|---|---|---------|
| ENVE845 | Oil and Gas Technology 2 | 3 | 0 | 3 | ENVE840 |
|---------|--------------------------|---|---|---|---------|

This course integrates advanced theories of process overview in oil and gas technology. Students will be provided with the detailed knowledge and understanding on various main process involved in the oil and gas exploration and also provides detailed understanding of the oil and gas life cycle, the midstream and downstream aspects of the oil and gas industry such as, topsides facilities, refinery operations, gas processing, product transportation as well as economy aspects and environmental issues.

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|---|--|---|---|---|---------|
| ENVE846 | Environmental Impact Assessment | 3 | 0 | 3 | ENVE834 |
| <p>The course covers the three primary processes of a quality system include: (1) core processes, their outputs, and the identification of significant environmental aspects and impacts, (2) key supporting processes, such as those for maintaining awareness of legal requirements, ensuring competency of employees, providing infrastructure, communicating quality system information, and monitoring and evaluating environmental performance, (3) management system supporting processes, such as document control, record control, and internal auditing.</p> | | | | | |
| ENVE847 | Environmental Engineering Design Project B | 3 | 0 | 3 | ENVE834 |
| <p>This course is a continuation of Environmental Engineering Project Design A (ENVE843) which enables students to design a system, component, or process to meet desired needs within realistic constraints through a culminating major design experience or capstone based on the knowledge and skills acquired in foundation and core courses and incorporating appropriate engineering standards (IEEE, ISO) as an integral part and with due consideration of multiple realistic constraints tradeoffs.</p> <p>This is a group supervised design project in which students analyze, specify, design, construct, evaluate and adapt physical computing applications in smart environments and embedded systems. They also incorporate design standards and make decisions as a result of multiple design tradeoff/constraints (economics, environmental, social, political, ethical, health and safety, manufacturability, and sustainability) analysis and evaluation as part of the design process.</p> | | | | | |

TECHNICAL ELECTIVES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE |
|--|----------------------------|---------|---------|--------------|--------------|
| ENVE848 | Renewable Energy | 2 | 2 | 3 | ENVE834 |
| <p>This course will provide students with the design tools, and state-of-the-art alternative energy technologies. The course is broken into two parts: the first part discusses alternative energy technologies such as wind, hydro, geothermal, ocean thermal energy conversion, and economics of alternative energy; the second part of the course deals with solar energy fundamentals and design/performance evaluation of solar collectors, passive and active applications of solar energy, thermal and electric energy storage, and alternative fuel technologies for transportation and power technologies.</p> | | | | | |
| ENVE849 | Climate and Global Warming | 2 | 2 | 3 | ENVE834 |
| <p>This course explores the scientific foundations and consequences of climate change and global warming—critical environmental, social, and economic challenges driven largely by human activity. It examines the Earth's climate system, including atmospheric and oceanic circulation, the greenhouse effect, and natural climate variability such as El Niño. Emphasis is placed on understanding the scientific principles underlying climate change, interpreting observed evidence from past and present climates, and analyzing projections of future climate scenarios. Topics include climate modeling, global warming trends, and the environmental and</p> | | | | | |

societal impacts of climate change.

ENVE850

Remote Sensing

2

2

3

ENVE834

This course emphasizes the understanding of the aerospace remote sensing foundations and the use of remote sensor data and image interpretation and processing techniques for environmental and urban applications. Specifically, the course will cover concepts and foundations of remote sensing, aerial photography and photogrammetry, visual image interpretation, characteristics of various sensing systems and an introduction to digital image processing techniques.

ENVE851

Hazardous Waste Management and
Remediation

2

2

3

ENVE835

This course includes hazardous waste management issues, programs, environmental regulations, handling of hazardous wastes, risk assessment, characterization, storage, disposal, and site remediation processes and remedial alternatives and implementation. It also covers management, planning, legal and engineering aspects of liquid and solid hazardous waste treatment and disposal.

ENVE852

Introduction to GIS

2

2

3

ENVE836

This course introduces the concepts and components of a geographic information system (GIS). It also teaches the essential skills of operating a functional GIS through the use of ArcGIS software package. By completing this course, students will understand the operational processes of spatial data acquisition, editing and QA/QC, metadata development, geodatabase design, spatial query and display, spatial analysis and modeling, preliminary GIS application development, cartographic mapping and dynamic visualization, and GIS implementation basics. Students will also be exposed to Google Earth and common open source GIS tools, as well as the basic concepts of remote sensing and Global Positioning System (GPS).

ENVE853

Advanced Topics in Environmental
Engineering

2

2

3

ENVE837

This course explores advanced concepts and current issues in the field of environmental engineering. It focuses on cutting-edge technologies, regulatory frameworks, and innovative problem-solving approaches related to environmental sustainability. Students will engage in case studies, research discussions, and projects that highlight the effectiveness of sustainable development goals toward environmental protection.



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|--|--|
| 1. Teaching Institution | University of Technology Bahrain (UTB) |
| 2. University Department | College of Engineering (COE) |
| 3. Programme Title | Bachelor of Science in Informatics Engineering (BSIE) |
| 4. Title of Final Award | Bachelor of Science in Informatics Engineering (BSIE) |
| 5. Mode of Attendance | Actual classroom learning-interactive (Full-time) |
| 6. Delivery Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | NQF Level 8 612 NQF Credits (204 ACS Credits) |
| 8. Accreditation | ABET-EAC |
| 9. Other external influences | Local External Influences/References <ul style="list-style-type: none">- Ministry of Education (MOE), Higher Education Council (HEC)- Education and Training Quality Authority (BQA) International External Influences/References <ul style="list-style-type: none">- Accreditation Board for Engineering and Technology (ABET) |
| 10. Date of production/revision of this specification | September 2023 |
| 11. Aims of the Programme | |
| <p>The Bachelor of Science in Informatics Engineering (BSIE) is an engineering programme which combines computer technology with engineering concepts. It is an interdisciplinary scientific area focusing on the application of advanced computing, information and communication technologies to engineering. It covers the design and development of intelligent engineered products and processes enabled by the integration of computers, control systems and software engineering technologies.</p> <p>The objectives of the Informatics Engineering programme are to produce graduates who will be able:</p> <ol style="list-style-type: none">1. Pursue careers in Informatics Engineering or related fields towards the improvement of engineering practice.2. Engage in lifelong learning toward completion of advanced/continuing education or other learning opportunities.3. Demonstrate professional success through strengthened networks and/or positions of increasing social responsibility. | |
| 12. Programme Intended Learning Outcomes | |
| <p>At the completing the programme, the student will be able to:</p> <ol style="list-style-type: none">1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic | |





factors

3. Communicate effectively with a range of audiences
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. Acquire and apply new knowledge as needed, using appropriate learning strategies

Teaching and Learning Methods

5. Constructive Method: Students are required to be fully engaged and active in the process of constructing meaning and knowledge based on their prior knowledge and experiences through the process of doing, making, writing, designing, creating and solving. Teachers implement differentiated learning, authentic assessment practices and incorporate technologies to improve individual learning experiences. It includes simulations, in-course projects, digital content, group discussions and reflections. This method strives to improve achievement by consciously developing students' ability to consider ideas, analyze perspectives, solve problems and make decisions on their own, thereby making them more responsible and independent.
6. Inquiry based Method. Students develop cognitive skills like critical thinking and problem solving by working on questions, problems, or scenarios and formulating creative solutions. The teachers use structured, guided or open inquiry to facilitate learning. As a process, students are involved in their learning by formulating questions, investigating, building their understanding and creating meaning and new knowledge on a certain lesson. Typically, activities include laboratory sessions.
7. Collaborative Method. Students are divided into small groups to learn something together and capitalize on one's other resources and skills, evaluating one another's ideas, and monitoring one another's work. It allows students to actively interact by sharing experiences and take on different roles. Typically, students are provided with problems or projects that they work on together to search for understanding, meaning, or solutions and each group is expected to work together developing or formulating solutions and present the solution in class. The activities include think-pair-share, jigsaw, or round-robin which effectively engage students to complete the tasks.
8. Experiential learning method. By engaging students to hands on experience which attempts to apply theories and knowledge learned in the classroom to real-world situations. This includes team challenges, simulations, internships, capstone projects, and other extracurricular activities.

Assessment Methods

Assessment is through a combination of written examinations (essays, class tests, homework) and assessed coursework (final in-course project, problem sets, laboratory exercises and machine problems).



13. Programme Structure**BACHELOR OF SCIENCE IN INFORMATICS ENGINEERING (BSIE)****CURRICULUM PLAN EFFECTIVE AY 2022-2023****FOUNDATION COURSES**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PREREQUISITE(S) |
|-------------|---------------------------|------------|------------|-----------------|-----------------|
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------|--------------------------------|------------|------------|-----------------|-----------------|
| ARAB600 | Arabic Language | 3 | 0 | 3 | |
| CHEM611 | General Chemistry | 2 | 2 | 3 | |
| IENF611 | Introduction to Computing | 2 | 2 | 3 | |
| ENGL611 | English Communication Skills 1 | 3 | 0 | 3 | |
| EUTH500 | Euthenics | 1 | 0 | 0 | |
| MATH631 | Calculus 1 | 5 | 0 | 5 | |
| TOTAL | | | | 17 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------|-----------------------------------|------------|------------|-----------------|-----------------|
| IENF621 | Computer Programming | 2 | 2 | 3 | IENF611 |
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
| HIST600 | History of Bahrain and GCC Region | 3 | 0 | 3 | |
| MATH711 | Calculus 2 | 5 | 0 | 5 | MATH631 |
| HUMR600 | Human Rights | 3 | 0 | 3 | |
| TOTAL | | | | 17 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|-------------------------------|------------|------------|-----------------|-----------------|
| IENF631 | Advanced Programming | 2 | 2 | 3 | IENF621 |
| ENGL631 | Speech and Oral Communication | 2 | 2 | 3 | ENGL621 |
| SCIE631 | Biology | 2 | 2 | 3 | |

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| | | | | | |
|--------------|----------------------------|---|---|-----------|---------|
| MATH621 | Probability and Statistics | 3 | 0 | 3 | |
| PHYS631 | University Physics 1 | 2 | 2 | 3 | MATH631 |
| ENVS711 | Environmental Science | 3 | 0 | 3 | |
| TOTAL | | | | 18 | |

SECOND YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-------------------------------|--------------------|--------------------|-------------------------|------------------------|
| IENF711 | Data Structures and Algorithm | 2 | 2 | 3 | IENF631 |
| ENGL711 | Technical Writing | 3 | 0 | 3 | ENGL621 |
| ENGG711 | Engineering Drawing | 2 | 2 | 3 | |
| MATH722 | Advanced Mathematics | 3 | 0 | 3 | MATH711 |
| MATH622 | Discrete Mathematics | 3 | 0 | 3 | MATH631 |
| PHYS711 | University Physics 2 | 2 | 2 | 3 | PHYS631, MATH711 |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|------------------------------|--------------------|--------------------|-------------------------|------------------------|
| ENGG721 | Electric Circuit Theory 1 | 2 | 2 | 3 | PHYS711 |
| IENF721 | Principles of Communications | 2 | 2 | 3 | PHYS631 |
| IENF722 | Database Systems | 2 | 2 | 3 | IENF711 |
| IENF723 | Introduction to Data Science | 2 | 2 | 3 | IENF711 |
| MATH731 | Multivariate Calculus | 2 | 2 | 3 | MATH711 |
| PHYS722 | University Physics 3 | 2 | 2 | 3 | PHYS711 |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--------------------------------|--------------------|--------------------|-------------------------|------------------------|
| ENGG734 | Signals and Systems | 2 | 2 | 3 | ENGG721 |
| ENGG733 | Engineering Economy | 3 | 0 | 3 | MATH621 |
| ENGG731 | Electronics 1 | 2 | 2 | 3 | ENGG721 |
| ENGG732 | Electric Circuit Theory 2 | 2 | 2 | 3 | ENGG721 |
| MATH732 | Numerical Methods and Analysis | 2 | 2 | 3 | MATH722 |
| MATH733 | Linear Algebra | 2 | 2 | 3 | MATH731 |
| TOTAL | | | | 18 | |

THIRD YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-------------------------|----------------|----------------|---------------------|------------------------|
| ENGG813 | Digital Logic Design | 2 | 2 | 3 | ENGG731 |
| IENF811 | Computer Networks 1 | 2 | 2 | 3 | IENF721 |
| ENGG812 | Electronics 2 | 2 | 2 | 3 | ENGG731 |
| IENF812 | Artificial Intelligence | 2 | 2 | 3 | IENF723 |
| ENGG811 | Electromagnetics | 3 | 0 | 3 | ENGG732 |
| MATH821 | Optimization Methods | 3 | 0 | 3 | MATH732 |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|------------------------|
| IENF821 | Computer Networks 2 | 2 | 2 | 3 | IENF811 |
| IENF822 | Advanced Digital Logic Design | 2 | 2 | 3 | ENGG813 |
| IENF823 | Computer Organization and Architecture | 2 | 2 | 3 | ENGG813 |
| IENF824 | Power Electronics | 2 | 2 | 3 | ENGG812 |
| ENGG821 | Control Systems | 2 | 2 | 3 | ENGG734 |
| ENGG831 | Engineering and Project Management | 3 | 0 | 3 | ENGG733 |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-----------------------------|----------------|----------------|---------------------|------------------------|
| IENF831 | Computer Networks 3 | 2 | 2 | 3 | IENF821 |
| IENF832 | Operating System | 2 | 2 | 3 | IENF722 |
| IENF833 | Machine Vision | 2 | 2 | 3 | IENF812 |
| IENF834 | Systems Analysis and Design | 2 | 2 | 3 | IENF722 |
| IENF835 | Cloud Computing | 2 | 2 | 3 | IENF821 |
| ENGG842 | Safety Engineering | 2 | 0 | 2 | IENF824 |
| TOTAL | | | | 17 | |

FOURTH YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|------------------------|
| IENF841 | Digital Systems Design using HDL | 2 | 2 | 3 | IENF822 |
| IENF842 | Wireless Communication Systems | 2 | 2 | 3 | IENF821 |
| ENGG841 | Technopreneurship | 3 | 0 | 3 | ENGG831 |
| IENF843 | Enterprise Networking | 2 | 2 | 3 | IENF821 |
| IENF844 | Microcontroller and Embedded Systems | 2 | 2 | 3 | IENF823 |
| ENGG851 | Professional Ethics and Engineering Laws | 3 | 0 | 3 | ENGG831 |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|--------------------------------|
| IENF851 | Software Engineering | 2 | 2 | 3 | IENF832 |
| IENF852 | Major Elective 1 | 2 | 2 | 3 | IENF821 |
| IENF853 | Major Elective 2 | 2 | 2 | 3 | IENF832 |
| IENF854 | Major Elective 3 | 2 | 2 | 3 | ENGG821 |
| IENF855 | Informatics Engineering Design Project A | 0 | 6 | 3 | Completion of 162 Credit Units |
| IENF856 | Robot Kinematics, Dynamics and Control | 2 | 2 | 3 | ENGG821 |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|------------------------|
| IENF861 | Industrial Attachment | 0 | 6 | 6 | IENF844 |
| IENF862 | Informatics Engineering Design Project B | 0 | 6 | 3 | IENF855 |
| TOTAL | | | | 9 | |
| Grand Total | | | | 204 | |

ELECTIVE COURSES

MAJOR ELECTIVE 1

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|-----------------------|---------|---------|--------------|-----------------|
| IENF852A | Cryptographic Systems | 2 | 2 | 3 | IENF821 |
| IENF852B | Network Security | 2 | 2 | 3 | IENF821 |
| IENF852C | Ethical Hacking | 2 | 2 | 3 | IENF821 |

MAJOR ELECTIVE 2

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|------------------------------------|---------|---------|--------------|-----------------|
| IENF853A | Microprocessor Systems | 2 | 2 | 3 | IENF832 |
| IENF853B | Data Mining | 2 | 2 | 3 | IENF832 |
| IENF853C | Parallel and Distributed Computing | 2 | 2 | 3 | IENF832 |

MAJOR ELECTIVE 3

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|--|---------|---------|--------------|-----------------|
| IENF854A | Special Topics in Computer Engineering | 2 | 2 | 3 | ENGG821 |
| IENF854B | Digital Control Systems | 2 | 2 | 3 | ENGG821 |
| IENF854C | Industrial Control Systems Design | 2 | 2 | 3 | ENGG821 |

14. Awards and Credits

| | |
|-----------------------------|--|
| Degree/ Certificate Awarded | Bachelor of Science in Informatics Engineering |
| Total Units for Degree | 204 |
| Total Trimesters Completed | 12 trimesters |

15. Admission Criteria

Admissions Criteria for Undergraduate Students

G. For First Year Undergraduate Applicants

Acceptance to the University depends on the following admissions requirements:

21. Filled out an admission application form.
22. Minimum secondary school scores 60% or its equivalent.
23. Online Placement test (Oxford Online Placement Test (OOPT)) Result (if needed)
24. Submission of all required documents stated in the Admissions Policy.

To be admitted to any undergraduate programme, the applicant must satisfy the minimum secondary school grades or its equivalent without the need to take the remediation classes of English and Math, as shown in the following table:

| <i>Subtest Component for Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification</i> | | <i>BSIE</i> |
|---|----------------------------------|---------------------------------------|
| Mathematics | Science/ Technical/General Track | At least 70% or C |
| | Commercial Track | At least 80% Or B |
| | Literature and Islamic Tracks | All must undergo remedial mathematics |
| Science | - | 60 |
| English | - | At least 80 or B |

*This is applicable to Bahraini and similarly equivalent qualification

5. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program.

| <i>Subtest Component for Other Qualification (Indian, Pakistan, and West African)</i> | | <i>BSIE</i> |
|---|----------------------------------|---------------------------------------|
| Mathematics | Science/ Technical/General Track | At least 51 or C1 |
| | Commercial Track | At least 71 or B1 |
| | Literature and Islamic Tracks | All must undergo remedial mathematics |
| Science | - | 60 |
| English | - | At least 71 or B1 |

*Note: Science component is subject to the evaluation of the Dean.

For the undergraduate applicant who did not meet the minimum required secondary school grades in



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Mathematics and English or its equivalent, his/her admissions depend on the following criteria:

| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|----------------|---|----------------------------------|---|
| All Programmes | 60-79 % grade in English | Score \geq 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| BSIE | For Scientific, General, and technical Track: Score 50-69% in Math | N/A | Foundation Course in Math |
| | Literature and Islamic Tracks | N/A | Foundation Course in Math |
| | Commercial Track: Score 50-79% | N/A | Foundation Course in Math |
| All Programmes | CGPA <60% for Bahraini and KSA CGPA <41% for Indian and Pakistan | N/A | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

a. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

b. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program (English Foundation).

c. IELTS/TOEFL

Applicants who submit official IELTS or TOEFL certificates issued by accredited examination centers, with a minimum score of 450 on the TOEFL (paper-based), 131 on the TOEFL (computer-based), or 5.0 on the IELTS, are exempted from taking the required English Placement Test.

In addition, applicants who obtain an IELTS score of 5.5 or higher or a TOEFL score that meets the equivalent standard may qualify for English course exemptions based on their results. This policy



recognizes academic achievement by allowing eligible students to be exempted from enrolling in introductory English courses upon admission.

| IELTS/TOEFL Scores | Exemption |
|--|---|
| Qualified applicants with 5.5 IELTS scores or TOEFL: 496 (paper-based) or 169 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 (English Communication Skills 1) |
| Qualified applicants with 6.0 IELTS scores or TOEFL: 546 (paper-based) or 211 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 and ENGL402/ENGL621 (English Communication Skills 1 and 2) |

d. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature and Islamic tracks must take the remediation course in Math.

e. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

B. For Undergraduate Transfer Student Applicants

Application Requirements:

37. Completely filled out an admission application form
38. Official Transcript of Records (TOR) from the university previously attended. Rules and regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school certificates are to be applied when necessary.
39. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
40. Certificate of Transfer from the university previously attended stamped by MOE, if any.

41. Withdrawal Certificate stamped by MOE

42. Submission of all required documents stated in the admissions policy.

Admissions Requirements:

- 19.** For Bahrain and KSA qualifications, the applicant should have at least a secondary school average of 60%. For non-Bahrain secondary qualifications (Indian and Pakistan) the applicant should have at least 41% secondary school average; and for other non-Bahraini qualifications please refer to the table of cut-off.
- 20.** If the applicant has taken and passed courses in English and Mathematics in the previous university, the applicant will be exempted in taking the remedial courses in both English and Mathematics. The applicant may proceed to mainstream university courses and is eligible to apply for credit transfer.
- 21.** If the applicant has not taken any course in English and Mathematics, the basis for evaluation whether remedial course in English and mathematics is required or not is the subject scores in his/her last year in the secondary school certificate using the table presented earlier.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. Practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or re-admitted student from UTB.

The University requires the undergraduate student to complete at least 50% of the required credit units/hours of a programme in residence at UTB. The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit units/hours based on his/her original degree from another university.

16. CGPA Requirement for Graduation

The required CGPA for an undergraduate student to be eligible for graduation is 2.0 out of 4.

17. Career Pathways

The BSIE graduates can pursue a career as network engineer, control engineer, network analyst/administrator, production engineer, systems developer, computer/software engineer, sales engineer, technical instructor/trainer. In addition, the programme can lead graduates for postgraduate degrees in engineering.

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| Year/ Level | Course Code | Course Title | Core (C) or Option (E) | Programme Learning Outcomes | | | | | | |
|-----------------------------------|----------------|-----------------------------------|---------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----|
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| Year 1 1st Tri | ARAB600 | Arabic Language | (C) | | | | ✓ | | | |
| | CHEM611 | General Chemistry | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| | IENF611 | Introduction to Computing | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | ENGL611 | English Communication Skills 1 | (C) | | | ✓ | | | | |
| | EUTH500 | Euthenics | (C) | | | | | | | |
| | MATH631 | Calculus 1 | (C) | ✓ | | | | | | |
| Year 1 2nd Tri | IENF621 | Computer Programming | (C) | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | ENGL621 | English Communication Skills 2 | (C) | | | ✓ | | | | |
| | HIST600 | History of Bahrain and GCC Region | (C) | | | | ✓ | | | |
| | MATH711 | Calculus 2 | (C) | ✓ | | | | | | |
| | HUMR600 | Human Rights | (C) | | | | ✓ | | | |
| Year 1 3rd Tri | IENF631 | Advanced Programming | (C) | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | ENGL631 | Speech and Oral Communication | (C) | | | ✓ | | | | |
| | SCIE631 | Biology | (C) | ✓ | | | | ✓ | ✓ | |
| | MATH621 | Probability and Statistics | (C) | ✓ | | | | | | |
| | PHYS631 | University Physics 1 | (C) | ✓ | | | | ✓ | ✓ | |
| | ENVS711 | Environmental Science | (C) | | | | ✓ | | | ✓ |
| Year 2 1st Tri | MATH722 | Advanced Mathematics | (C) | ✓ | | | | | ✓ | ✓ |
| | ENGL711 | Technical Writing | (C) | | | ✓ | | | | |
| | ENGG711 | Engineering Drawing | (C) | ✓ | | | | | | |
| | MATH622 | Discrete Mathematics | (C) | ✓ | | | | | ✓ | ✓ |
| | IENF711 | Data Structures & Algorithm | (C) | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | PHYS711 | University Physics 2 | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| Year 2 | IENF721 | Principles of Communications | (C) | ✓ | ✓ | | | ✓ | ✓ | |

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| 18. | BSIE CURRICULUM SKILLS MAPPING | | | | | | | | | |
|-----------------------------------|--------------------------------|--|---------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Option (E) | Programme Learning Outcomes | | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| 2nd Tri | ENGG721 | Electric Circuit Theory 1 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| | MATH731 | Multivariate Calculus | (C) | ✓ | | | | | ✓ | ✓ |
| | IENF723 | Introduction to Data Science | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF722 | Database Systems | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | PHYS722 | University Physics 3 | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| Year 2 3rd Tri | ENGG731 | Electronics 1 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| | ENGG734 | Signals and Systems | (C) | | | | | ✓ | ✓ | |
| | ENGG732 | Electric Circuit Theory 2 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | ENGG733 | Engineering Economy | (C) | ✓ | | | ✓ | | | |
| | MATH733 | Linear Algebra | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| | MATH732 | Numerical Methods and Analysis | (C) | ✓ | | | | | ✓ | ✓ |
| Year 3 1st Tri | ENGG813 | Digital Logic Design | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | IENF811 | Computer Networks 1 | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | ENGG812 | Electronics 2 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | IENF812 | Artificial Intelligence | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | ENGG811 | Electromagnetics | (C) | ✓ | | | | | | ✓ |
| | MATH821 | Optimization Methods | (C) | ✓ | | | | | | |
| Year 3 2nd Tri | IENF821 | Computer Networks 2 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| | IENF822 | Advanced Digital Logic Design | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | ENGG831 | Engineering Project Management | (C) | ✓ | | | ✓ | ✓ | | |
| | ENGG821 | Control Systems | (C) | ✓ | ✓ | | | | ✓ | ✓ |
| | IENF823 | Computer Organization and Architecture | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | IENF824 | Power Electronics | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Year 3 3rd Tri | IENF831 | Computer Networks 3 | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | ENGG842 | Safety Engineering | (C) | | | | ✓ | | | |
| | IENF832 | Operating Systems | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF833 | Machine Vision | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |

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| 18. | BSIE CURRICULUM SKILLS MAPPING | | | | | | | | | |
|-------------------------|--------------------------------|--|---------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Option (E) | Programme Learning Outcomes | | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| | IENF834 | Systems Analysis and Design | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF835 | Cloud Computing | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| Year 4 1st Tri | IENF841 | Digital Systems Design using HDL | (C) | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | IENF842 | Wireless Communication Systems | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | ENGG841 | Technopreneurship | (C) | | | ✓ | ✓ | ✓ | ✓ | |
| | IENF843 | Enterprise Networking | (C) | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| | IENF844 | Microcontroller and Embedded Systems | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | ENGG851 | Professional Ethics and Engineering Laws | (C) | | | | ✓ | | | |
| Year 4 2nd Tri | IENF856 | Robot Kinematics, Dynamics and Control | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | IENF852A | Cryptographic Systems | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF852B | Network Security | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF852C | Ethical Hacking | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF853A | Microprocessor Systems | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF853B | Data Mining | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF853C | Parallel and Distributed Computing | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF854A | Special Topics in Computer Engineering | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF854B | Digital Control Systems | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF854C | Industrial Control Systems Design | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF851 | Software Engineering | (C) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | IENF855 | Informatics Engineering Design Project A | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Year | IENF861 | Industrial Attachment | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |

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| 18. | BSIE CURRICULUM SKILLS MAPPING | | | | | | | | | |
|--------------------------|--------------------------------|--|---------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----|
| Year/ Level | Course Code | Course Title | Core (C) or Option (E) | Programme Learning Outcomes | | | | | | |
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| 4 3rd Tri | IENF862 | Informatics Engineering Design Project B | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

BACHELOROF SCIENCE IN INFORMATICS ENGINEERING (BSIE)

CURRICULUM PLAN EFFECTIVE AY 2022-2023

COURSES DESCRIPTION

FOUNDATION COURSES

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|---|---------------------------|------------|------------|-----------------|------------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| This course is a foundation in mathematics focusing on the building of the knowledge and skills and understanding to solve problems in college algebra and trigonometry. It deals with the topics on equations and Inequalities; functions and graphs; polynomial and rational Functions; exponential and logarithmic functions; trigonometric functions; trigonometric identities and equations; application of trigonometry; systems of equations and inequalities; and matrices. It also includes the application of the mathematical thinking process. | | | | | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| ENGL500 is a required foundation course for entering students whose English language skills need further improvement and enhancement to be able to cope with the university's academic courses. This course introduces the students to the English language where they get involved and engaged in the learning process. It utilizes an integrated approach in developing the students' English macro communication skills in speaking, listening, grammar, and vocabulary in one phase (preintermediate) which will serve as the benchmark for the next level first year English course. Furthermore, the course intensifies its intended learning objectives with the comprehensive utilization of audio-lingual presentations, includes information related to dictionary use, basic grammar rules, daily use vocabulary words through a variety of contexts, written responses, writing structures, settings of writing, and the process of forming written and spoken communications. Hence, the students are expected to gain more knowledge to communicate effectively in English. | | | | | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|--------------------------------|------------|------------|-----------------|-----------------|
| ARAB600 | Arabic Language | 3 | 0 | 3 | |
| <p>يركز مقرر ARAB600 على دراسة أساسيات اللغة العربية كقراءة وتحليل و نقد وبيان خصائص النصوص المطلوبة التي تتناول مختلف الأجناس الأدبية نثرا وشعرا. كما يركز هذا المقرر على دراسة وفهم وتطبيق القواعد النحوية والأساليب الصرفية الأساسية في اللغة العربية مع مراعاة مهارات الكتابة الإملائية الصحيحة.</p> <p>The course focuses on the fundamentals of Arabic language, such as reading, analyzing, and critique. It explains the characteristics of the required texts, which deal with different literary genres, prose and poetry. The course also focuses on the understanding and application of grammatical rules and basic morphological methods in Arabic, taking into account the correct spelling skills.</p> | | | | | |
| CHEM611 | General Chemistry | 2 | 2 | 3 | |
| <p>This course demonstrates atomic theories, relationships between structure and properties of matter, scientific notation, density calculation, atomic structure and energy levels, periodic table, ions formation and chemical bonding, chemical reactions and emphasizing the chemical change, balancing equation, Discussion on gas law includes properties and application of gas laws, Acids and bases, solution and clarification of acid – base concept.</p> | | | | | |
| IENF611 | Introduction to Computing | 2 | 2 | 3 | |
| <p>This course covers a detailed knowledge and understanding of computer hardware and software. It includes the discussion of number systems, networking and the internet and the interdisciplinary science of computing. It also provides a discussion of programme development structures, algorithms and flowchart development. The laboratory delivers practices in Microsoft 365 Apps, configuring web browsers security, configuring E-mail security, configuring OS security.</p> | | | | | |
| ENGL611 | English Communication Skills 1 | 3 | 0 | 3 | |
| <p>This is an introductory course in English communication designed to provide comprehensive, up-to-date and relevant instruction in the correct use of grammar. It intends to build up students' confidence in communicating their thoughts, ideas, information and messages through the functions and structures of different words, phrases, clauses, sentences and paragraphs. In addition, the integration of language skills increases their communicative competence and prepares them for the academic and social challenges in college and beyond.</p> | | | | | |
| EUTH500 | Euthenics | 1 | 0 | 0 | |
| <p>This course is designed to bring in the policies and procedures in the university, to guide the students in the performance of their respective role and to become adept on ideals needed in their academic pursuit. Thus, students are oriented on the history, vision, mission, values and objectives of the university, the services and academic support available, the academic and non-academic policies, the different misconduct and violations with corresponding penalties in which the learning objectives are better facilitated by various classroom discussion through collaborative teamwork learning experience.</p> | | | | | |

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|--|------------|---|---|-----------|--|
| MATH631 | Calculus 1 | 5 | 0 | 5 | |
| This course is intended to develop practical skills in differential calculus and analytic geometry. Emphasis is placed on functions, limits and continuity, fundamental concepts of analytic geometry, explicit and implicit differentiation of algebraic and transcendental functions, conics, higher derivatives, polar coordinates and its applications (equations of tangent and normal lines, sketching polynomial curves, maxima and minima problems and time rates. | | | | | |
| TOTAL | | | | 17 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|-----------------------------------|---------|---------|--------------|-----------------|
| IENF621 | Computer Programming | 2 | 2 | 3 | IENF611 |
| This course covers detailed knowledge in problem solving and algorithm development, with emphases on developing good programming habits, and programming in a modern computer language. The course familiarizes the students with the features of object-oriented programming and its applications to solve the problems. It includes a discussion of an overview of the Java language syntax, including packages, classes, methods, variables, conditional statements, control flow and Arrays. The laboratory focuses on the implementation of the programming theories and concepts in Java programming language. | | | | | |
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
| This is an intermediate course in English communication geared towards equipping the college students with writing skills in preparation for academic writing. It progresses from familiarizing the sentence conventions to balancing the structures of the sentence for variation and rhythm. Further, it enables students to follow the principles that govern the composition writing in achieving unity, coherence, and emphasis; to improve their expository, descriptive, narrative, and argumentative works and to get hold of the discipline in academic writing for future advantages by providing them the opportunity in adhering the process of writing for effective communication. | | | | | |
| HIST600 | History of Bahrain and GCC Region | 3 | 0 | 3 | |
| يتناول المقرر HIST600 دراسة تاريخ مملكة البحرين ومنطقة الخليج العربي ويظهر تعداد للاحداث الهامة في البحرين ومنطقة الخليج العربي وأثارها على الوضع الراهن ، و يغطي الأهمية الاستراتيجية والمكانية للبحرين للبحرين بدءاً من الحضارات القديمة و مروراً إلى العهد الاسلامي، والاحتلال البرتغالي، وصراع القوى في القرن السابع عشر، وصعود قبيلة العتوب، والبحرين تحت الحماية البريطانية وابرام المعاهدات مع بريطانيا، وانسحاب القوات البريطانية من البحرين والخليج ، ويتناول وصف الاماكن والشخصيات والتطورات التاريخية والانجازات في البحرين في عهد حكام البحرين، والبعث العربي والاسلامي في تكوين هوية البحرين ، ألانضمام لمجلس التعاون الخليجي ، وتاريخ دول الخليج العربي (دول مجلس التعاون الخليجي)، ومع نهاية الكورس يكون الطالب قادر على تحليل الجذور التاريخية للبحرين لتكوين الهوية الوطنية ، والتمتع بمقدرة الاتصال الشفهي والكتابي والعمل بشكل منتج وفعال ضمن فريق واحد. | | | | | |
| This Course includes the history of the Kingdom of Bahrain and the Arabian Gulf region. It includes the important events in Bahrain and the Arabian Gulf region and their impact on the current situation. It covers the strategic importance of Bahrain, starting with "Ancient civilizations and passing through" the Islamic era, Bahrain's entry into Islam, Portuguese occupation, competition of powers in the 17 th century and the rise of a tribe of Al-Atub. It includes the history of Bahrain under the British protection and the conventions between Bahrain and Great Britain up to British troops leaving the region. It describes the places and persons as well | | | | | |

as the historical developments and achievement in Bahrain during the time of Al- Khalifah. It includes independence of Bahrain, issuing of the first constitutional law, reform project by His Majesty King Hamad, constitutional amendments, establishment of GCC, history of Arab Gulf states. It makes the student able to present his patriotic character through historical discussions.

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|---------|------------|---|---|---|---------|
| MATH711 | Calculus 2 | 5 | 0 | 5 | MATH631 |
|---------|------------|---|---|---|---------|

This course provides the students with knowledge and understanding of core concepts, theories and principles in evaluating definite and indefinite integrals and its applications in solving engineering and computing problems. The course also covers solutions to ordinary differential equations which can be used in modeling important applications in the scientific and engineering fields.

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|---------|--------------|---|---|---|--|
| HUMR600 | Human Rights | 3 | 0 | 3 | |
|---------|--------------|---|---|---|--|

تناول هذا المقرر تمكين الطالب و جعله قادرا على معرفة الخلفية التاريخية لحقوق الإنسان، المفاهيم و الاصول الفلسفية و الرؤيا الاسلامية لحقوق الانسان كما يتناول بالعرض و التحليل مصادر حقوق الإنسان كالإعلان العالمي لحقوق الإنسان، و العهد الدولي الخاص بالحقوق المدنية و السياسية و العهد الدولي الخاص بالحقوق الاقتصادية و الإجتماعية و الثقافية و الوثائق الدولية الأخرى ذات الصلة بحقوق الإنسان ماورد فيها من الحقوق و التمييز بينها. كما يتناول بالمقارنة ذاتها ما ورد في الوثائق الوطنية مثل دستور مملكة البحرين و الميثاق الوطني و كيفية تطبيقها. و يُمكن الطلبة من مهارات تحليل و تفسير و نقد التطبيقات و التجاوزات فضلا عن القدرة على التحليل و التواصل و عرض مسائل حقوق الإنسان بمختلف الوسائل.

This course makes the students able to know the background, main concepts of Human Rights and the philosophical thoughts and Islamic view which contribute in modern Human Rights. It makes them able to analyze what is mentioned in different kinds of Human Rights sources as Universal Declaration of Human Rights, International Covenant on Civil and Political Rights and International Covenant on Economic, Social and Cultural Rights. It deals in the same approach with the National Sources of Human Rights such as the Constitutional Law of Kingdom of Bahrain and National Action Charter with applications as well. The course makes the students able to analyze, discuss and debate Human Rights issues in different ways.

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| TOTAL | 17 |
|--------------|-----------|

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|----------------------|---------|---------|--------------|-----------------|
| IENF631 | Advanced Programming | 2 | 2 | 3 | IENF621 |

This course covers object-oriented techniques using modern fourth generation language. Topics include inheritance, method overloading, overriding, polymorphism, packages, exception handling, multithreading, file operations and Event driven programming using swing components. The laboratory focuses on the implementation of programming theories and concepts in Java programming language.

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|---------|-------------------------------|---|---|---|---------|
| ENGL631 | Speech and Oral Communication | 2 | 2 | 3 | ENGL621 |
|---------|-------------------------------|---|---|---|---------|

This is a developmental course in English communication geared towards competent, efficient, and effective interpersonal speaking across communicative contexts. It refines oral communication skills through accurate articulation of segmental phonemes, pronunciation drills, and enunciation of the suprasegmental features of speech, specifically sentential stress, and intonation. Further, it incorporates the mechanics and techniques of speech craft and delivery with emphases on practical speaking experiences and analysis of audience psychology, which are deemed applicable in diverse speech situations.

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|--|----------------------------|---|---|-----------|---------|
| SCIE631 | Biology | 2 | 2 | 3 | |
| This course focuses on the detailed knowledge and understanding of the fundamental life processes and functions of living systems including the nature of knowledge relating to cell structure, function and metabolism, bioenergetics, genetics and biotechnology, cellular reproduction and cell division, evolution, biodiversity, and ecology. The students will demonstrate the importance of explanations based on evidence through inquiry-based laboratory activities to provide insight into scientific method. | | | | | |
| MATH621 | Probability and Statistics | 3 | 0 | 3 | |
| This course provides a demonstration of the main concepts of probability and statistics with applications. It also covers identifying the theorem of probability and linked with real life problems. How to differentiate between the combination and permutation, explain how to find the mean and variance from the moment generating function. Explain and interpret the findings from different hypothesis tests for decision making. Finally, SPSS will be used to run the statistical measures (e.g. hypothesis tests and regression model) | | | | | |
| PHYS631 | University Physics 1 | 2 | 2 | 3 | MATH631 |
| This course is designed to explore the concepts of motion using vectors and other mathematical models and their advanced application, such as the application of Newton's laws of motion, projectile motion, work, energy, momentum and impulse, rotational dynamics, equilibrium of a rigid body, and periodic motion. | | | | | |
| ENVS711 | Environmental Science | 3 | 0 | 3 | |
| This course is an introduction to Environmental Science focusing on interrelationships of the natural world, sustainable development with environmental, economic and societal dimensions, energy transformations, ecological process and relationships, energy flow through systems, human population growth, water processes and cycles, impacts of climate change, "green" electronic processes, energy utilization and efficiency, conventional and alternative energy sources, present day agricultural practices, biodiversity and threats by human activity, and conservation issues. | | | | | |
| TOTAL | | | | 18 | |

SECOND YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|-------------------------------|---------|---------|--------------|-----------------|
| IENF711 | Data Structures and Algorithm | 2 | 2 | 3 | IENF631 |
| This course covers advanced problem solving in linear and non-linear data structures and their implementation. Topics include arrays, sorting and searching techniques, stacks, queues, linked lists, trees and hash tables. In addition, it covers various strategies for choosing appropriate structures according to the system requirements. The laboratory portion covers the implementation of linear data structures such as stacks and queues and nonlinear data structures like trees and graphs using array and linked list. | | | | | |
| ENGL711 | Technical Writing | 3 | 0 | 3 | ENGL621 |
| This is an advanced course in English academic writing designed to deal with the application of the technical writing principles with the correspondence on business, science, and technology. It aims to develop the | | | | | |

technical writing skills and communication of the college students thru the discussions of its elements and ethics with the use of digital technologies. Furthermore, it enables students to adapt the various communication routes in the workplace, to conceptualize suitable contents of technical writing, to understand the characteristics and other methods of communication techniques, to plan and organize advanced level tasks and to work effectively and with accountability with other team members in a creative and productive manner, in any language learning scenario when achieving personal and group outcomes.

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|---------|---------------------|---|---|---|--|
| ENGG711 | Engineering Drawing | 2 | 2 | 3 | |
|---------|---------------------|---|---|---|--|

This course deals with the application of Computer-Aided Drafting Design (CADD) in sketching and drawing to produce engineering drawings. The student will learn the appropriate AutoCAD drawing and modifying commands to generate 2D drawings and orthogonal projections of 3D drawings. The course will cover editing, modifying and plotting 2D and 3D drawings.

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|---------|----------------------|---|---|---|---------|
| MATH722 | Advanced Mathematics | 3 | 0 | 3 | MATH711 |
|---------|----------------------|---|---|---|---------|

This course deals with the study of complex numbers, series solutions of ordinary differential equations by power series, Bessel Function, Frobenius method. Basics of Fourier series, Fourier transform, Laplace and inverse Laplace Transforms. Using MATLAB or other mathematical software in order to solve mathematical problems.

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|---------|----------------------|---|---|---|---------|
| MATH622 | Discrete Mathematics | 3 | 0 | 3 | MATH631 |
|---------|----------------------|---|---|---|---------|

This course introduces fundamental concepts and techniques in set theory in preparation for its many applications in Informatics Engineering. Topics include logic, proofs, sets, relations, functions, graphs and trees. It simplifies and evaluates basic logic statements including compound statements, implications, inverses, converses, and contrapositives using truth tables and the properties of logic.

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|---------|----------------------|---|---|---|---------------------|
| PHYS711 | University Physics 2 | 2 | 2 | 3 | PHYS631, MATH711 |
|---------|----------------------|---|---|---|---------------------|

This course is designed to explore the concepts of electricity and magnetism using the concepts of mechanics, vectors, and other mathematical models and their advanced application, such as application of Coulomb's law, Gauss's law, Ohm's law, Kirchhoff's laws, electric potential and potential difference, basic circuits, series and parallel circuits and combinations, magnetic field and flux, induced EMF and applications such as electric motors and basic AC electric generators.

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| TOTAL | 18 |
|--------------|-----------|

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|------------------------------|------------|------------|-----------------|-----------------|
| ENGG721 | Electric Circuit Theory 1 | 2 | 2 | 3 | PHYS711 |
| The course deals with the study of core theories, principles and concepts for analysis of DC networks through the application of basic laws and network theorems. It covers the inter relationship between the parameters of DC circuits, critical analysis of complex circuits excited by DC voltages and current sources through basic circuit laws - KVL and KCL and structured methods and theorems like nodal analysis, Mesh analysis, superposition, Maximum power transfer & Millman's theorem. | | | | | |
| IENF721 | Principles of Communications | 2 | 2 | 3 | PHYS631 |

The course deals with the This course deals on review on signals and systems, Introduction to communications systems. Amplitude modulation techniques (AM-LC, DSBSC, SSB, VSB and FDM). Frequency modulation techniques (NBFM, WBFM). Sampling, PCM, Pulse Modulation (PAM, PCM, TDM). Introduction to digital communication and digital modulations (MSK, FSK, PSK, etc).

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|---------|------------------|---|---|---|---------|
| IENF722 | Database Systems | 2 | 2 | 3 | IENF711 |
|---------|------------------|---|---|---|---------|

This course provides advanced core theories and practical skills in databases and database management systems with information technology applications. The theoretical knowledge covers Database Environment, Relational Model, Database Operations, Structured Query Language, Entity Relationship Model and Normalization. It exposes the student to the advanced concepts and techniques in database development as well provides a foundation for research in databases.

The laboratory practices the Data Definition Language (DDL) Commands, Data Manipulation Language (DML) Commands, Data Query Language(DQL) Commands, Transaction Control Language(TCL) Commands, SQL Built-in Functions, Constraints, Joins, Group By Command, Subqueries and Database Objects using Oracle SQL Developer tool.

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|---------|------------------------------|---|---|---|---------|
| IENF723 | Introduction to Data Science | 2 | 2 | 3 | IENF711 |
|---------|------------------------------|---|---|---|---------|

This course utilizes several open-source tools to address big data challenges, taking an "Open" or technology-neutral approach. It covers concepts, and techniques needed to deal with various aspects of data science practice, including data collection, cleansing, mangling, and integration, exploratory data analysis, predictive modeling, descriptive modeling, data product creation, machine learning algorithms, evaluation, effective communication and Data Visualization.

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|---------|-----------------------|---|---|---|---------|
| MATH731 | Multivariate Calculus | 2 | 2 | 3 | MATH711 |
|---------|-----------------------|---|---|---|---------|

This is the third part of the course in calculus focused on vector and multi-variable calculus. Topics associated with the course demonstrate advanced knowledge and understanding of the following: vectors and vector operators, calculus of functions of several variables including partial differentiation and multiple integrals, Lagrange multipliers, applications of partial differentiation, line integrals, Green's theorem, Stoke's theorem, and Divergence theorem. The course also includes laboratory components that make use of MATLAB as tool in solving problems in Multivariate Calculus.

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|---------|----------------------|---|---|---|---------|
| PHYS722 | University Physics 3 | 2 | 2 | 3 | PHYS711 |
|---------|----------------------|---|---|---|---------|

This course is designed to explore the concepts of heat and thermodynamics, waves and optics, relativity, molecular, atomic, and nuclear physics using the concepts of mechanics, electricity and magnetism, vectors, and other mathematical models and their advanced application, such as the application of the laws of thermodynamics, light and electromagnetic waves, Einstein's special theory of relativity, Planck's Quantum theory, de Broglie's waves, Heisenberg's Uncertainty Principle, Dirac's electron theory, Hund's Rule, and atomic models from Thompson's to Quantum Mechanical, as well as nuclear models.

TOTAL**18**

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|--------------------------------|------------|------------|-----------------|-----------------|
| ENGG734 | Signals and Systems | 2 | 2 | 3 | ENGG721 |
| This course covers the study of the core topics, principles of signal and noise, modulation and demodulation. It also discusses the specialist theories and principles of application of signals in the field of amplitude modulation and frequency modulation covering modulation index, bandwidth, side frequencies, power distribution and calculation, modulator circuits. Moreover, spectral analysis, bandwidth ,efficiency, various transforms and filters will also be covered. | | | | | |
| ENGG733 | Engineering Economy | 3 | 0 | 3 | MATH621 |
| This course deals with the advanced study of the core theories, principles and concepts of economic environment, interest and money-time relationship, depreciation, capital financing, comparing alternatives, replacement studies, break-even analysis, benefit cost ratio, and benefit cost difference. It presents mathematical techniques and practical advice for evaluating decisions in the design and operation of engineering systems. | | | | | |
| ENGG731 | Electronics 1 | 2 | 2 | 3 | ENGG721 |
| This course discusses core theories, principles and concepts of semiconductors, PN junction diode, other types of diodes & bipolar junction transistor (BJT). It also relates to fundamental diode circuit's application and design; rectifiers, limiters, doublers, Zener diode characteristics and applications, and special purpose diodes. The course evaluates the operation of bipolar junction transistor (BJT), and its characteristic and parameters; BJT as amplifier and switch, DC analysis and different biasing methods. | | | | | |
| ENGG732 | Electric Circuit Theory 2 | 2 | 2 | 3 | ENGG721 |
| This course deals with core theories, principles and concepts of the topics of sinusoidal voltage and current on RLC circuits, vector algebra and its application to AC circuit analysis, sinusoidal and non- sinusoidal single phase system, and three phase systems. It also covers reactance, impedance, resonance, power in AC circuits, power factor correction and impedance network. The course evaluates the theorems which includes Kirchhoff's laws, Mesh, Superposition, Nodal Analysis, Thevenin's, Norton, and Maximum power transfer. | | | | | |
| MATH732 | Numerical Methods and Analysis | 2 | 2 | 3 | MATH722 |
| This course demonstrates critical knowledge and understanding of specialist theories, principles and concepts of the study of numerical approximations and errors, numerical solutions of non-linear equations, interpolation and curve fittings, numerical differentiation and integration. The course also covers analysis of accuracy of numerical differentiation and integration methods and solution of initial value problems using Euler Method. Analysis of accuracy of Euler's method. The course also includes laboratory components that make use of MATLAB as tool in solving problems in Numerical Analysis. | | | | | |
| MATH733 | Linear Algebra | 2 | 2 | 3 | MATH731 |
| This course use specialist level skills to relate to and adapt main and core theories and concepts in the study of matrices and determinants, and their applications in numerical solutions of systems of linear equations. It also includes important topics such as linear transformations, eigenvalues and eigenvectors, complex vectors and matrices and numerical linear algebra. In the laboratory, MATLAB is use as a mathematical software and solutions to a variety of mathematical problems are determined. | | | | | |

TOTAL**18****THIRD YEAR****FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|-------------------------|----------------|----------------|---------------------|------------------------|
| ENGG813 | Digital Logic Design | 2 | 2 | 3 | ENGG731 |
| This course provides critical knowledge and understanding of designing digital logic circuits. It covers number systems and conversion, Boolean algebra, algebraic manipulation, applications of Boolean algebra, Karnaugh maps, multi-level gate circuits, multiplexers, decoders, comparators, latches and flip-flops, registers, counters and introduction to HDL. Through laboratory and in-course project, the students will creatively implement complex applications of digital logic circuits. | | | | | |
| IENF811 | Computer Networks 1 | 2 | 2 | 3 | IENF721 |
| This course integrates the core theories, principles, concepts, structure, functions and components of the Internet and computer networks. The OSI and TCP/IP models are used to examine the services and the associated protocols in each layer. The concepts and structure of IPv4 addressing and subnetting, its application, operation and implementation to networks are discussed. The laboratory part makes use of a range of approaches including the Packet Tracer and GNS3 to allow students to implement static routing and critically analyze network requirements, issues and/or problems. These simulators will allow the students to build networks, use appropriate devices and IP addresses, and perform configurations. | | | | | |
| ENGG812 | Electronics 2 | 2 | 2 | 3 | ENGG731 |
| This is an advanced course in electronics which deals with concept, analysis and design of electronic circuits using linear and integrated devices. In this course include AC and DC analysis, principles and concepts of frequency response of BJT amplifiers and further extends the study to multistage amplifier and various FET. The other topics include study and critical analysis of Operational Amplifier, its application, Feedback topologies & explore NE555 Timer and its applications. | | | | | |
| IENF812 | Artificial Intelligence | 2 | 2 | 3 | IENF723 |
| This course covers advanced theories and state-of-the-art techniques of artificial intelligence. Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on computers. The AI is to make a computer that can learn, plan, and solve problems autonomously. The topic includes building blocks and components of artificial intelligence, learning about concepts like algorithms, machine learning, and neural networks. The laboratory focuses on training the students with building models using various artificial intelligence algorithms. | | | | | |
| ENGG811 | Electromagnetics | 3 | 0 | 3 | ENGG732 |
| This course covers core topics on electric and magnetic fields that emphasize fundamental concepts and applications in electromagnetic. Topics include vector analysis, coulomb's law and electrical field intensity, electric flux density, gauss's law, magnetic flux, magnetic flux density, magnetic potential, time varying fields, concepts and applications of Maxwell equations, electromagnetic waves and propagation, plane waves and reflection, waveguides, and Antennas. | | | | | |
| MATH821 | Optimization Methods | 3 | 0 | 3 | MATH732 |

The course takes a unified view of optimization and covers the main areas of application of core optimization algorithms. The topics include linear optimization, robust optimization, network flows, dynamic optimization and non-linear optimization.

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|--------------|-----------|
| TOTAL | 18 |
|--------------|-----------|

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|--|---------|---------|--------------|-----------------|
| IENF821 | Computer Networks 2 | 2 | 2 | 3 | IENF811 |
| This course provides an in-depth and advanced discussion of routing technology. It integrates the core theories, concepts, functions and operations of a router including the principles and applications of routing protocols. Topics include router components and configuration; Unicast and Multicast routing protocols: RIPv1, RIPv2, EIGRP, OSPF and BGP; VLSM and IPv6. The students make use of a range of approaches including the Packet Tracer, GNS3 and the actual network devices in the laboratory in performing advanced and complex network configurations using the different routing protocols and in the critical analysis of network requirements, issues and/or problems. | | | | | |
| IENF822 | Advanced Digital Logic Design | 2 | 2 | 3 | ENGG813 |
| This course provides critical knowledge and understanding of analysis and design of synchronous and asynchronous sequential circuits based on core theories, principles and concepts of combinational circuit and Hardware Description Language(HDL) Topics covered include design of Decimal Adder, Binary multiplier, multiplexer ,Demultiplexer, encoder ,decoder, design of sequential circuits like registers and counters, HDL models for combinational and sequential circuits , combinational PLDs and introduction to FPGA . | | | | | |
| IENF823 | Computer Organization and Architecture | 2 | 2 | 3 | ENGG813 |
| This course covers computer arithmetic, computer function, components and their interconnections. It also includes discussion on memory hierarchy and organization; I/O peripherals and interfacing; instruction sets based on 8086 microprocessor, addressing modes and access; processor structure and functions including interrupts, RISC and CISC. The laboratory uses Assembly Language Program software which is a microprocessor emulator with editor, assembler and debugger. | | | | | |
| IENF824 | Power Electronics | 2 | 2 | 3 | ENGG812 |
| This course covers the power electronics semiconductor switches, Thyristor, Triac, GTO and advanced types of power transistor. Triggering devices: UJT, DIAC, and PUT. Types of power conversion: single phase and three phase uncontrolled and controlled rectifiers and their performance. AC voltage regulator, inverters single phase and three phase with PWM techniques. | | | | | |
| ENGG821 | Control Systems | 2 | 2 | 3 | ENGG734 |
| The course deals with the study of the concepts of control systems. It covers also the discussion of the mechanical and electrical modeling using conventional differential equations, reduction rules applied to block-diagram of linear control systems and signal flow graph. Laplace and Inverse Laplace Transformations. Discussion of time-domain response of first and second order control systems, steady-state errors, Routh-Hurwitz Criterion for stability, root locus method, frequency response (bode diagram and polar plot), Nyquist | | | | | |

stability criterion, and compensatory design techniques. MATLAB is used for analyzing and simulating control systems.

| | | | | | |
|---|------------------------------------|---|---|-----------|---------|
| ENGG831 | Engineering and Project Management | 3 | 0 | 3 | ENGG733 |
| This course provides critical knowledge and understanding of project management and the essential tools needed to deliver successful projects on time and on budget from the standpoint of the manager, who must skillfully organize, plan, implement and control non-routine activities to achieve schedule, budget and performance activities. Topics include: project life cycles, principles and concepts of strategic management process in project selection and organization, planning, budgeting and scheduling systems. It also covers planning and control methods such as PERT- CPM , Gantt Charts, earned value techniques, project audits, and risk management to critically evaluate various project management situations. | | | | | |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|-----------------------------|---------|---------|--------------|-----------------|
| IENF831 | Computer Networks 3 | 2 | 2 | 3 | IENF821 |
| This course provides critical knowledge and understanding of the theoretical and practical approaches about technologies and protocols in the design and implementation of switched networks. Students learn about advanced and complex hierarchical network design model. The course tackles switch functionalities and implementations using VLAN, VTP, STP, Inter-VLAN, Link- Aggregation Protocol and WLAN. The laboratory sessions provide practical and actual approaches to learning advanced and complex switch configurations and troubleshooting using the different protocols mentioned. | | | | | |
| IENF832 | Operating System | 2 | 2 | 3 | IENF722 |
| This course provides advanced and detailed information about the components and functionalities of operating systems. Topics include operating system structures, process management & scheduling, memory management, virtual memory management, deadlocks, file systems, directory structure, protection, security and distributed operating systems. In laboratory, the various operating system commands are illustrated using DOS, Cygwin tools and the implementation of scheduling, memory management and page replacement algorithms using Java. | | | | | |
| IENF833 | Machine Vision | 2 | 2 | 3 | IENF812 |
| This course discusses core theories, principles and concepts of machine vision devices and techniques and also learns about computer vision systems and digital image processing. It also relate to fundamental issues and techniques of computer vision and image processing. Emphasis will be on physical, mathematical, image-processing, pattern recognition, and feature extraction aspects of vision. The course will have a proper Lab activity to enable students to understand the breadth and depth of the lecturing materials. The main topics that will be as: Machine vision concepts, Image acquisition, Lighting, Image formation, Image conversion, Image processing and analysis. Image enhancement, Edge detection and Image segmentation. | | | | | |
| IENF834 | Systems Analysis and Design | 2 | 2 | 3 | IENF722 |
| The course describes the concepts and methods used in the analysis and design of computer-based | | | | | |

information systems. It includes discussions of typical computer systems life cycles, system requirements and specification, feasibility concerns, system design, fault tolerance, people and interface issues, compliance with ethical and legal standards and quality issues. The laboratory focuses on training the students with hands-on experience on using UML using various tools.

| | | | | | |
|---------|-----------------|---|---|---|---------|
| IENF835 | Cloud Computing | 2 | 2 | 3 | IENF821 |
|---------|-----------------|---|---|---|---------|

This course covers advanced concepts required to build a cloud infrastructure based on a cloud computing reference model. The reference model includes five fundamental layers, namely, physical, virtual, control, and service and three cross-layer functions, namely business continuity, security, and service management for building a Cloud infrastructure. Furthermore, Topics included Cloud infrastructure reference model, resource management, programming models, application models, system characterizations, and implementations, deployment of Cloud computing systems. Moreover, this course takes an open approach to describe concepts and technologies.

| | | | | | |
|---------|--------------------|---|---|---|---------|
| ENGG842 | Safety Engineering | 2 | 0 | 2 | IENF824 |
|---------|--------------------|---|---|---|---------|


This course deals with the detailed study of the principles of safety engineering and applications of safety principles to industrial and commercial systems. It covers topics concerning safety management, occupational health, fire prevention and control, electrical safety and environmental safety. Further, students will learn how to conduct risk analysis and some of the mitigation measures.

| | | | | | |
|--------------|--|--|--|-----------|--|
| TOTAL | | | | 17 | |
|--------------|--|--|--|-----------|--|

FOURTH YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|----------------------------------|---------|---------|--------------|-----------------|
| IENF841 | Digital Systems Design using HDL | 2 | 2 | 3 | IENF822 |
| This course covers topics in the advanced design and analysis of digital circuits with VHDL. The primary goal is to provide in depth understanding of logic and system design, synthesis, and optimization. The course enables students to apply their knowledge for the design of digital hardware systems with corresponding memory modules and reconfigurable programmable logic devices (PLDs and FPGAs). Verilog HDL will be used for simulation and synthesis of the lab exercises and final design project. | | | | | |
| IENF842 | Wireless Communication Systems | 2 | 2 | 3 | IENF821 |
| This course aims to develop the core knowledge of communications theories and their applications in digital communications. The course covers the structure of the digital communication systems, analog modulation technique, digital modulation techniques, probability of error in digital communication system, multiple access techniques, channels and source encoding, mobile communication systems. | | | | | |
| ENGG841 | Technopreneurship | 3 | 0 | 3 | ENGG831 |
| The course deals with the study of entrepreneurship in IT industry by applying the core theories and principles of entrepreneurship and management in IT business. The course covers types of entrepreneurship, legal factors related to the project like Business act, company act, technology act and Industrial act, developing a Business plan by integrating business proposal writing skill, software skills, innovation and | | | | | |

| | | |
|--|---------------------|-----------|
|  University of Technology Bahrain | Doc. No. | QR-AAD-01 |
| | Revision No. | 01 |
| | Date of Effectivity | 01-09-23 |
| College/Department: College of Engineering | | |
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creativity skills. It also covers advanced level topics like risk management, configuration management and quality management.

| | | | | | |
|--|--|---|---|-----------|---------|
| IENF843 | Enterprise Networking | 2 | 2 | 3 | IENF821 |
| This course provides critical knowledge and understanding of the theoretical and practical approaches to WAN technologies and network services required by converged applications in complex enterprise networks. Topics include Point-to-Point (PPP) concepts, Frame Relay, Access Control Lists (ACLs), Network Security and Monitoring, VPN technology, IP addressing services and Quality of Service. The laboratory sessions provide practical and actual approaches to learning advanced and complex implementation and configuration of WAN technologies and protocols as mentioned. | | | | | |
| IENF844 | Microcontroller and Embedded Systems | 2 | 2 | 3 | IENF823 |
| This course provides critical knowledge and understanding of microcontroller-based systems design, development and implementation. It includes embedded system types, microcontroller architecture, programming, digital and analog I/O interfacing, task scheduling, interrupt and timers management, and communication interfaces. Through laboratory and in-course project, the students will creatively implement complex applications of microcontroller-based systems. | | | | | |
| ENGG851 | Professional Ethics and Engineering Laws | 3 | 0 | 3 | ENGG831 |
| This course covers topics in the core theories and concepts of ethics, law, contracts, intellectual property, the responsible engineer, moral thinking, risk/safety/liability, employer responsibilities, product liability, and environmental responsibilities. The course deals with several case studies of ethical problems in engineering. It discusses the core concepts of environmental protection and sustainability to understand how they relate to engineering ethics. The course is intended to promote greater reflection by engineers on their activities to better understand the social dimensions of engineering practice. It also provides a historical perspective on society's environmental concerns, and discusses environmental statutes, our regulatory system, approaches to preventing and mitigating environmental problems, and the elements of an effective environmental management system. | | | | | |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|--|---------|---------|--------------|--------------------------|
| IENF851 | Software Engineering | 2 | 2 | 3 | IENF832 |
| This course demonstrates the advanced concepts in software design paradigms; identify software requirements and use Computer Aided Software Engineering in designing and developing efficient software application. The course covers an in-depth survey of software process, project management, project metrics, project scheduling, risk management, software testing and software quality assurance. The course also covers the implementation of the proposed system using structured programming, software reviews, software testing techniques and strategies, software maintenance. The laboratory focuses on providing students with hands-on experience using different tools to design a mini project such as Microsoft Visio, Visual Studio and others. | | | | | |
| IENF855 | Informatics Engineering Design Project A | 0 | 6 | 3 | Completion of 162 Credit |



| | | | | | Units |
|---|---|---|---|-----------|---------|
| <p>This is the first of two courses in Informatics Engineering Design sequence which prepares students for engineering practice through a culminating major design experience or capstone based on the knowledge and skills acquired in foundation and core courses and incorporating appropriate engineering standards (IEEE, ISO) as an integral part and with due consideration of multiple realistic constraints tradeoffs. This is a group supervised design project in which students analyze, specify, design, construct, evaluate and adapt physical computing in various applications such as in smart environments and embedded systems. They also incorporate design standards and make decision as a result of multiple design tradeoff/constraints (economics, environmental, social, political, ethical, health and safety, manufacturability, and sustainability) analysis and evaluation as part of the design process.</p> | | | | | |
| IENF852 | Major Elective 1 (Check below) / 3 Credit Units | | | | |
| IENF853 | Major Elective 2 (Check below) / 3 Credit Units | | | | |
| IENF854 | Major Elective 3 (Check below) / 3 Credit Units | | | | |
| IENF856 | Robot Kinematics, Dynamics and Control | 2 | 2 | 3 | ENGG821 |
| <p>This course facilitates the core learning and understanding of robot manipulators for students to understand complex design and applications of robots in industrial application. Successful completion allows students to formulate the kinematics and dynamic modelling of robotic manipulators consisting of a serial chain of rigid bodies and to implement control algorithms with sensory feedback during the lab sessions. Students will gain specialist skills in dealing with complex control architecture and manipulator structure typical to new-generation robots</p> | | | | | |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|--|---------|---------|--------------|-----------------|
| IENF861 | Industrial Attachment | 0 | 6 | 6 | IENF844 |
| <p>This course is the practicum course where the students are exposed to actual work environment. The students are required to complete 240 hours of on-site training. They are sent to work environments under the supervision of a practicum professor. Moreover, at the end of the course, an individual student submits a final report and a performance evaluation made by the on-site supervisor.</p> | | | | | |
| IENF862 | Informatics Engineering Design Project B | 0 | 6 | 3 | IENF855 |
| <p>This course is a continuation of Informatics Engineering Design A which enables students to design a system, component, or process to meet desired needs within realistic constraints through a culminating major design experience or capstone based on the knowledge and skills acquired in foundation and core courses and incorporating appropriate engineering standards (IEEE, ISO) as an integral part and with due consideration of multiple realistic constraints tradeoffs.</p> <p>This is a group supervised design project in which students analyze, specify, design, construct, evaluate and adapt physical computing applications in smart environments and embedded systems. They also incorporate design standards and make decisions as a result of multiple design tradeoff/constraints (economics,</p> | | | | | |

environmental, social, political, ethical, health and safety, manufacturability, and sustainability) analysis and evaluation as part of the design process.

TOTAL
9
Grand Total
204

ELECTIVE COURSES

MAJOR ELECTIVE 1 (Student must choose 1 course)

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|-----------------------|---------|---------|--------------|-----------------|
| IENF852A | Cryptographic Systems | 2 | 2 | 3 | IENF821 |
| This course emphasizes systematic authentication to follow the advancement of cryptographic techniques and security protocols. It exposes the various protocols and cryptographic functions to estimate the strength of security using advanced encryption/decryption algorithm. It also discusses security enhancement techniques such as symmetric and asymmetric encryption and key exchange management. In addition, it investigates the various complex security issues and develops a high-level security mechanism in contemporary networked computer systems. The laboratory portion implements the complex level conversion of plain text to cipher text using RSA algorithm, Diffie-Hellman-Key-Exchange algorithm and Stream Cipher Technique to embed security in Java. In addition, it identifies suitable cryptographic algorithms for a given problem to resolve security issues. | | | | | |
| IENF852B | Network Security | 2 | 2 | 3 | IENF821 |
| This course discusses the essentials and underlying of network security with emphasis on secure network administration principles. It includes compliance and operational security, threats and vulnerabilities, controls and protection methods, and encryption and authentication technologies in order to attain secured working environment. In laboratory part, Cisco networking simulation tools are used to simulate, configure and apply Cisco compatible authentication protocols on the simulated networks. | | | | | |
| IENF852C | Ethical Hacking | 2 | 2 | 3 | IENF821 |
| This course is designed to provide concepts and practices of cybersecurity with expert coverage of essential topics required for entry-level cybersecurity certifications. It covers the four distinct challenges: securing the infrastructure, securing devices, securing local networks, and securing the perimeter and the concepts and practices to overcome these challenges. This course covers each challenge individually for greater depth of information, with real-world scenarios that show what vulnerabilities look like in everyday computing scenarios. It will explore the various means that an intruder has available to gain access to computer resources. We will investigate weaknesses by discussing the theoretical background behind, and whenever possible, actually performing the attack. We will then discuss methods to prevent/reduce the vulnerability. | | | | | |

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MAJOR ELECTIVE 2 (Student must choose 1 course)

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|------------------------------------|---------|---------|--------------|-----------------|
| IENF853A | Microprocessor Systems | 2 | 2 | 3 | IENF832 |
| This course demonstrates advanced knowledge and understanding of the functions Microprocessor architecture and organization, type of buffering techniques data representation, addressing modes and instruction sets. Memory, PPI, PIT and serial Interfacing with Address decoding, I/O mapping and subsystem, interrupts and other peripheral controller and Programming. practice of the design of a microprocessor system based on Intel 86xxx microprocessor. | | | | | |
| IENF853B | Data Mining | 2 | 2 | 3 | IENF832 |
| This course provides an in-depth study of the field of statistical analysis and data mining as it relates to real-world applications. The course explores how the advanced and complex data mining interdisciplinary field brings together techniques from databases, statistics, machine learning, and information retrieval. It covers the field of data mining and includes the topics data preprocessing, predictive modeling, model evaluation techniques, clustering, classification, and association analysis and anomaly detection. The Laboratory session discusses Weka and R data mining tools and using that perform preprocessing, classifications and clustering based on real word data sets. | | | | | |
| IENF853C | Parallel and Distributed Computing | 2 | 2 | 3 | IENF832 |
| This course provides an overview of distributed and parallel systems, with special emphasis on cloud-based implementations. Topics include distributed systems and models, computer clusters for scalable parallel computing, virtual machines, cloud platform architecture, service-oriented architecture, grid computing, and peer-to-peer computing. The Laboratory exercises will be used to demonstrate various aspects of parallel and distributed computing using MS MPI | | | | | |

MAJOR ELECTIVE 3 (Student must choose 1 course)

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|--|---------|---------|--------------|-----------------|
| IENF854A | Special Topics in Computer Engineering | 2 | 2 | 3 | ENGG821 |
| This course provides applications of various trending topics in computing, theoretical advanced knowledge on current trends, issues, and development in the field of Information Technology to make aware of the changes in technologies, applications and systems. This course help students in research in latest topics, or implementation of software system using latest technologies or understand the research trends in research contributions. | | | | | |
| IENF854B | Digital Control Systems | 2 | 2 | 3 | ENGG821 |
| The course deals with core theories, principles and concepts of Digital Control Systems, z-plane Analysis, Sampling and Reconstruction, Open-Loop and closed-loop Discrete-Time Systems, Time-Response Characteristics, Stability Analysis of Discrete-Time Control Systems, Design of Discrete-Time Controllers, Pole-Placement and Observer Design, and Linear Quadratic Optimal Control. MATLAB is used for analyzing and simulating digital control systems. | | | | | |

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|--|---------------------|-----------|
|  University of Technology Bahrain | Doc. No. | QR-AAD-01 |
| | Revision No. | 01 |
| | Date of Effectivity | 01-09-23 |
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| | | | | | |
|---|-----------------------------------|---|---|---|---------|
| IENF854C | Industrial Control Systems Design | 2 | 2 | 3 | ENGG821 |
| <p>The course deals with core concepts and theories of the hardware and software of Programmable logic controllers. This course also deals with programming, connecting, and testing Programmable Logic Controllers (PLCs) for control of complex industrial/commercial processes. It covers sensor interfacing, application of PLCs in some specific Industrial process, and utilization of a hand-held programmer in troubleshooting PLCs. Hands-on simulation is conducted for the students to understand the critical PLC implementation process in industry using advanced tools such as Festo PLC modules and CodeSys software.</p> | | | | | |



College/Department: College of Engineering

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| | |
|---|---|
| 1. Teaching Institution | University of Technology Bahrain (UTB) |
| 2. University Department | College of Engineering (COE) |
| 3. Programme Title | Bachelor of Science in Mechatronics Engineering (BSME) |
| 4. Title of Final Award | Bachelor of Science in Mechatronics Engineering (BSME) |
| 5. Mode of Attendance | Actual classroom learning-interactive (Full-time) |
| 6. Delivery Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | NQF Level 8 612 NQF Credits (204 ACS Credits) |
| 8. Accreditation | ABET |
| 9. Other external influences | Local External Influences/References <ul style="list-style-type: none"> - Ministry of Education (MOE), Higher Education Council (HEC) - Education and Training Quality Authority (BQA) International External Influences/References <ul style="list-style-type: none"> - Accreditation Board for Engineering and Technology (ABET) |
| 10. Date of production/revision of this specification | September 2025 |
| 11. Aims of the Programme | |
| <p>The Bachelor of Science in Mechatronics Engineering (BSME) is an engineering programme which combines mechanical, electronic, electrical, and computer engineering. It is an interdisciplinary scientific area focusing on the study and design of intelligent programmable systems from an engineering perspective and looks into the design, development and controlling of advanced hybrid systems.</p> <p>Programme Educational Objectives</p> <p>The objectives of BSME programme are to produce graduates who will be able to:</p> <ol style="list-style-type: none"> 1. pursue careers in Mechatronics Engineering or related fields towards the improvement of engineering practice; 2. engage in lifelong learning toward completion of advanced/continuing education or other learning opportunities; and 3. demonstrate professional success through strengthened networks and/or positions of increasing social responsibility. | |
| 12. Learning Outcomes, Teaching, Learning and Assessment Methods | |
| <p>Upon successful completion of the programme, the student will be able to:</p> <ol style="list-style-type: none"> 8. identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics; 9. apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors; 10. communicate effectively with a range of audiences; 11. recognise ethical and professional responsibilities in engineering situations and make informed | |

judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts;

12. function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
13. develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions; and
14. acquire and apply new knowledge as needed, using appropriate learning strategies.

Teaching and Learning Methods

1. Active and Engaged Learning. Students are required to attend the sessions regularly. Students learn by doing, making, writing, designing, creating, and solving. Active participation of the students during discussion is expected. Learning is an active process, and as such, students must engage with the course materials, i.e. reading the textbook and other assigned advanced readings.
2. Problem-based learning. After each topic, sample problems will be provided to students. Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem.
3. Problem-based learning. After each topic, sample problems will be provided to students. Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem.
4. Collaborative learning. Students will be divided into groups with at least three (3) members and each group will be provided with problems or projects that they will work on together to search for understanding, meaning, or solutions. Each group is expected to work together in solving particular engineering problems, discuss the algorithm of the problems, and present the solution in class.
5. Discovery-based learning. During laboratory hours, students will be given experiments to work in groups where they can apply the theories and principles learned. This is an opportunity to have hands-on experience and maximize their learning through actual simulation.

Assessment Methods

Assessment is through a combination of written examinations (essays, class tests, homework) and assessed coursework (problem sets, laboratory exercises and machine problems).

13. Programme Structure**BACHELOR OF SCIENCE IN MECHATRONICS ENGINEERING (BSME)****CURRICULUM PLAN EFFECTIVE AY2019-2020****FOUNDATION COURSES**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|----------------------|---------|---------|--------------|----------------|
| ENGL500 | English Foundation | 12 | 0 | 0 | |
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------|----------------------------------|---------|---------|--------------|-----------------|
| ARAB400A | Arabic Language | 3 | 0 | 3 | |
| CHEM400 | General Chemistry 1 | 2 | 2 | 3 | |
| CENG411 | Introduction to Computing | 2 | 2 | 3 | |
| ENGL401 | English Communication Skills 1 | 3 | 0 | 3 | |
| EUTH400 | Euthenics 1 | 1 | 0 | 0 | |
| MATH401 | College Algebra | 3 | 0 | 3 | |
| MATH402 | Plane and Spherical Trigonometry | 3 | 0 | 3 | |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------|--|---------|---------|--------------|---------------------|
| CENG511 | Computer Programming | 2 | 2 | 3 | CENG411 |
| ENGL402 | English Communication Skills 2 | 3 | 0 | 3 | ENGL401 |
| EUTH401 | Euthenics 2 | 1 | 0 | 0 | EUTH400 |
| HIST400 | History of Bahrain and GCC | 3 | 0 | 3 | |
| MATH406 | Differential Calculus with Analytic Geometry | 5 | 0 | 5 | MATH401, MATH402 |
| SOCI400 | Sociology | 3 | 0 | 3 | |
| TOTAL | | | | 17 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|---|---------|---------|--------------|-----------------|
| CENG523 | Advanced Programming | 2 | 2 | 3 | CENG511 |
| ENGL403 | Speech and Oral Communication | 2 | 2 | 3 | ENGL402 |
| MATH501 | Integral Calculus with Differential Equations | 5 | 0 | 5 | MATH406 |
| PHYS501 | University Physics 1 | 2 | 2 | 3 | MATH406 |
| SCIE400 | Biology | 2 | 2 | 3 | |

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TOTAL**17****SECOND YEAR****FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-----------------------|----------------|----------------|---------------------|------------------------|
| ENVS400 | Environmental Science | 3 | 0 | 3 | SCIE400 |
| ENGL502 | Technical Writing | 3 | 0 | 3 | ENGL402 |
| ENGG410 | Engineering Drawing | 2 | 2 | 3 | |
| ENGG520 | Engineering Materials | 3 | 0 | 3 | CHEM400 |
| MATH503 | Discrete Mathematics | 3 | 0 | 3 | MATH401 |
| PHYS502 | University Physics 2 | 2 | 2 | 3 | |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|----------------------------|----------------|----------------|---------------------|------------------------|
| ENGG531 | Electric Circuit Theory 1 | 2 | 2 | 3 | MATH501, PHYS502 |
| ENGG532 | Thermodynamics | 3 | 0 | 3 | PHYS501 |
| HUMR400 | Human Rights | 3 | 0 | 3 | SOCI400 |
| MATH409 | Probability and Statistics | 3 | 0 | 3 | MATH503 |
| MATH502 | Advanced Mathematics | 3 | 0 | 3 | MATH501 |
| PHYS503 | University Physics 3 | 2 | 2 | 3 | PHYS502 |
| TOTAL | | | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--------------------------------|----------------|----------------|---------------------|------------------------|
| ENGG521 | Engineering Mechanics | 3 | 0 | 3 | PHYS501 |
| ENGG522 | Engineering Economy | 3 | 0 | 3 | MATH406 |
| ENGG534 | Electronics 1 | 2 | 2 | 3 | ENGG531 |
| ENGG611 | Electric Circuit Theory 2 | 2 | 2 | 3 | ENGG531 |
| MATH504 | Multivariate Calculus | 2 | 2 | 3 | MATH501 |
| MATH505 | Numerical Methods and Analysis | 2 | 2 | 3 | MATH502 |
| TOTAL | | | | 18 | |

THIRD YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|------------------------|
| CENG611 | Data Communication & Networking 1 | 2 | 2 | 3 | CENG411 |
| ENGG535 | Fluid Mechanics | 3 | 0 | 3 | MATH406 |
| ENGG613 | Electronics 2 | 2 | 2 | 3 | ENGG534 |
| ENGG615 | Electromagnetics and Electrical Machines | 3 | 0 | 3 | ENGG611 |
| ENGG627 | Logic Circuit, Switching Theory and Programmable Logic Devices | 3 | 2 | 4 | ENGG534 |
| MATH506 | Linear Algebra | 2 | 2 | 3 | MATH504 |
| TOTAL | | | | 19 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-------------------------------------|----------------|----------------|---------------------|------------------------|
| ENGG501 | Safety Engineering | 2 | 0 | 2 | ENGG611 |
| ENGG533 | Strength of Materials | 3 | 0 | 3 | ENGG521 |
| MECH610 | Pneumatics and Electro-Pneumatics | 2 | 2 | 3 | ENGG535, ENGG627 |
| ENGG614 | Control Systems | 2 | 2 | 3 | ENGG611 |
| MECH631 | Power Electronics | 3 | 2 | 4 | ENGG613 |
| MECH633 | Introduction to Fuzzy/Neural System | 3 | 2 | 4 | ENGG627 MATH503 |
| TOTAL | | | | 19 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-------------------------------------|----------------|----------------|---------------------|------------------------|
| MATH507 | Optimization Methods | 3 | 0 | 3 | MATH505 |
| MECH621 | Linear Systems | 2 | 2 | 3 | ENGG614 |
| MECH623 | Hydraulics and Electrohydraulics | 3 | 2 | 4 | ENGG535, ENGG627 |
| MECH624 | Programmable Logic Controllers | 3 | 2 | 4 | MECH610 |
| MECH641 | Process Instrumentation and Control | 3 | 2 | 4 | ENGG532, ENGG614 |
| TOTAL | | | | 18 | |

FOURTH YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|--|----------------|----------------|---------------------|------------------------|
| ENGG639 | Professional Ethics and Engineering Laws | 3 | 0 | 3 | ENGG501 |
| MECH639 | Microcontroller | 2 | 2 | 3 | ENGG627 |
| MECH642 | Machine Vision | 3 | 2 | 4 | MECH621 |
| MECH643 | Robot Kinematics, Dynamics and Control | 3 | 2 | 4 | MECH631, MECH621 |
| MECH644 | Modular Production System | 3 | 2 | 4 | MECH624 |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---|----------------|----------------|---------------------|--------------------------------|
| ENGG638 | Engineering and Project Management | 3 | 0 | 3 | ENGG522 |
| MECH651 | Industrial Attachment | 0 | 6 | 6 | MECH644 |
| MECH652 | Mechatronics Engineering Design Project A | 0 | 6 | 3 | Completion of 162 credit Units |
| TOTAL | | | | 12 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|---|----------------|----------------|---------------------|------------------------|
| MECH645 | Technopreneurship | 3 | 0 | 3 | ENGG638 |
| MECH653 | Major Elective 1 | 2 | 2 | 3 | SEE LIST BELOW |
| MECH661 | Mechatronics Engineering Design Project B | 0 | 6 | 3 | MECH652 |
| MECH662 | Major Elective 2 | 2 | 2 | 3 | SEE LIST BELOW |
| TOTAL | | | | 12 | |
| Grand Total | | | | 204 | |

ELECTIVE COURSES**MAJOR ELECTIVE 1 (Student Must Choose 1 Course)**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--------------------|-------------------------------------|----------------|----------------|---------------------|------------------------|
| MECH653A | Data Communication and Networking 2 | 2 | 2 | 3 | CENG611 |
| MECH653C | System Modeling and Simulation | 2 | 2 | 3 | ENGG614 |
| MECH653D | Digital Control Systems | 2 | 2 | 3 | ENGG614 |

MAJOR ELECTIVE 2 (Student Must Choose 1 Course)

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|---------------------------|---------|---------|--------------|-----------------|
| MECH662A | Wireless Communications | 2 | 2 | 3 | CENG611 |
| MECH662C | Digital Signal Processing | 2 | 2 | 3 | MECH639 |
| MECH662D | Power Plant | 2 | 2 | 3 | ENGG532 |

1. Awards and Credits

| | |
|-----------------------------|---|
| Degree/ Certificate Awarded | Bachelor of Science in Mechatronics Engineering |
| Total Units for Degree | 204 |
| Total Trimesters Completed | 12 |

2. Admission Criteria**Admissions Criteria for Undergraduate Students****H. For First Year Undergraduate Applicants**

Acceptance to the University depends on the following admissions requirements:

25. Completely filled out an admission application form.
26. Minimum secondary school scores 60% or its equivalent.
27. Online Placement test (Oxford Online Placement Test (OOPT)) Result (if needed)
28. Submission of all required documents stated in the Admissions Policy.

To be admitted to any undergraduate programme, the applicant must satisfy the minimum secondary school grades or its equivalent without the need to take the remediation classes of English and Math, as shown in the following table:

| Subtest Component for Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification | | BSME |
|---|----------------------------------|-------------------|
| Mathematics | Science/ Technical/General Track | At least 70% or C |
| | Commercial Track | At least 80% or B |
| | Literature and Islamic Tracks | At least 80% or B |
| Science | - | 60 |
| English | - | At least 80 or B |

*This is applicable to Bahraini and similarly equivalent qualification

6. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program.

| Subtest Component for Other Qualification (Indian, Pakistan, and West African) | | BSME |
|---|----------------------------------|-------------------|
| Mathematics | Science/ Technical/General Track | At least 51 or C1 |
| | Commercial Track | At least 71 or B1 |
| | Literature and Islamic Tracks | At least 71 or B1 |
| Science | | 60 |
| English | | At least 71 or B1 |

*Note: Science component is subject to the evaluation of the Dean.

For the undergraduate applicant who did not meet the minimum required secondary school grades in Mathematics and English or its equivalent, his/her admissions depend on the following criteria:

| Programme | Secondary School Grade | Placement Test in English (OOPT) | Remarks |
|----------------|--|----------------------------------|---|
| All Programmes | 60-79 % grade in English | Score \geq 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| BSME | For Commercial Track: Score 50-79% in Math For Scientific, General, and technical Track: Score 50-69% in Math | N/A | Foundation Course in Math |
| | For Science score <60% | N/A | Tutorial class in general sciences |
| All Programmes | CGPA <60% for Bahraini and KSA CGPA <41% for Indian and Pakistan | N/A | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

a. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

b. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program (English Foundation).

c. IELTS/TOEFL

Applicants who submit official IELTS or TOEFL certificates issued by accredited examination centers, with a minimum score of 450 on the TOEFL (paper-based), 131 on the TOEFL (computer-based), or 5.0 on the IELTS, are exempted from taking the required English Placement Test.

In addition, applicants who obtain an IELTS score of 5.5 or higher or a TOEFL score that meets the equivalent standard may qualify for English course exemptions based on their results. This policy recognizes academic achievement by allowing eligible students to be exempted from enrolling in introductory English courses upon admission.

| IELTS/TOEFL Scores | Exemption |
|---|---|
| Qualified applicants with 5.5 IELTS scores or TOEFL: 496 (paper-based) or 169 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 (English Communication Skills 1) |
| Qualified applicants with 6.0 IELTS scores or TOEFL: 546 (paper-based) or 211 (computer based) | Satisfying this requirement means to be exempted from taking ENGL401/ENGL611 and ENGL402/ENGL621 (English Communication Skills 1 and 2) |

d. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature and Islamic tracks must take the remediation course in Math.

e. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

B. For Undergraduate Transfer Student Applicants**Application Requirements:**

43. Completely filled out an admission application form
44. Official Transcript of Records (TOR) from the university previously attended. Rules and regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school certificates are to be applied when necessary.
45. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
46. Certificate of Transfer from the university previously attended stamped by MOE, if any.
47. Withdrawal Certificate stamped by MOE
48. Submission of all required documents stated in the admissions policy.

Admissions Requirements:

22. For Bahrain and KSA qualifications, the applicant should have at least a secondary school average of 60%. For non-Bahrain secondary qualifications (Indian and Pakistan) the applicant should have at least 41% secondary school average; and for other non-Bahraini qualifications please refer to the table of cut-off.
23. If the applicant has taken and passed courses in English and Mathematics in the previous university, the applicant will be exempted in taking the remedial courses in both English and Mathematics. The applicant may proceed to mainstream university courses and is eligible to apply for credit transfer.
24. If the applicant has not taken any course in English and Mathematics, the basis for evaluation whether remedial course in English and mathematics is required or not is the subject scores in his/her last year in the secondary school certificate using the table presented earlier.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. Practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or re-admitted student from UTB.

The University requires the undergraduate student to complete at least 50% of the required credit units/hours of a programme in residence at UTB. The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit units/hours based on his/her original degree from another university.

3. CGPA Requirement for Graduation

The required CGPA for an undergraduate student to be eligible for graduation is 2.0 out of 4

4. Career Pathways

The BSME graduates can pursue a career as production engineer, instrumentation engineer, production/manufacturing supervisor, PLC programmer, design engineer, vocational instructor/trainer,

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laboratory engineer, maintenance supervisor, or sales engineer. In addition, the programme can lead graduates for postgraduate degrees in engineering.

18. BSME AY2019-2020 CURRICULUM SKILLS MAPPING

| Year / Level | Course Code | Course Title | Core (C) or Elective (E) | Programme Learning Outcomes | | | | | | |
|-------------------|-------------|---|--------------------------|-----------------------------|-----|-----|-----|-----|-----|-----|
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| Year 1 1st Tri | ARAB400 | Arabic Language | (C) | | | | ✓ | | | |
| | CHEM400 | General Chemistry 1 | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| | CENGI411 | Introduction to Computing | (C) | ✓ | | | | | ✓ | |
| | ENGL401 | English Communication Skills 1 | (C) | | | ✓ | | | | |
| | EUTH400 | Euthenics 1 | (C) | | | | | | | |
| | MATH401 | College Algebra | (C) | ✓ | | | | | | |
| | MATH402 | Plane and Spherical Trigonometry | (C) | ✓ | | | | | | |
| Year 1 2nd Tri | CENG511 | Computer Programming | (C) | ✓ | | | | | ✓ | |
| | ENGL402 | English Communication Skills 2 | (C) | | | ✓ | | | | |
| | EUTH401 | Euthenics 2 | (C) | | | | | | | |
| | HIST400 | History of Bahrain and GCC | (C) | | | | ✓ | | | |
| | MATH406 | Differential Calculus with Analytic Geometry | (C) | ✓ | | | | | | |
| | SOCI400 | Sociology | (C) | | | | ✓ | | | |
| Year 1 3rd Tri | CENG523 | Advanced Programming | (C) | ✓ | | | | | ✓ | |
| | ENGL403 | Speech and Oral Communication | (C) | | | ✓ | | | | |
| | MATH501 | Integral Calculus with Differential Equations | (C) | ✓ | | | | | | |
| | PHYS501 | University Physics 1 | (C) | ✓ | ✓ | | | ✓ | ✓ | |
| | SCIE400 | Biology | (C) | ✓ | | | | ✓ | ✓ | |
| | ENVS400 | Environmental Science | (C) | | | | ✓ | | | ✓ |
| Year 2 1st Tri | ENGL502 | Technical Writing | (C) | | | ✓ | | | | |
| | ENGG410 | Engineering Drawing | (C) | ✓ | | | | | | |
| | ENGG520 | Engineering Materials | (C) | ✓ | | | ✓ | | | |
| | MATH503 | Discrete Mathematics | (C) | ✓ | | | | | | |
| | PHYS502 | University Physics 2 | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| | CENG523 | Advanced Programming | (C) | ✓ | | | | | ✓ | |
| Year 2 2nd Tri | ENGG531 | Electric Circuit Theory 1 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| | ENGG532 | Thermodynamics | (C) | ✓ | | | | | | ✓ |

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| | | | | | | | | | | |
|---------------------------|---------|--|-----|---|---|---|---|---|---|---|
| Tri | HUMR400 | Human Rights | (C) | | | | ✓ | | | |
| | MATH409 | Probability and Statistics | (C) | ✓ | | | | | | |
| | MATH502 | Advanced Mathematics | (C) | ✓ | | | | | ✓ | ✓ |
| | PHYS503 | University Physics 3 | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| Year 2 3rd Tri | ENGG521 | Engineering Mechanics | (C) | ✓ | | | | | | |
| | ENGG522 | Engineering Economy | (C) | ✓ | | | ✓ | | | |
| | ENGG534 | Electronics 1 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| | ENGG611 | Electric Circuit Theory 2 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | MATH504 | Multivariate Calculus | (C) | ✓ | | | | | ✓ | ✓ |
| | MATH505 | Numerical Methods and Analysis | (C) | ✓ | | | | | ✓ | ✓ |
| Year 3 1st Tri | CENG611 | Data Communication & Networking 1 | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| | ENGG535 | Fluid Mechanics | (C) | ✓ | | | | | | ✓ |
| | ENGG613 | Electronics 2 | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | ENGG615 | Electromagnetics and Electrical Machines | (C) | ✓ | | | | | | ✓ |
| | ENGG627 | Logic Circuit, Switching Theory and Programmable Logic Devices | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | MATH506 | Linear Algebra | (C) | ✓ | | | | ✓ | ✓ | ✓ |
| Year 3 2nd Tri | ENGG501 | Safety Engineering | (C) | | | | ✓ | | | |
| | ENGG533 | Strength of Materials | (C) | ✓ | | | | | | |
| | MECH610 | Pneumatics and Electro-Pneumatics | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| | ENGG614 | Control Systems | (C) | ✓ | ✓ | | | | ✓ | ✓ |
| | MECH631 | Power Electronics | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| | MECH633 | Introduction to Fuzzy/Neural System | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Year 3 3rd Tri | MATH507 | Optimization Methods | (C) | ✓ | | | | | | |
| | MECH621 | Linear Systems | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| | MECH623 | Hydraulics and Electrohydraulic | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | MECH624 | Programmable Logic Controllers | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | MECH641 | Process Instrumentation and Control | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Year 4 1st Tri | ENGG639 | Professional Ethics, Laws and Contracts | (C) | | | | ✓ | | | |
| | MECH639 | Microcontroller | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | MECH642 | Machine Vision | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | MECH643 | Robot Kinematics, Dynamics and Control | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | MECH644 | Modular Production System | (C) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |

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| | | | | | | | | | | |
|-----------------------------------|----------|---|-----|---|---|---|---|---|---|---|
| Year 4 2nd Tri | ENGG638 | Engineering and Project Management | (C) | ✓ | | | ✓ | ✓ | | |
| | MECH651 | Industrial Attachment | (C) | ✓ | | ✓ | ✓ | ✓ | | ✓ |
| | MECH652 | Mechatronics Engineering Design Project A | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Year 4 3rd Tri | MECH645 | Technopreneurship | (C) | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | MECH653A | Major Elective 1: Data Communication and Networking 2 | (E) | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| | MECH653D | Major Elective 1: Digital Control Systems | (E) | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | MECH653C | Major Elective 1: System Modeling and Simulation | (E) | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | MECH661 | Mechatronics Engineering Design Project B | (C) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | MECH662A | Major Elective 2: Wireless Communications | (E) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | MECH662D | Major Elective 2: Power Plant | (E) | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | MECH662C | Major Elective 2: Digital Signal Processing | (E) | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |

BACHELOR OF SCIENCE IN MECHATRONICS ENGINEERING (BSME)**CURRICULUM PLAN EFFECTIVE AY2019-2020****COURSES DESCRIPTION**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|---|---------------------------|---------|---------|--------------|------------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| This course is a foundation in mathematics focusing on the building of the knowledge and skills and understanding to solve problems in college algebra and trigonometry. It deals with the topics on equations and Inequalities; functions and graphs; polynomial and rational Functions; exponential and logarithmic functions; trigonometric functions; trigonometric identities and equations; application of trigonometry; systems of equations and inequalities; and matrices. It also includes the application of the mathematical thinking process. | | | | | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| ENGL500 is a required foundation course for entering students whose English language skills need further improvement and enhancement to be able to cope with the university's academic courses. This course introduces the students to the English language where they get involved and engaged in the learning process. It utilizes an integrated approach in developing the students' English macro communication skills in speaking, listening, grammar, and vocabulary in one phase (preintermediate) which will serve as the benchmark for the next level first year English course. Furthermore, the course intensifies its intended learning objectives with the comprehensive utilization of audio-lingual presentations, includes information related to dictionary use, basic grammar rules, daily use vocabulary words through a variety of contexts, written responses, writing structures, settings of writing, and the process of forming written and spoken communications. Hence, the students are expected to gain more knowledge to communicate effectively in English. | | | | | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|---------------------------|---------|---------|--------------|------------------|
| ARAB400 | ARABIC LANGUAGE | 3 | 0 | 3 | |
| على دراسة أساسيات اللغة العربية كقراءة وتحليل و نقد وبيان خصائص النصوص المطلوبة التي تتناول مختلف ARAB400 يركز مقرر الأجناس الأدبية نثراً وشعراً. كما يركز هذا المقرر على دراسة وفهم وتطبيق القواعد النحوية والأساليب الصرفية الأساسية في اللغة العربية مع مراعاة مهارات الكتابة الإملائية الصحيحة. | | | | | |
| CHEM400 | GENERAL CHEMISTRY 1 | 2 | 2 | 3 | |
| This course demonstrates atomic theories, relationships between structure and properties of matter, scientific notation, density calculation, atomic structure and energy levels, periodic table, ions formation and chemical bonding, chemical reactions and emphasizing the chemical change, balancing equation, Discussion on gas law includes properties and application of gas laws, Acids and bases, solution and clarification of acid – base concept | | | | | |
| CENG411 | INTRODUCTION TO COMPUTING | 2 | 2 | 3 | |
| This course covers the basic concepts of computer hardware and software. It includes the discussion of microcomputer systems and workstations, networking and the internet and the interdisciplinary science of computing. It also provides a discussion of problem solving and algorithm development. Laboratory sessions | | | | | |

focus on the use of word processing, spreadsheets and presentations using Microsoft Office applications.

| | | | | |
|---------|---------------------------------|---|---|---|
| ENGL401 | ENGLISH COMMUNICATIONS SKILLS 1 | 3 | 0 | 3 |
|---------|---------------------------------|---|---|---|

This is an introductory course in English communication designed to provide comprehensive, up-to-date and relevant instruction in the correct use of grammar. It intends to build up students' confidence in communicating their thoughts, ideas, information and messages through the functions and structures of different words, phrases, clauses and sentences. In addition, the integration of language skills increases their communicative competence and prepares them for the academic and social challenges in college and beyond.

| | | | | |
|---------|-------------|---|---|---|
| EUTH400 | EUTHENICS 1 | 1 | 0 | 0 |
|---------|-------------|---|---|---|

This course focuses on the discussion of the policies and procedures that are intended to guide each member of the UTB community in the performance of his/her role. This is used as a resourceful tool that orients the students with academic and non-academic policies of UTB. It contains the history, vision / mission and objectives of the institution, the services and academic support available.

| | | | | |
|----------|-----------------|---|---|---|
| MATH 401 | COLLEGE ALGEBRA | 3 | 0 | 3 |
|----------|-----------------|---|---|---|

This course is designed to familiarize learners with the main theories, principles and concepts of college algebra that are useful in analysis and simplification of basic and some advanced mathematical problems. Content includes functions which are polynomial, rational, exponential, logarithmic and related equations. Sketching graphs, Matrices, determinants, progressions and inequalities as applied to engineering.

| | | | | |
|---------|----------------------------------|---|---|---|
| MATH402 | PLANE AND SPHERICAL TRIGONOMETRY | 3 | 0 | 3 |
|---------|----------------------------------|---|---|---|

This course is designed to familiarize learners with main theories, principles and concepts of plane and spherical trigonometry that are useful in analysis and simplification of some advanced mathematical problems. The course covers topics on angles and their measurement, trigonometric/circular functions, inverse trigonometric functions, identities, graphs of trigonometric functions, solutions of trigonometric equations, solutions of right and oblique plane triangles, introduction to spherical trigonometry and its applications.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|---------------------------------|---------|---------|--------------|------------------|
| CENG511 | COMPUTER PROGRAMMING | 2 | 2 | 3 | CENG411 |
| This course covers problem solving and algorithm development, which emphasizes on developing good programming habits. It includes discussion of an overview of the Java language syntax, including classes, methods, variables, conditional statements, and control flow. The laboratory focuses on the implementation of the programming theories and concepts using Java. | | | | | |
| ENGL402 | ENGLISH COMMUNICATIONS SKILLS 2 | 3 | 0 | 3 | ENGL401 |
| This is an intermediate course in English communication geared towards equipping the college students with writing skills in preparation for academic writing. It progresses from familiarizing the sentence conventions to balancing the structures of the sentence for variation and rhythm. Further, it enables students to follow the principles that govern the composition writing in achieving unity, coherence and emphasis; to improve their expository, descriptive, narrative and argumentative works and to get hold of the discipline in academic writing for future advantages by providing them the opportunity in adhering the process of writing for effective communication. | | | | | |
| EUTH401 | EUTHENICS 2 | 1 | 0 | 0 | EUTH400 |
| The course introduces the students to the guidelines on disciplinary actions as regards violations of the rules and regulations of the University. The students will be taught the general concepts and principles on | | | | | |

values formation, attitudes and personality development. This course will encourage the students to participate in classroom discussion for them to better understand and appreciate acceptable social norms and the conduct of an educated individual.

| | | | | | |
|--|----------------------------|---|---|---|--|
| HIST400 | HISTORY OF BAHRAIN AND GCC | 3 | 0 | 3 | |
| <p>دراسة تاريخ مملكة البحرين ومنطقة الخليج العربي ويظهر تعداد للأحداث الهامة في البحرين ومنطقة الخليج العربي HIST400 يتناول مقرر بدءاً من الحضارات القديمة و مروراً إلى العهد وأثارها على الوضع الراهن ، و يغطي الأهمية الاستراتيجية والمكانية للبحرين للبحرين الاسلامي، والاحتلال البرتغالي، وصراع القوى في القرن السابع عشر، وصعود قبيلة العتوب، والبحرين تحت الحماية البريطانية وابرام ، ويتناول وصف الاماكن والشخصيات والتطورات التاريخية المعاهدات مع بريطانيا، وانسحاب القوات البريطانية من البحرين والخليج والانجازات في البحرين في عهد حكام البحرين، والبعد العربي والاسلامي في تكوين هوية البحرين ، الانضمام لمجلس التعاون الخليجي ، وتاريخ دول الخليج العربي (دول مجلس التعاون الخليجي)، ومع نهاية الكورس يكون الطالب قادر على تحليل الجذور التاريخية للبحرين لتكوين الهوية الوطنية ، والتمتع بمقدرة الاتصال الشفهي والكتابي والعمل بشكل منتج وفعال ضمن فريق واحد.</p> | | | | | |

This course includes the history of the Kingdom of Bahrain and the Arabian Gulf region. It includes the important events in Bahrain and the Arabian Gulf region and their impact on the current situation. It covers the strategic importance of Bahrain, starting with "Ancient civilizations and passing through" the Islamic era, Bahrain's entry into Islam, Portuguese occupation, competition of powers in the 17th century and the rise of a tribe of Al-Atub. It includes the history of Bahrain under the British protection and the conventions between Bahrain and Great Britain up to British troops leaving the region. It describes the places and persons as well as the historical developments and achievement in Bahrain during the time of Al- Khalifa. It includes independence of Bahrain, issuing of the first constitutional law, reform project by His Majesty King Hamad, constitutional amendments, establishment of GCC, and history of Arab Gulf states. It makes the student able to present his patriotic character through historical discussions.

| | | | | | |
|---|--|---|---|---|------------------|
| MATH406 | DIFFERENTIAL CALCULUS WITH ANALYTIC GEOMETRY | 5 | 0 | 5 | MATH401, MATH402 |
| <p>This course is intended to develop practical skills in differential calculus and analytic geometry. Emphasis is placed on functions, limits and continuity, fundamental concepts of analytic geometry, explicit and implicit differentiation of algebraic and transcendental functions, conics, higher derivatives, polar coordinates and its applications (equations of tangent and normal lines, sketching polynomial curves, maxima and minima problems and time rates.</p> | | | | | |

| | | | | | |
|---|-----------|---|---|---|--|
| SOCI400 | SOCIOLOGY | 3 | 0 | 3 | |
| <p>This course is designed to expose students to a detailed approach to studying society. It intends to give emphasis on the sociological perspectives, relationships with other social sciences, the main figures in sociological development, including introduction to culture, transformation of societies, importance of socialization, social groups, deviance and social control. Further, it integrates the discussions on social institutions that enable the college students to understand the economic perspective from ancient to present, the evolution of education and the current viewpoint of family.</p> | | | | | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|---|----------------------|---------|---------|--------------|------------------|
| CENG523 | ADVANCED PROGRAMMING | 2 | 2 | 3 | SCIE400 |
| <p>This course enables students to understand and develop Java applications. Topics include arrays, recursion, exception handling, inheritance and polymorphism, file handling, basic applets, strings, GUI and Java events. The laboratory focuses on the development of programs in Java. It starts from the concepts of arrays and</p> | | | | | |

progresses from exception handling to Basic Applets.

| | | | | | |
|---------|-------------------------------|---|---|---|---------|
| ENGL403 | SPEECH AND ORAL COMMUNICATION | 2 | 2 | 3 | ENGL402 |
|---------|-------------------------------|---|---|---|---------|

This is a developmental course in English communication geared towards competent, efficient and effective interpersonal speaking across communicative contexts. It refines the oral communication skills of the college students through accurate articulation of segmental phonemes, pronunciation drills and enunciation of the suprasegmental features of speech, specifically sentential stress and intonation. Further, it incorporates the mechanics and techniques of speech craft and delivery with emphasis on practical speaking experiences and analysis of audience psychology, which are deemed applicable in diverse speech situations.

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|---------|---|---|---|---|---------|
| MATH501 | INTEGRAL CALCULUS WITH DIFFERENTIAL EQUATIONS | 5 | 0 | 5 | MATH406 |
|---------|---|---|---|---|---------|

This course provides the students with knowledge and understanding of core concepts, theories and principles in evaluating definite and indefinite integrals and their applications in solving engineering and computing problems. The course also covers solutions to ordinary differential equations which can be used in modeling important applications in the scientific and engineering fields.

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|---------|----------------------|---|---|---|---------|
| PHYS501 | UNIVERSITY PHYSICS 1 | 2 | 2 | 3 | MATH406 |
|---------|----------------------|---|---|---|---------|

This course is designed to explore the concepts of motion using vectors and other mathematical models and their advanced application, such as the application of Newton's laws of motion, projectile motion, work, energy, momentum and impulse, rotational dynamics, equilibrium of a rigid body, and periodic motion.

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|---------|---------|---|---|---|--|
| SCIE400 | BIOLOGY | 2 | 2 | 3 | |
|---------|---------|---|---|---|--|

This course focuses on the detailed knowledge and understanding of the fundamental life processes and functions of living systems including the nature of knowledge relating to cell structure, function and metabolism, bioenergetics, genetics and biotechnology, cellular reproduction and cell division, evolution, biodiversity, and ecology. The students will demonstrate the importance of explanations based on evidence through inquiry-based laboratory activities to provide insight into scientific methods.

SECOND YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|-------------|-----------------------|---------|---------|--------------|------------------|
| ENVS400 | ENVIRONMENTAL SCIENCE | 3 | 0 | 3 | SCIE400 |

This course is an introduction to environmental science. It examines the ecological foundation of environmental systems; the ecological impacts of population growth and environmental degradation by humans and the strategies for sustainable management of environment and natural resources; mineral resource extraction; water resource use and water pollution; air pollution and climate change; and the conventional and sustainable energy supply.

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|---------|-------------------|---|---|---|---------|
| ENGL502 | TECHNICAL WRITING | 3 | 0 | 3 | ENGL402 |
|---------|-------------------|---|---|---|---------|

This is an advanced course in English academic writing designed to deal with the application of the technical writing principles with the correspondence on business, science, and technology. It aims to develop the technical writing skills and communication of the college students thru the discussions of its elements and ethics with the use of digital technologies. Furthermore, it enables students to adapt the various communication routes in the workplace, to conceptualize suitable contents of technical writing, to understand the characteristics and other methods of communication techniques, to plan and organize advanced level tasks and to work effectively and with accountability with other team members in a creative and productive manner, in any language learning scenario when achieving personal and group outcomes.

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|---|-----------------------|---|---|---|------------------|
| ENGG410 | ENGINEERING DRAWING | 2 | 2 | 3 | |
| The course covers the application of Computer-Aided Drafting Design (CADD) in sketching and drawing to produce engineering drawings. The student will learn the appropriate AutoCAD drawing and modifying commands to generate 2D drawings and orthogonal projections of 3D drawings. In addition, the course will cover editing, modifying and plotting 2D and 3D drawings. | | | | | |
| ENGG520 | ENGINEERING MATERIALS | 3 | 0 | 3 | CHEM400 |
| This course deals with engineering materials deals with the study the core principle and concept of engineering material science. It covers the defining features of properties and structure of different engineering materials. It discusses the classifications of materials such as metals, polymers, ceramics, and composites. It also covers the formation of bonds and forces between particles, amorphous and crystalline structure, the impact factor, solid solutions and phase diagram, and defects in crystalline materials. It also covers the analysis of the physical, mechanical, electrical and magnetic properties of materials. This also emphasizes the various considerations in selecting materials appropriate for a particular application. | | | | | |
| MATH503 | DISCRETE MATHEMATICS | 3 | 0 | 3 | MATH401 |
| This course introduces the basic concepts and techniques of discrete mathematics. The course includes the discussion of mathematical logic, propositions, quantifiers, predicates, proof techniques, mathematical induction, fundamentals of set theory, sets, power sets, algebra of sets, relations, functions, countability and finiteness, graphs and trees. | | | | | |
| PHYS502 | UNIVERSITY PHYSICS 2 | 2 | 2 | 3 | PHYS501, MATH501 |
| This course is designed to explore the concepts of electricity and magnetism using the concepts of mechanics, vectors, and other mathematical models and their advanced application, such as application of Coulomb's law, Gauss's law, Ohm's law, Kirchhoff's laws, electric potential and potential difference, basic circuits, series and parallel circuits and combinations, magnetic field and flux, induced EMF and applications such as electric motors and basic AC electric generators. | | | | | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|---|---------------------------|------------|------------|-----------------|------------------|
| ENGG531 | ELECTRIC CIRCUIT THEORY 1 | 2 | 2 | 3 | MATH501, PHYS502 |
| The course deals with the study of core theories, principles and concepts for analysis of DC networks through the application of basic laws and network theorems. It covers the inter relationship between the parameters of DC circuits, critical analysis of complex circuits excited by DC voltages and current sources through basic circuit laws - KVL and KCL and structured methods and theorems like nodal analysis, Mesh analysis, superposition, Maximum power transfer & Millman's theorem. | | | | | |
| ENGG532 | THERMODYNAMICS | 3 | 0 | 3 | PHYS501 |
| Thermodynamics deals with the study associated with details of the properties of the pure substance to adept the necessary process related to energy concepts, ideal gas laws, work and heat, processes of ideal gases, and gas and steam cycles. It also includes a critical evaluation of various laws and its practical applications of thermodynamic principles in power plan. | | | | | |
| HUMR400 | HUMAN RIGHTS | 3 | 0 | 3 | SOCI400 |
| يتناول هذا المقرر تمكين الطالب و جعله قادرا على معرفة الخلفية التاريخية لحقوق الإنسان، المفاهيم و الاصول الفلسفية و الرؤيا الاسلامية لحقوق الانسان كما يتناول بالعرض و التحليل مصادر حقوق الإنسان كإعلان العالمي لحقوق الإنسان، و العهد الدولي الخاص بالحقوق المدنية و السياسية و العهد الدولي الخاص بالحقوق الاقتصادية و الإجتماعية و الثقافية و الوثائق الدولية الأخرى ذات الصلة بحقوق الإنسان ماورد فيها من الحقوق و التمييز بينها. كما يتناول بالمقارنة ذاتها ما ورد في الوثائق الوطنية مثل دستور مملكة البحرين و الميثاق الوطني و كيفية تطبيقها. و يُمكن الطلبة من مهارات تحليل و تفسير و نقد التطبيقات و التجاوزات فضلا عن القدرة على التحليل و | | | | | |

التواصل و عرض مسائل حقوق الإنسان بمختلف الوسائل.

This course makes the students able to know the background, main concepts of Human Rights and the philosophical thoughts and Islamic view which contribute to modern Human Rights. It makes them able to analyze what is mentioned in different kinds of Human Rights sources such as Universal Declaration of Human Rights, International Covenant on Civil and Political Rights and International Covenant on Economic, Social and Cultural Rights. It deals in the same approach with the National Sources of Human Rights such as the Constitutional Law of Kingdom of Bahrain and National Action Charter with applications as well. The course makes the students able to analyze, discuss and debate Human Rights issues in different ways.

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|---------|----------------------------|---|---|---|---------|
| MATH409 | PROBABILITY AND STATISTICS | 3 | 0 | 3 | MATH503 |
|---------|----------------------------|---|---|---|---------|

This course provides a demonstration of the main concepts of probability and statistics with applications. IT also covers identifying the theorem of probability and linked with real life problems. How to differentiate between the combination and permutation; Explain how to find the mean and variance from the moment generating function. Explain and interpret the findings from different hypothesis tests for decision making. Finally, SPSS will be used to run the statistical measures (e.g. hypothesis tests and regression model).

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|---------|----------------------|---|---|---|---------|
| MATH502 | ADVANCED MATHEMATICS | 2 | 2 | 3 | MATH501 |
|---------|----------------------|---|---|---|---------|

This course deals with the study of complex numbers, series solutions of ordinary differential equations by power series, Bessel Function, Frobenius method. Basics of Fourier series, Fourier transform, Laplace and inverse Laplace Transforms. Using MATLAB or other mathematical software in order to solve mathematical problems.

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|---------|----------------------|---|---|---|---------|
| PHYS503 | UNIVERSITY PHYSICS 3 | 2 | 2 | 3 | PHYS502 |
|---------|----------------------|---|---|---|---------|

This course is designed to explore the concepts of heat and thermodynamics, waves and optics, relativity, molecular, atomic, and nuclear physics using the concepts of mechanics, electricity and magnetism, vectors, and other mathematical models and their advanced application, such as the application of the laws of thermodynamics, light and electromagnetic waves, Einstein's special theory of relativity, Planck's Quantum theory, de Broglie's waves, Heisenberg's Uncertainty Principle, Dirac's electron theory, Hund's Rule, and atomic models from Thompson's to Quantum Mechanical, as well as nuclear models.

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|-----------------------|------------|------------|-----------------|------------------|
| ENGG521 | ENGINEERING MECHANICS | 3 | 0 | 3 | PHYS501 |
| This course deals with the core theories, principles and concepts of force systems, force components, free body diagrams, vectors, resultant of force systems, moment of forces, and equilibrium of rigid bodies. It also includes critical analysis of structures, methods of analysis of trusses, and, distributed forces centroids and center of gravity, and the theory and application of friction. | | | | | |
| ENGG522 | ENGINEERING ECONOMY | 3 | 0 | 3 | MATH406 |
| This course deals with the advanced study of the core theories, principles and concepts of economic environment, interest and money-time relationship, depreciation, capital financing, comparing alternatives, replacement studies, break-even analysis, benefit cost ratio, and benefit cost difference. It presents mathematical techniques and practical advice for evaluating decisions in the design and operation of engineering systems. | | | | | |
| ENGG534 | ELECTRONICS 1 | 2 | 2 | 3 | ENGG531 |
| Fundamentals of semiconductors, PN junction diode, Analysis, application and design of diode circuits, Zener | | | | | |

diode characteristics and applications, special purpose diodes. Fundamentals of Bipolar junction transistor (BJT), characteristic; amplifier types of CE, CC and CB, dc analysis and switch circuit analysis; different biasing, Multistage Amplifiers, Differential Amplifier and CMRR.

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|---------|---------------------------|---|---|---|---------|
| ENGG611 | ELECTRIC CIRCUIT THEORY 2 | 2 | 2 | 3 | ENGG531 |
|---------|---------------------------|---|---|---|---------|

This course deals with core theories, principles and concepts of the topics of sinusoidal voltage and current on RLC circuits, vector algebra and its application to AC circuit analysis, sinusoidal and non-sinusoidal single phase system, and three phase systems. It also covers reactance, impedance, resonance, power in AC circuits, power factor correction and impedance network. The course evaluates the theorems which includes Kirchhoff's laws, Mesh, Superposition, Nodal Analysis, Thevenin's, Norton, and Maximum power transfer.

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|---------|-----------------------|---|---|---|---------|
| MATH504 | MULTIVARIATE CALCULUS | 2 | 2 | 3 | MATH501 |
|---------|-----------------------|---|---|---|---------|

This is the third part of the course in calculus focused on vector and multi-variable calculus. Topics associated with the course demonstrate advanced knowledge and understanding of the following: vectors and vector operators, calculus of functions of several variables including partial differentiation and multiple integrals, Lagrange multipliers, applications of partial differentiation, line integrals, Green's theorem, Stoke's theorem, and Divergence theorem. The course also includes laboratory components that make use of MATLAB as a tool in solving problems in Multivariate Calculus.

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|---------|--------------------------------|---|---|---|---------|
| MATH505 | NUMERICAL METHODS AND ANALYSIS | 2 | 2 | 3 | MATH502 |
|---------|--------------------------------|---|---|---|---------|

This course demonstrates critical knowledge and understanding of specialist theories, principles and concepts of the study of numerical approximations and errors, numerical solutions of non-linear equations, interpolation and curve fittings, numerical differentiation and integration. The course also covers analysis of accuracy of numerical differentiation and integration methods and solution of initial value problems using Euler Method. Analysis of accuracy of Euler's method. The course also includes laboratory components that make use of MATLAB as a tool in solving problems in Numerical Analysis.

THIRD YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|-------------|-------------------------------------|---------|---------|--------------|------------------|
| CENG611 | DATA COMMUNICATION AND NETWORKING 1 | 2 | 2 | 3 | CENG411 |

This course provides discussion of data communications and networking. It includes a detailed discussion of the different network models, concepts that have direct effect on the efficiency of a network, network technologies, distributed computation, networking, communication software, and security issues.

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|---------|-----------------|---|---|---|---------|
| ENGG535 | FLUID MECHANICS | 3 | 0 | 3 | MATH406 |
|---------|-----------------|---|---|---|---------|

Fluid Mechanics deals with the study associated with details of the properties of the fluid and gas to adept the necessary Knowledge related to fluid power concepts such as the fluid properties of compressible and incompressible fluids which include viscosity, Density, bulk modulus and compressibility. The topics covered are Fluid Statics; fluid mechanics fundamentals, including concepts of mass and momentum Integral relations for control volume: Bernoulli, energy and momentum equations. Flow in pipes; laminar and turbulent flow, Reynolds number and Moody chart, laminar and turbulent boundary layer fundamentals. The learning approach is to apply engineering principles to performance analysis and prediction of simple fluid systems such as hydraulics and pneumatics.

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|---------|---------------|---|---|---|---------|
| ENGG613 | ELECTRONICS 2 | 2 | 2 | 3 | ENGG534 |
|---------|---------------|---|---|---|---------|

This is an advanced course in electronics which deals with concept, analysis and design of electronic circuits using linear and integrated devices. In this course include AC and DC analysis, principles and concepts of

frequency response of BJT amplifier and further extends the study to multistage amplifier and various FET. The other topics include study and critical analysis of Operational Amplifier, its application, Feedback topologies & explore NE555 Timer and its applications.

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|---------|---|-----|---|---|---|---------|
| ENGG615 | ELECTROMAGNETICS ELECTRICAL MACHINES | AND | 3 | 0 | 3 | ENGG611 |
|---------|---|-----|---|---|---|---------|

This course examines the core theory, characteristics, construction operation and application of static and rotating electrical machines. It includes the detailed study and analysis of direct current motors, direct current generators, AC Machines, special machines etc. The course offers a detailed understanding of the application of electromagnetic machines in the field of industry.

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|---------|--|--|---|---|---|---------|
| ENGG627 | LOGIC CIRCUIT, SWITCHING THEORY AND PROGRAMMABLE LOGIC DEVICES | | 3 | 2 | 4 | ENGG534 |
|---------|--|--|---|---|---|---------|

This course provides critical knowledge and understanding of designing digital logic circuits. It covers number systems and conversion, Boolean algebra, algebraic manipulation, applications of Boolean algebra, Karnaugh maps, multi-level gate circuits, multiplexers, decoders, comparators, latches and flip-flops, registers and counters, programmable logic devices. Through laboratory and in-course projects, the students will creatively implement complex applications of digital logic circuits.

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|---------|----------------|--|---|---|---|---------|
| MATH506 | LINEAR ALGEBRA | | 2 | 2 | 3 | MATH504 |
|---------|----------------|--|---|---|---|---------|

This course uses specialist level skills to relate to and adapt main and core theories and concepts in the study of matrices and determinants, and their applications in numerical solutions of systems of linear equations. It also includes important topics such as linear transformations, eigenvalues and eigenvectors, complex vectors and matrices and numerical linear algebra. In the laboratory, MATLAB is used as a mathematical software and solutions to a variety of mathematical problems are determined.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|-------------|--------------------|------------|------------|-----------------|------------------|
| ENGG501 | SAFETY ENGINEERING | 2 | 0 | 2 | ENGG611 |

This course deals with the study of the foundations of safety engineering and applications of safety principles to industrial and commercial systems. It covers topics concerning safety management, occupational health, fire prevention and control, electrical safety and environmental safety. Further, students will learn how to conduct risk analysis and some of the mitigation measures.

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|---------|-----------------------|---|---|---|---------|
| ENGG533 | STRENGTH OF MATERIALS | 3 | 0 | 3 | ENGG521 |
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This course deals with the study of the relationship between externally applied loads and their internal effects on bodies. It covers analysis of the different stresses such as normal, flexural, shear and bearing stress. It also deals with the Hooke's Law analysis, axial deformation, torsion, twisting angles, helical springs, and thin-walled cylinders as well as analysis of shear and moment in beams.

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|---------|-------------------------------------|---|---|---|------------------|
| MECH610 | PNEUMATICS & ELECTRO- PNEUMATICS | 2 | 2 | 3 | ENGG535, ENGG627 |
|---------|-------------------------------------|---|---|---|------------------|

This course introduces the student to the knowledge base and technical skills related to industrial pneumatic and electro-pneumatic systems. Areas of study include pneumatic principles, Symbols and standards in pneumatics, components of a pneumatic system, display of motion sequences and switch states, set-up controls with relays, electrical self-latching switches, memory circuit and speed control of a cylinder, design

of electro-pneumatic system, representation of motion sequences and operating status, and practical application.

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|---------|-----------------|---|---|---|---------|
| ENGG614 | CONTROL SYSTEMS | 2 | 2 | 3 | ENGG611 |
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The course deals with the study of the concepts of control systems. It also covers the discussion of mechanical and electrical modeling using conventional differential equations, reduction rules applied to block-diagram of linear control systems and signal flow graph. Laplace and Inverse Laplace Transformations. Discussion of time-domain response of first and second order control systems, steady-state errors, Routh-Hurwitz Criterion for stability, root locus method, frequency response (bode diagram and polar plot), Nyquist stability criterion, and compensator design techniques. MATLAB is used for analyzing and simulating control systems.

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|---------|-------------------|---|---|---|---------|
| MECH631 | POWER ELECTRONICS | 3 | 2 | 4 | ENGG613 |
|---------|-------------------|---|---|---|---------|

This course covers the power electronics semiconductor switches, Thruster, Triac, GTO and advanced types of power transistor. Triggering devices: UJT, DIAC, and PUT. Types of power conversion: single phase and three phase uncontrolled and controlled rectifiers and their performance. AC voltage regulator, inverters single phase and three phase with PWM techniques.

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|---------|-------------------------------------|---|---|---|--------------------|
| MECH633 | INTRODUCTION TO FUZZY/NEURAL SYSTEM | 3 | 2 | 4 | ENGG627 MATH503 |
|---------|-------------------------------------|---|---|---|--------------------|

This course deals with the core concepts and theories of Artificial Neural Networks (ANN), Perceptron networks, training methodology, and typical application to linearly separable problems, Fuzzy systems, training methods and implementation of ANN and Fuzzy systems for complex industrial applications. Students will also learn to utilize more advanced tools, features, and training methods in implementing intelligent control systems. Higher level software programming will be used for critically analyzing, evaluating, and synthesizing the implemented fuzzy logic and neural networks systems.

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|---------------------------------|------------|------------|-----------------|------------------|
| MATH507 | OPTIMIZATION METHODS | 3 | 0 | 3 | MATH505 |
| The course takes a unified view of optimization and covers the main areas of application of core optimization algorithms. The topics include linear optimization, robust optimization, network flows, dynamic optimization and non-linear optimization. | | | | | |
| MECH621 | LINEAR SYSTEMS | 2 | 2 | 3 | ENGG614 |
| This course deals with detailed knowledge and understanding of theories for linear systems. This module develops a detailed understanding of the fundamentals of linear systems analysis and design using the state space approach. Topics covered include state space representation of systems; solution of state equations; stability analysis using Lyapunov methods; controllability and observability; linear state feedback design; and state observer. MATLAB is used for analyzing and simulating Linear systems. | | | | | |
| MECH623 | HYDRAULICS & ELECTRO-HYDRAULICS | 3 | 2 | 4 | ENGG535, ENGG627 |
| This course deals with the core concepts and physical principles of hydraulics, circuit symbols and components of a hydraulic and Electro-Hydraulics system. It also covers the study of the components of the power supply, Hydraulic Power Generation, control valves, actuators and accessories, and the extended cylinders. Students will also learn to design and implement hydraulic and electro-hydraulic systems for complex industrial applications. Students will critically analyze, evaluate and synthesize the Electrical circuit Design including electrical components and memory Circuit, Time lag relays, Pressure Control, Speed control | | | | | |

valve. Hands-on simulation on advanced industrial applications related to hydraulics and electro hydraulics is conducted for the students using the Festo hydraulics modules.

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|---------|--------------------------------|---|---|---|---------|
| MECH624 | PROGRAMMABLE LOGIC CONTROLLERS | 3 | 2 | 4 | MECH610 |
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The course deals with core concepts and theories of the hardware and software of Programmable logic controllers. This course also deals with programming, connecting, and testing Programmable Logic Controllers (PLCs) for control of complex industrial/commercial processes. It covers sensor interfacing, application of PLCs in some specific Industrial process, and utilization of a hand-held programmer in troubleshooting PLCs. Hands-on simulation is conducted for the students to understand the critical PLC implementation process in industry using advanced tools such as Festo PLC modules and CodeSys software.

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|---------|-------------------------------------|---|---|---|------------------|
| MECH641 | PROCESS INSTRUMENTATION AND CONTROL | 3 | 2 | 4 | ENGG532, ENGG614 |
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This course deals with the core concepts and theories of industrial process control and the instrumentation used for it. It elaborates on various sensors used in the process industry and special emphasis is given on measurement sensors such as Pressure transmitter, Ultrasonic sensors, thermistors and proportional valves. Students will learn the working principle, specifications, design and selection aspects used for sensing complex process parameters, along with merits and limitations of each type of sensor. The course will also build the detailed knowledge of the participants on working principles of control loop components, control strategies, and PID controller fundamentals including terminology, algorithms and advanced methods. A special emphasis on real life implementations, case studies and international standards would ensure students to critically analyze, evaluate and synthesize with their day-to-day practice.

FOURTH YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|-------------|--|---------|---------|--------------|------------------|
| ENGG639 | PROFESSIONAL ETHICS AND ENGINEERING LAWS | 3 | 0 | 3 | ENGG501 |

This course covers topics in the core theories and concepts of ethics, law, contracts, intellectual property, the responsible engineer, moral thinking, risk/safety/liability, employer responsibilities, product liability, and environmental responsibilities. The course deals with several case studies of ethical problems in engineering. It discusses the core concepts of environmental protection and sustainability to understand how they relate to engineering ethics. The course is intended to promote greater reflection by engineers on their activities to better understand the social dimensions of engineering practice. It also provides a historical perspective on society's environmental concerns, and discusses environmental statutes, our regulatory system, approaches to preventing and mitigating environmental problems, and the elements of an effective environmental management system.

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|---------|-----------------|---|---|---|---------|
| MECH639 | MICROCONTROLLER | 2 | 2 | 3 | ENGG627 |
|---------|-----------------|---|---|---|---------|

This course provides critical knowledge and understanding of microcontroller-based systems design, development and implementation. It includes embedded system types, microcontroller architecture, programming, digital and analog I/O interfacing, task scheduling, interrupt and timers management, and communication interfaces. Through laboratory and in-course projects, the students will creatively implement complex applications of microcontroller-based systems.

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|---------|----------------|---|---|---|---------|
| MECH642 | MACHINE VISION | 3 | 2 | 4 | MECH621 |
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This course discusses core theories, principles and concepts of machine vision devices and techniques and

learns about computer vision systems and digital image processing. It also relates to fundamental issues and techniques of computer vision and image processing. Emphasis will be on physical, mathematical, image-processing, pattern recognition, and feature extraction aspects of vision. The course will have a proper lab activity to enable students to understand the breadth and depth of the lecturing materials. The main topics will be as: Machine vision concepts, Image acquisition, Lighting, Image formation, Image conversion, Image processing and analysis. Image enhancement, Edge detection and Image segmentation.

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|---------|--|---|---|---|------------------|
| MECH643 | ROBOT KINEMATICS, DYNAMICS AND CONTROL | 3 | 2 | 4 | MECH631, MECH621 |
|---------|--|---|---|---|------------------|

This course facilitates the core learning and understanding of robot manipulators for students to understand complex design and applications of robots in industrial application. Successful completion allows students to formulate the kinematics and dynamic modelling of robotic manipulators consisting of a serial chain of rigid bodies and to implement control algorithms with sensory feedback during the lab sessions. Students will gain specialist skills in dealing with complex control architecture and manipulator structure typical to new-generation robots.

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|---------|---------------------------|---|---|---|---------|
| MECH644 | MODULAR PRODUCTION SYSTEM | 3 | 2 | 4 | MECH624 |
|---------|---------------------------|---|---|---|---------|

This course integrates core theories of mechanical design, computer control and electronic components in designing an Industrial automation system. Students will be provided with the detailed knowledge and understanding on various automation strategies, automation layouts, material handling devices used in assembly lines, automated assembly lines and computer integrated manufacturing. It discusses the step by step manner of designing, assembling, and programming a modular station based on the given system requirement. The laboratory uses Codesys software for PLC programming and advanced FESTO educational modules in simulating processes in the modular production system.

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|-------------|------------------------------------|---------|---------|--------------|------------------|
| ENGG638 | ENGINEERING AND PROJECT MANAGEMENT | 3 | 0 | 3 | ENGG522 |

This course provides critical knowledge and understanding of project management and the essential tools needed to deliver successful projects on time and on budget from the standpoint of the manager, who must skillfully organize, plan, implement and control non-routine activities to achieve schedule, budget and performance activities. Topics include project life cycles, principles and concepts of strategic management process in project selection and organization, planning, budgeting and scheduling systems. It also covers planning and control methods such as PERT- CPM, Gantt Charts, earned value techniques, project audits, and risk management to critically evaluate various project management situations.

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|---------|-----------------------|---|---|---|---------|
| MECH651 | INDUSTRIAL ATTACHMENT | 0 | 6 | 6 | MECH644 |
|---------|-----------------------|---|---|---|---------|

This 6-unit course is a practicum course where the students are exposed to an actual work environment. The students are required to complete 240 hours of on-site training. They are sent to work environments under the supervision of a practicum professor. Moreover, the students submit a report and a performance evaluation made by the on- site supervisor.

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|---------|---|---|---|---|--------------------------------|
| MECH652 | MECHATRONICS ENGINEERING DESIGN PROJECT A | 0 | 6 | 3 | Completion of 162 Credit Units |
|---------|---|---|---|---|--------------------------------|

This is the first of two courses in Mechatronics Engineering design sequence which prepares students for engineering practice through a culminating major design experience or capstone based on the knowledge and skills acquired in foundation and core courses and incorporating appropriate engineering standards (IEEE, ISO) as an integral part and with due consideration of multiple realistic constraints tradeoffs.

This is a group supervised design project in which students analyze, specify, design, construct, evaluate and adapt physical computing in various applications such as in smart environments and embedded systems. They also incorporate design standards and make decision as a result of multiple design tradeoff/constraints (economics, environmental, social, political, ethical, health and safety, manufacturability, and sustainability) analysis and evaluation as part of the design process.

THIRD TRIMSTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|--|--|------------|------------|-----------------|------------------|
| MECH645 | TECHNOPRENEURSHIP | 3 | 0 | 3 | ENGG638 |
| <p>The course deals with the study of entrepreneurship in IT industry by applying the core theories and principles of entrepreneurship and management in IT business. The course covers types of entrepreneurships, legal factors related to the project like Business act, company act, technology act and Industrial act, developing a business plan by integrating business proposal writing skill, software skills, innovation and creativity skills. It also covers advanced level topics like risk management, configuration management and quality management.</p> | | | | | |
| MECH661 | MECHATRONICS ENGINEERING DESIGN PROJECT B | 0 | 6 | 3 | MECH652 |
| <p>This course is a continuation of Mechatronics Engineering Design A (MECH652) which enables students to design a system, component, or process to meet desired needs within realistic constraints through a culminating major design experience or capstone based on the knowledge and skills acquired in foundation and core courses and incorporating appropriate engineering standards (IEEE, ISO) as an integral part and with due consideration of multiple realistic constraints tradeoffs.</p> <p>This is a group supervised design project in which students analyze, specify, design, construct, evaluate and adapt physical computing applications in smart environments and embedded systems. They also incorporate design standards and make decisions as a result of multiple design tradeoff/constraints (economics, environmental, social, political, ethical, health and safety, manufacturability, and sustainability) analysis and evaluation as part of the design process.</p> | | | | | |
| MECH653A | DATA COMMUNICATION AND NETWORKING 2 (Elective) | 2 | 2 | 3 | CENG611 |
| <p>This course provides an in-depth and advanced discussion of routing technology. It integrates the core theories, concepts, functions and operations of a router including the principles and applications of routing protocols. Topics include router components and configuration; Unicast and Multicast routing protocols: RIPv1, RIPv2, EIGRP, OSPF and BGP; VLSM and IPv6. The students make use of a range of approaches including the Packet Tracer, GNS3 and the actual network devices in the laboratory in performing advanced and complex network configurations using the different routing protocols and in the critical analysis of network requirements, issues and/or problems.</p> | | | | | |
| MECH653C | SYSTEM MODELING AND SIMULATION (Elective) | 2 | 2 | 3 | ENGG614 |
| <p>This course examines core theories and principles of engineering system modeling and simulation methods, as well as numerical and computer-based solution techniques utilized in industrial and engineering environments. Techniques for finding solutions to these systems include graphical, algebraic, numerical, state space, simulation and computational processes. Case studies in industry and engineering applications are used to illustrate the techniques and modeling concepts. Examples of simulation and analysis methods will be related to the linear and non-linear, deterministic and non-deterministic systems.</p> | | | | | |
| MECH653D | DIGITAL CONTROL SYSTEMS (Elective) | 2 | 2 | 3 | ENGG614 |

Introduction to Digital Control, Discrete-Time Systems (Difference equations, The z-transform, z-Transform solution of difference equations, The time response of a discrete-time system, The modified z-transform, The sampling theorem), Modeling of Digital Control Systems, Stability of Digital Control Systems, Digital Control System Design (z-Domain root locus, Digital implementation of analog controller design, Direct z-domain digital controller design, Frequency response design, Direct control design), Discrete-time State-Space Representation, The solution of linear state-space equations, The transfer function matrix, Stability of state-space realizations, Controllability and stabilizability, Observability and detectability, Detectability, State-space realizations, State Feedback Control, Pole placement, State estimation, Observer state feedback, Optimal control, The linear quadratic regulator.

| | | | | | |
|----------|------------------------------------|---|---|---|---------|
| MECH662A | WIRELESS COMMUNICATIONS (Elective) | 2 | 2 | 3 | CENG611 |
|----------|------------------------------------|---|---|---|---------|

This course aims to develop the core knowledge of communications theories and their applications in digital communications. The course covers the structure of the digital communication systems, analog modulation technique, digital modulation techniques, probability of error in digital communication system, multiple access techniques, channels and source encoding, mobile communication systems

| | | | | | |
|----------|--------------------------------------|---|---|---|---------|
| MECH662C | DIGITAL SIGNAL PROCESSING (Elective) | 2 | 2 | 3 | MECH639 |
|----------|--------------------------------------|---|---|---|---------|

The course deals with the detailed study of the core theories, principles and concepts of digital signal processing; discrete convolution; Z-transform; sampled data system; digital filters; discrete Fourier transforms; fast Fourier transforms. DSP Applications. Introduction of 2-D signal (image) processing. This course is designed to provide students with a comprehensive treatment of the important issues in design, implementation and applications of digital signal processing theory and algorithm. Further, computer simulation exercises are intended to familiarize the student with implementation aspects and the application of theoretical knowledge to practical problems.

| | | | | | |
|----------|------------------------|---|---|---|---------|
| MECH662D | POWER PLANT (Elective) | 2 | 2 | 3 | ENGG532 |
|----------|------------------------|---|---|---|---------|

The course deals with the major systems and components practice related to power plant to generate electrical power such as Boiler, Turbine, Condenser and pumps. The topics covered are thermodynamic cycles; ranking cycle modified Rankin cycle with re-heater and feed water heater, also steam, gas and combined cycle power plant are covered. This course required the student to integrate all these topics to analyze and design the deferent type of power plant systems and components.

| | |
|---|---|
| 1. Teaching Institution | University of Technology Bahrain (UTB) |
| 2. University Department | College of Engineering (COE) |
| 3. Programme Title | Bachelor of Science in Mechatronics Engineering (BSME) |
| 4. Title of Final Award | Bachelor of Science in Mechatronics Engineering (BSME) |
| 5. Attendance Mode | Actual classroom learning-interactive (Full-time) |
| 6. Delivery Mode | On-campus (Traditional Learning) |
| 7. National Qualification Framework Level and Credit | NQF Level 8 540 NQF Credits (180 ACS Credits) |
| 8. Accreditation | ABET, Engineering Accreditation Commission (EAC) |
| 9. Other external influences | Local External Influences/References <ul style="list-style-type: none"> - Ministry of Education (MOE) - Higher Education Council (HEC) - Education and Training Quality Authority (BQA) International External Influences/References <ul style="list-style-type: none"> - Accreditation Board for Engineering and Technology (ABET) |
| 10. Date of production/revision of this specification | September 2025 |
| 11. Aims of the Programme | |
| <p>The Bachelor of Science in Mechatronics Engineering is an interdisciplinary engineering programme that combines knowledge and skills in mechanical, electrical, and computer control systems, as well as engineering design and management. The core courses include mechanical design, sensors and actuators, control theory, robotics, automation and embedded systems. Students on this programme will learn to combine different systems to develop a solution for a real-world problem, or design and build an intelligent, programmable and integrated system.</p> <p>Graduates of the programme, three (3) to five (5) years after graduation shall be able to:</p> <ol style="list-style-type: none"> 1. Pursue careers in Mechatronics Engineering or related fields towards the improvement of engineering practice; 2. Engage in lifelong learning toward completion of advanced/continuing education or other learning opportunities; and 3. Demonstrate professional success through strengthened networks and/or positions of increasing social responsibility. | |
| 12. Programme Intended Learning Outcomes | |
| <p>Upon successful completion of the programme, the student will be able to:</p> <ol style="list-style-type: none"> 1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics 2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors 3. Communicate effectively with a range of audiences 4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts 5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives 6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering | |

judgment to draw conclusions

7. Acquire and apply new knowledge as needed, using appropriate learning strategies

Teaching and Learning Methods

Active and Engaged Learning. Students are required to attend the sessions regularly. Students learn by doing, making, writing, designing, creating, and solving. Active participation of the students during discussion is expected. Learning is an active process, and as such, students must engage with the course materials, i.e. reading the textbook and other assigned advanced readings.

Problem-based learning. After each topic, sample problems will be provided to students. Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem.

Project Based Learning: Students engage in learning essential knowledge and skills through an extended, student-driven inquiry process structured around complex, authentic questions and carefully designed projects and tasks.

Collaborative learning. Students will be divided into groups with at least three (3) members and each group will be provided with problems or projects that they will work on together to search for understanding, meaning, or solutions. Each group is expected to work together in solving particular engineering problems, discuss the algorithm of the problems, and present the solution in class.

Discovery-based learning. During laboratory hours, students will be given experiments to work in groups where they can apply the theories and principles learned. This is an opportunity to have hands-on experience and maximize their learning through actual simulation.

Assessment Methods

Assessment is done independently for each course. Variety of assessment tools will be used to assess achievement of intended learning outcomes including but not limited to: written examinations, assignments, case analysis, Laboratory reports, Simulations, presentations, projects and capstone.

13. Programme Structure**BACHELOR OF SCIENCE IN MECHATRONICS ENGINEERING (BSME)**

CURRICULUM PLAN EFFECTIVE AY 2025-2026

Foundation Courses

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITES |
|-------------|---------------------------|---------|---------|--------------|----------------|
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|--------------------------------|-------|-----|--------|----------------|
| | | Hrs | Hrs | Units | |
| ARAB600 | Arabic Language | 3 | 0 | 3 | |
| CHEM611 | General Chemistry | 2 | 2 | 3 | |
| ENGG610 | Introduction to Engineering | 2 | 2 | 3 | |
| ENGL611 | English Communication Skills 1 | 3 | 0 | 3 | |
| EUTH500 | Euthenics | 1 | 0 | 0 | |
| SCIE631 | Biology | 2 | 2 | 3 | |
| MATH633 | Calculus 1 | 3 | 0 | 3 | |
| | | TOTAL | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|-----------------------------------|-------|-----|--------|----------------|
| | | Hrs | Hrs | Units | |
| CSCI601 | Programming for Engineers | 2 | 2 | 3 | |
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
| HIST600 | History of Bahrain and GCC Region | 3 | 0 | 3 | |
| MATH713 | Calculus 2 | 3 | 0 | 3 | MATH633 |
| PHYS631 | University Physics 1 | 2 | 2 | 3 | MATH633 |
| ENGG711 | Engineering Drawing | 2 | 2 | 3 | |
| | | TOTAL | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|----------------------------|-----|-----|--------|------------------|
| | | Hrs | Hrs | Units | |
| CSCI627 | Computer Programming 1 | 2 | 2 | 3 | CSCI601 |
| ENGG724 | Thermodynamics | 3 | 0 | 3 | PHYS631 |
| HUMR600 | Human Rights | 3 | 0 | 3 | |
| MATH621 | Probability and Statistics | 3 | 0 | 3 | |
| ENVS711 | Environmental Science | 3 | 0 | 3 | SCIE631 |
| PHYS711 | University Physics 2 | 2 | 2 | 3 | PHYS631, MATH713 |

College/Department: College of Engineering

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| | | | | |
|--|--|-------|----|--|
| | | TOTAL | 18 | |
|--|--|-------|----|--|

SECOND YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|---------------------------|-------|-----|--------|----------------|
| | | Hrs | Hrs | Units | |
| ENGG726 | Heat Transfer | 3 | 0 | 3 | ENGG724 |
| ENGL712 | Technical Communication | 3 | 0 | 3 | ENGL621 |
| ENGG720 | Engineering Materials | 3 | 0 | 3 | CHEM611 |
| MATH731 | Multivariate Calculus | 2 | 2 | 3 | MATH713 |
| MATH722 | Advanced Mathematics | 2 | 2 | 3 | MATH713 |
| ENGG721 | Electric Circuit Theory 1 | 2 | 2 | 3 | PHYS711 |
| | | TOTAL | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|--------------------------------|-------|-----|--------|----------------|
| | | Hrs | Hrs | Units | |
| PHYS722 | University Physics 3 | 2 | 2 | 3 | PHYS711 |
| ENGG725 | Engineering Mechanics | 3 | 0 | 3 | PHYS631 |
| ENGG731 | Electronics 1 | 2 | 2 | 3 | ENGG721 |
| ENGG732 | Electric Circuit Theory 2 | 2 | 2 | 3 | ENGG721 |
| MATH732 | Numerical Methods and Analysis | 2 | 2 | 3 | MATH731 |
| MATH733 | Linear Algebra | 2 | 2 | 3 | MATH731 |
| | | TOTAL | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|------------------------|-------|-----|--------|----------------|
| | | Hrs | Hrs | Units | |
| ENGG733 | Engineering Economy | 3 | 0 | 3 | MATH621 |
| ENGG815 | Fluid Mechanics | 2 | 2 | 3 | ENGG725 |
| ENGG812 | Electronics 2 | 2 | 2 | 3 | ENGG731 |
| ENGG816 | Electrical Machines | 3 | 0 | 3 | ENGG732 |
| ENGG813 | Digital Logic Design | 2 | 2 | 3 | ENGG731 |
| MATH734 | Differential Equations | 3 | 0 | 3 | MATH731 |
| | | TOTAL | | 18 | |

THIRD YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|-----------------------------------|-------|-----|--------|------------------|
| | | Hrs | Hrs | Units | |
| MECH812 | Hydraulics and Electro-hydraulics | 2 | 2 | 3 | ENGG815, ENGG813 |
| IENF811 | Computer Networks 1 | 2 | 2 | 3 | PHYS631 |
| MECH811 | Pneumatics and Electro-Pneumatics | 2 | 2 | 3 | ENGG815, ENGG813 |
| ENGG821 | Control Systems | 2 | 2 | 3 | ENGG732 |
| MATH821 | Optimization Methods | 3 | 0 | 3 | MATH732 |
| ENGG822 | Safety Engineering | 3 | 0 | 3 | ENGG733 |
| | | TOTAL | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|------------------------------------|-------|-----|--------|------------------|
| | | Hrs | Hrs | Units | |
| MECH821 | Intelligent Control | 2 | 2 | 3 | ENGG813, MATH821 |
| MECH822 | Modern Control System | 2 | 2 | 3 | ENGG821 |
| ENGG831 | Engineering and Project Management | 3 | 0 | 3 | ENGG733 |
| MECH823 | Programmable Logic Controllers | 2 | 2 | 3 | MECH811 |
| MECH824 | Power Electronics | 2 | 2 | 3 | ENGG812 |
| MECH825 | Embedded Systems | 2 | 2 | 3 | ENGG813 |
| | | TOTAL | | 18 | |

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-----------------|--|-------|-----|--------|------------------|
| | | Hrs | Hrs | Units | |
| MECH831 | Machine Vision | 2 | 2 | 3 | MECH822 |
| MECH832 | Process Instrumentation and Control | 2 | 2 | 3 | ENGG726, ENGG821 |
| MECH833 | Robotics | 2 | 2 | 3 | MECH824, MECH822 |
| ENTR801 | Technopreneurship | 3 | 0 | 3 | ENGG831 |
| ENGG851 | Professional Ethics and Engineering Laws | 3 | 0 | 3 | ENGG831 |
| See Lists Below | Major Elective 1 | 2 | 2 | 3 | MECH825 |
| | | TOTAL | | 18 | |

FOURTH YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-----------------|---|-------|-----|--------|-----------------------------------|
| | | Hrs | Hrs | Units | |
| See Lists Below | Major Elective 2 | 2 | 2 | 3 | MECH825 |
| See Lists Below | Major Elective 3 | 3 | 0 | 3 | MECH833 |
| MECH841 | Industrial Automation | 2 | 2 | 3 | MECH823 |
| MECH842 | Mechatronics Engineering Design Project A | 0 | 6 | 3 | On Completion of 144 credit units |
| | | TOTAL | | 12 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|---|-------|-----|--------|----------------|
| | | Hrs | Hrs | Units | |
| MECH843 | Industrial Attachment | 0 | 3 | 3 | MECH833 |
| MECH844 | Mechatronics Engineering Design Project B | 3 | 0 | 3 | MECH842 |
| | | TOTAL | | 6 | |

ELECTIVE COURSES*MAJOR ELECTIVE 1 (Student must choose 1 course)*

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PRE-REQUISITES |
|-------------|--------------------------------|-----|-----|--------|----------------|
| | | Hrs | Hrs | Units | |
| MECH851 | Artificial Intelligence | 2 | 2 | 3 | MECH825 |
| MECH862 | System Modeling and Simulation | 2 | 2 | 3 | MECH825 |
| MECH853 | Digital Control Systems | 2 | 2 | 3 | MECH825 |

MAJOR ELECTIVE 2 (Student must choose 1 course)

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PREREQUISITE/S |
|-------------|---------------------------|-----|-----|--------|----------------|
| | | Hrs | Hrs | Units | |
| MECH861 | Wireless Communications | 2 | 2 | 3 | MECH825 |
| MECH866 | Digital Signal Processing | 2 | 2 | 3 | MECH825 |
| IENF821 | Computer Networks 2 | 2 | 2 | 3 | MECH825 |

MAJOR ELECTIVE 3 (Student must choose 1 course)

| COURSE CODE | COURSE TITLE | LEC | LAB | CREDIT | PREREQUISITE/S |
|-------------|--|-----|-----|--------|----------------|
| | | Hrs | Hrs | Units | |
| MECH863 | Special Topics in Mechatronics Engineering | 3 | 0 | 3 | MECH833 |
| MECH864 | Smart Manufacturing | 3 | 0 | 3 | MECH833 |
| MECH865 | Power Plant | 2 | 2 | 3 | MECH833 |

14. Awards and Credits

| | |
|-----------------------------|---|
| Degree/ Certificate Awarded | Bachelor of Science in Mechatronics Engineering |
| Total Units for Degree | 180 |
| Total Trimesters Completed | 11 |

15. Admission Criteria**Admissions Criteria for Undergraduate Students****A. For First Year Undergraduate Applicants**

Acceptance to the University depends on the following admissions requirements:

1. Completely filled out an admission application form.
2. Minimum secondary school scores 60% or its equivalent.
3. Online Placement test (Oxford Online Placement Test (OOPT)) Result (if needed)
4. Submission of all required documents stated in the Admissions Policy.

To be admitted to any undergraduate programme, the applicant must satisfy the minimum secondary school grades or its equivalent without the need to take the remediation classes of English and Math, as shown in the following table:

| Subtest Component for Bahraini, KSA, Kuwait, Qatar, Yemen, Switzerland, USA, and Ecuador Qualification | | Programme |
|---|----------------------------------|-------------------|
| | | BSME |
| Mathematics | Science/ Technical/General Track | At least 70% or C |
| | Commercial Track | At least 80% or B |
| | Literature and Islamic Tracks | At least 80% or B |
| Science | - | 60 |
| English | - | At least 80 or B |

*This is applicable to Bahraini and similarly equivalent qualification

7. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program.

| Subtest Component for Other Qualification (Indian, Pakistan, and West African) | | Programme |
|---|----------------------------------|-------------------|
| | | BSME |
| Mathematics | Science/ Technical/General Track | At least 51 or C1 |
| | Commercial Track | At least 71 or B1 |
| | Literature and Islamic Tracks | At least 71 or B1 |
| Science | - | 60 |
| English | - | At least 71 or B1 |

*Note: Science component is subject to the evaluation of the Dean.

For the undergraduate applicant who did not meet the minimum required secondary school grades in Mathematics and English or its equivalent, his/her admissions depend on the following criteria:

| <i>Programme</i> | <i>Secondary School Grade</i> | <i>Placement Test in English (OOPT)</i> | <i>Remarks</i> |
|------------------|--|---|---|
| All Programmes | 60-79 % grade in English | Score \geq 51 % | No need for Foundation Course in English |
| | | Score < 51 % | Foundation Course in English |
| BSME | For Commercial Track: Score 50-79% in Math. For Scientific, General, and technical Track: Score 50-69% in Math. | N/A | Foundation Course in Math |
| | For Science score <60% | N/A | Tutorial class in general sciences |
| All Programmes | CGPA <60% for Bahraini and KSA. CGPA <41% for Indian and Pakistan. | N/A | Will be subjected to 5% admission rule of UTB (As explained under note) |

*This is applicable to Bahraini and similarly equivalent qualification

a. Secondary Grade in English

A qualified applicant for all programmes whose secondary school grade in English is within 60-79%, needs to take the placement test in English (OOPT). If the OOPT test result is 51 or above, applicant will not take remediation course in English. However, if the result is lower than 51, applicant will take remediation course in English.

b. Private school

Private school graduates with English as their medium of instruction are eligible for the exemption from the foundation program (English Foundation).

c. IELTS/TOEFL

Applicants who submit official IELTS or TOEFL certificates issued by accredited examination centers, with a minimum score of 450 on the TOEFL (paper-based), 131 on the TOEFL (computer-based), or 5.0 on the IELTS, are exempted from taking the required English Placement Test.

In addition, applicants who obtain an IELTS score of 5.5 or higher or a TOEFL score that meets the equivalent standard may qualify for English course exemptions based on their results. This policy recognizes academic achievement by allowing eligible students to be exempted from enrolling in introductory English courses upon admission.

| IELTS/TOEFL Scores | Exemption |
|---|---|
| Qualified applicants with 5.5 IELTS scores or TOEFL: 496 (paper-based) or 169 (computer based) | Satisfying this requirement means to be exempted from taking: ENGL401/ENGL611 (English Communication Skills 1) |

Qualified applicants with 6.0 IELTS scores or TOEFL: 546 (paper-based) or 211 (computer based)

Satisfying this requirement means to be exempted from taking:
ENGL401/ENGL611 and ENGL402/ENGL621
(English Communication Skills 1 and 2)

d. Secondary Grade in Math

A qualified applicant for BSME, BSEnE, BSIT, BSBI, and BSAF programmes who has a secondary grade score in Math of 50-79% for commercial track and 50-69% for scientific and technical tracks and lower than 60% for the BSIB programme must take the remediation course in Math. All qualified applicants for BSCS and BSIE programmes coming from the literature and Islamic tracks must take the remediation course in Math.

e. Secondary Grade in Science

A qualified applicant for BSME, BSIE, BSEnE, BSCS, BSIT, BSBI, and BSAF programmes who has a secondary grade score in science of lower than 60% must take tutorial class in general science before taking any university-level science course.

Note: UTB can accept new students equivalent to 5% of the total enrollment where student applicant has a CGPA below 60% but not lower than 50% from Bahraini Schools; below 41% but not lower than 33% from Indian and Pakistan Schools; and for other non-Bahrain based Schools, it will be based on the passing mark of the school. 5% is subject to strict evaluation by the dean and the applicant's score in the OOPT and the secondary school grades.

B. For Undergraduate Transfer Student Applicants

Application Requirements:

1. Completely filled out an admission application form
2. Official Transcript of Records (TOR) from the university previously attended. Rules and regulations of the HEC-Bahrain regarding the authentication of foreign certificates and private school certificates are to be applied when necessary.
3. Course description of all completed courses for which transfer credit is sought (authenticated by the originating university)
4. Certificate of Transfer from the university previously attended stamped by MOE, if any.
5. Withdrawal Certificate stamped by MOE
6. Submission of all required documents stated in the admissions policy.

Admissions Requirements:

1. For Bahrain and KSA qualifications, the applicant should have at least a secondary school average of 60%. For non-Bahrain secondary qualifications (Indian and Pakistan) the applicant should have at least 41% secondary school average; and for other non-Bahraini qualifications please refer to the table of cut-off.
2. If the applicant has taken and passed courses in English and Mathematics in the previous university, the applicant will be exempted in taking the remedial courses in both English and Mathematics. The applicant may proceed to mainstream university courses and is eligible to apply for credit transfer.
3. If the applicant has not taken any course in English and Mathematics, the basis for evaluation whether remedial course in English and mathematics is required or not is the subject scores in his/her last year in the secondary school certificate using the table presented earlier.

The transfer of course credits is accepted at UTB provided that courses applied for crediting are equivalent to the courses where credit will be transferred. Practicum (Internship) course is eligible for credit transfer with the same practicum (internship) course from another university or re-admitted student from UTB.

The University requires the undergraduate student to complete at least 50% of the required credit units/hours of a programme in residence at UTB. The maximum credit units/hours that are eligible for transfer credits should not exceed two-thirds (66%) of the required credit units/hours based on his/her original degree from another university.

16. CGPA Requirement for Graduation

The required CGPA for an undergraduate student to be eligible for graduation is 2.0 out of 4.

17. Career Pathways

The BSME graduates can pursue a career as automation engineer, production engineer, instrumentation & control engineer, production/manufacturing supervisor, PLC programmer, design engineer, vocational instructor/trainer, laboratory engineer, maintenance supervisor, or sales engineer. In addition, the programme can lead graduates for postgraduate degrees in engineering.

18. BSME (AY2025-2026) CURRICULUM SKILLS MAPPING

| Year / Level | Course Code | Course Title | Core (C) or Option (O) | Programme Learning Outcomes / Student Outcomes | | | | | | |
|----------------|-------------|-----------------------------------|------------------------|--|-----|-----|-----|-----|-----|-----|
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| Year 1 1st Tri | ARAB600 | Arabic Language | (C) | | | / | | | | |
| | CHEM611 | General Chemistry | (C) | / | | / | | / | / | |
| | ENGG610 | Introduction to Engineering | (C) | / | / | / | | / | / | |
| | ENGL611 | English Communication Skills 1 | (C) | | | / | | | | |
| | EUTH500 | Euthenics | (C) | | | | | | | |
| | SCIE631 | Biology | (C) | / | | | | / | / | |
| | MATH633 | Calculus 1 | (C) | / | | | | | | |
| Year 1 2nd Tri | CSCI601 | Programming for Engineers | (C) | / | / | / | | / | / | |
| | ENGL621 | English Communication Skills 2 | (C) | | | / | | | | |
| | HIST600 | History of Bahrain and GCC Region | (C) | | | | / | | | |
| | MATH713 | Calculus 2 | (C) | / | | | | | | |
| | PHYS631 | University Physics 1 | (C) | / | | / | | / | / | |
| | ENGG711 | Engineering Drawing | (C) | / | | / | | / | | / |
| Year | CSCI627 | Computer Programming | (C) | / | | | | / | / | |

College/Department: College of Engineering

BSME PROGRAMME SPECIFICATIONS AY2025-2026

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18. BSME (AY2025-2026) CURRICULUM SKILLS MAPPING

| Year / Level | Course Code | Course Title | Core (C) or Option (O) | Programme Learning Outcomes / Student Outcomes | | | | | | |
|-----------------------------------|-------------|-----------------------------------|------------------------|--|-----|-----|-----|-----|-----|-----|
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| 1 3rd Tri | | 1 | | | | | | | | |
| | ENGG724 | Thermodynamics | (C) | / | | | | | | / |
| | HUMR600 | Human Rights | (C) | | | | / | | | |
| | MATH621 | Probability and Statistics | (C) | / | | | | | | |
| | ENVS711 | Environmental Science | (C) | | | | / | | | |
| | PHYS711 | University Physics 2 | (C) | / | | / | | / | / | |
| Year 2 1st Tri | ENGG726 | Heat Transfer | (C) | / | | | | | | / |
| | ENGL712 | Technical Communication | (C) | | | / | | | | |
| | ENGG720 | Engineering Materials | (C) | / | | | | | | |
| | MATH731 | Multivariate Calculus | (C) | / | | | | / | / | / |
| | MATH722 | Advanced Mathematics | (C) | / | | | | / | / | / |
| | ENGG721 | Electric Circuit Theory 1 | (C) | / | / | / | | / | / | |
| Year 2 2nd Tri | PHYS722 | University Physics 3 | (C) | / | | / | | / | / | |
| | ENGG725 | Engineering Mechanics | (C) | / | | | | | | |
| | ENGG731 | Electronics 1 | (C) | / | / | / | | / | / | |
| | ENGG732 | Electric Circuit Theory 2 | (C) | / | / | / | | / | / | / |
| | MATH732 | Numerical Methods and Analysis | (C) | / | | | | / | / | / |
| | MATH733 | Linear Algebra | (C) | / | | | | / | / | / |
| Year 2 3rd Tri | ENGG733 | Engineering Economy | (C) | / | | | / | | | |
| | ENGG815 | Fluid Mechanics | (C) | / | | | | | | / |
| | ENGG812 | Electronics 2 | (C) | / | / | / | | / | / | / |
| | ENGG816 | Electrical Machines | (C) | / | | | | | | / |
| | ENGG813 | Digital Logic Design | (C) | / | / | / | | / | / | |
| | MATH734 | Differential Equation | (C) | / | | / | | | | |
| Year 3 1st Tri | MECH812 | Hydraulics and Electro-hydraulic | (C) | / | / | / | | / | / | / |
| | IENF811 | Computer Networks 1 | (C) | / | / | / | | / | / | / |
| | MECH811 | Pneumatics and Electro-Pneumatics | (C) | / | / | / | | / | / | / |
| | ENGG821 | Control Systems | (C) | / | / | | | | / | / |
| | MATH821 | Optimization Methods | (C) | / | | | | | | |

18. BSME (AY2025-2026) CURRICULUM SKILLS MAPPING

| Year / Level | Course Code | Course Title | Core (C) or Option (O) | Programme Learning Outcomes / Student Outcomes | | | | | | |
|-------------------|-------------|--|------------------------|--|-----|-----|-----|-----|-----|-----|
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| | ENGG822 | Safety Engineering | (C) | | | | / | | | |
| Year 3 2nd Tri | MECH821 | Intelligent Control | (C) | / | / | / | | / | / | / |
| | MECH822 | Modern Control System | (C) | / | / | / | | / | / | / |
| | ENGG831 | Engineering and Project Management | (C) | / | | | / | / | | |
| | MECH823 | Programmable Logic Controllers | (C) | / | / | / | | / | / | / |
| | MECH824 | Power Electronics | (C) | / | / | / | | / | / | / |
| | MECH825 | Embedded Systems | | / | / | / | | / | / | / |
| Year 3 3rd Tri | MECH831 | Machine Vision | (C) | / | / | / | | / | / | / |
| | MECH832 | Process Instrumentation and Control | (C) | / | / | / | | / | / | / |
| | MECH833 | Robotics | (C) | / | / | / | | / | / | / |
| | ENTR801 | Technopreneurship | (C) | / | / | / | | | / | / |
| | ENGG851 | Professional Ethics and Engineering Laws | (C) | | | | / | | | |
| | MECH851 | Major Elective 1: Artificial Intelligence | (O) | / | / | / | | | / | / |
| | MECH862 | Major Elective 1: System Modeling and Simulation | (O) | / | / | / | | | / | / |
| | MECH853 | Major Elective 1: Digital Control Systems | (O) | / | / | / | | | / | / |
| Year 4 1st Tri | MECH861 | Major Elective 2: Wireless Communications | (O) | / | / | / | | / | / | / |
| | MECH866 | Major Elective 2: Digital Signal Processing | (O) | / | / | / | | / | / | / |
| | IENF821 | Computer Network 2 | (O) | / | / | / | | / | / | / |
| | MECH863 | Major Elective 3: Special Topics in Mechatronics Engineering | (O) | / | | / | | / | | |
| | MECH864 | Major Elective 3: Smart Manufacturing | (O) | / | | / | | / | | |
| | MECH865 | Major Elective 3: Power Plant | (O) | / | | / | | / | | |

18. BSME (AY2025-2026) CURRICULUM SKILLS MAPPING

| Year / Level | Course Code | Course Title | Core (C) or Option (O) | Programme Learning Outcomes / Student Outcomes | | | | | | |
|---------------------------|-------------|---|------------------------|--|-----|-----|-----|-----|-----|-----|
| | | | | SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| | MECH841 | Industrial Automation | (C) | / | / | / | | / | / | / |
| | MECH842 | Mechatronics Engineering Design Project A | (C) | / | / | / | / | / | / | / |
| Year 4 2nd Tri | MECH843 | Industrial Attachment | (C) | / | / | / | / | / | | / |
| | MECH844 | Mechatronics Engineering Design Project B | (C) | / | / | / | / | / | / | / |

BACHELOR OF SCIENCE IN MECHATRONICS ENGINEERING (BSME)
CURRICULUM PLAN EFFECTIVE AY2025-2026

COURSES DESCRIPTION**FOUNDATION COURSES**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT UNITS | PRE-REQUISITE(S) |
|---|---------------------------|---------|---------|--------------|------------------|
| MATH500 | Remedial Mathematics | 3 | 0 | 0 | |
| This course is a foundation in mathematics focusing on the building of the knowledge and skills and understanding to solve problems in college algebra and trigonometry. It deals with the topics on equations and Inequalities; functions and graphs; polynomial and rational Functions; exponential and logarithmic functions; trigonometric functions; trigonometric identities and equations; application of trigonometry; systems of equations and inequalities; and matrices. It also includes the application of the mathematical thinking process. | | | | | |
| ENGL500 | English Foundation Course | 12 | 0 | 0 | |
| ENGL500 is a required foundation course for entering students whose English language skills need further improvement and enhancement to be able to cope with the university's academic courses. This course introduces the students to the English language where they get involved and engaged in the learning process. It utilizes an integrated approach in developing the students' English macro communication skills in speaking, listening, grammar, and vocabulary in one phase (preintermediate) which will serve as the benchmark for the next level first year English course. Furthermore, the course intensifies its intended learning objectives with the comprehensive utilization of audio-lingual presentations, includes information related to dictionary use, basic grammar rules, daily use vocabulary words through a variety of contexts, written responses, writing structures, settings of writing, and the process of forming written and spoken communications. Hence, the students are expected to gain more knowledge to communicate effectively in English. | | | | | |

FIRST YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC HRS | LAB HRS | CREDIT UNITS | PRE-REQUISITE(S) |
|---|------------------------------|------------|------------|-----------------|------------------|
| ARAB600 | Arabic Language | 3 | 0 | 3 | |
| <p>على دراسة أساسيات اللغة العربية كقراءة وتحليل و نقد وبيان خصائص النصوص المطلوبة التي ARAB600 ركز مقرر تتناول مختلف الأجناس الأدبية نثراً وشعراً. كما يركز هذا المقرر على دراسة وفهم وتطبيق القواعد النحوية والأساليب الصرفية الأساسية في اللغة العربية مع مراعاة مهارات الكتابة الإملائية الصحيحة.</p> <p>The ARAB400A/ARAB600 course focuses on the fundamentals of Arabic language, such as reading, analyzing, and critique. It explains the characteristics of the required texts, which deal with different literary genres, prose, and poetry. The course also focuses on the understanding and application of grammatical rules and basic morphological methods in Arabic, taking into account the correct spelling skills.</p> | | | | | |
| CHEM611 | General Chemistry | 2 | 2 | 3 | |
| <p>This course demonstrates atomic theories, relationships between structure and properties of matter, scientific notation, density calculation, Atomic structure and energy levels, periodic table, ions formation and chemical bonding , chemical reactions and emphasizing the chemical change, balancing equation, Discussion on gas law includes properties and application of gas laws, Acids and bases, solution and clarification of acid – base concept.</p> | | | | | |
| ENGG610 | Introduction to Engineering | 2 | 2 | 3 | |
| <p>This course provides an introduction to the fundamental concepts and practices of engineering. It covers the basics of engineering, including the role of engineers, the engineering design process, and common measurement units and techniques. The course also includes a laboratory component focused on practical hands-on experiences with measurements and basic workshop skills like drilling and grinding.</p> | | | | | |
| ENGL611 1 | English Communication Skills | 3 | 0 | 3 | |
| <p>This is an introductory course in English communication designed to provide comprehensive, up-to-date and relevant instruction in the correct use of grammar. It intends to build up students' confidence in communicating their thoughts, ideas, information and messages through the functions and structures of different words, phrases, clauses, sentences and paragraphs. In addition, the integration of language skills increases their communicative competence and prepares them for the academic and social challenges in college and beyond.</p> | | | | | |
| EUTH500 | Euthenics | 1 | 0 | 0 | |
| <p>This course is designed to bring in the policies and procedures in the university, to guide the students in the performance of their respective roles and to become adept on ideals needed in their academic pursuit. Thus, students are oriented on the history, vision, mission, values and objectives of the university, the services and academic support available, the academic and non-academic policies, the different misconduct and violations with corresponding penalties in which the learning objectives are better facilitated by various classroom discussion through collaborative teamwork learning experience.</p> | | | | | |
| SCIE631 | Biology | 2 | 2 | 3 | |
| <p>This course focuses on the detailed knowledge and understanding of the fundamental life processes and functions of living systems including the nature of knowledge relating to cell structure, function and metabolism, bioenergetics, genetics and biotechnology, cellular reproduction and cell division, evolution, biodiversity, and ecology. The students will demonstrate the importance between explanations based on evidence through inquiry-based laboratory activities to provide insight into scientific method.</p> | | | | | |

| | | | | | |
|--|------------|---|---|----|--|
| MATH633 | Calculus 1 | 3 | 0 | 3 | |
| This course is intended to develop practical skills in differential calculus and analytic geometry. Emphasis is placed on functions, limits and continuity, fundamental concepts of analytic geometry, explicit and implicit differentiation of algebraic and transcendental functions, conics, higher derivatives, polar coordinates and its applications (equations of tangent and normal lines, sketching polynomial curves, maxima and minima problems and time rates. | | | | | |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | L Hrs | L Hrs | CR Units | PREREQUISITE/S |
|--|-----------------------------------|----------|----------|-------------|----------------|
| CSCI601 | Programming for Engineers | 2 | 2 | 3 | |
| Fundamental principles, concepts, and methods of programming with emphasis on applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; and use of programming logic in solving engineering problems. | | | | | |
| ENGL621 | English Communication Skills 2 | 3 | 0 | 3 | ENGL611 |
| This is an intermediate course in English communication geared towards equipping the college students with writing skills in preparation for academic writing. It progresses from familiarizing the sentence conventions to balancing the structures of the sentence for variation and rhythm. Further, it enables students to follow the principles that govern the composition writing in achieving unity, coherence, and emphasis; to improve their expository, descriptive, narrative, and argumentative works and to get hold of the discipline in academic writing for future advantages by providing them the opportunity in adhering the process of writing for effective communication. | | | | | |
| HIST600 | History of Bahrain and GCC Region | 3 | 0 | 3 | |
| <p>دراسة تاريخ مملكة البحرين ومنطقة الخليج العربي ويُظهر تعداد للأحداث الهامة في البحرين ومنطقة الخليج العربي HIST600 يتناول مقرر بدءاً من الحضارات القديمة و مروراً الى العهد وأثارها على الوضع الراهن ، و يغطي الأهمية الاستراتيجية والمكانية للبحرين للبحرين الاسلامي، والاحتلال البرتغالي، وصراع القوى في القرن السابع عشر، وصعود قبيلة العتوب، والبحرين تحت الحماية البريطانية وابرام ، ويتناول وصف الاماكن والشخصيات والتطورات التاريخية المعاهدات مع بريطانيا، وانسحاب القوات البريطانية من البحرين والخليج والانجازات في البحرين في عهد حكام البحرين، والبعد العربي والاسلامي في تكوين هوية البحرين ، الانضمام لمجلس التعاون الخليجي ، وتاريخ دول الخليج العربي (دول مجلس التعاون الخليجي)، ومع نهاية الكورس يكون الطالب قادر على تحليل الجذور التاريخية للبحرين لتكوين الهوية الوطنية ، والتمتع بمقدرة الاتصال الشفهي والكتابي والعمل بشكل منتج وفعال ضمن فريق واحد.</p> <p>The HIST600 course includes the history of the Kingdom of Bahrain and the Arabian Gulf region. It includes the important events in Bahrain and the Arabian Gulf region and their impact on the current situation. It covers the strategic importance of Bahrain, starting with “Ancient civilizations and passing through” the Islamic era, Bahrain’s entry into Islam, Portuguese occupation, competition of powers in the 17th century and the rise of a tribe of Al-Atub. It includes the history of Bahrain under the British protection and the conventions between Bahrain and Great Britain up to British troops leaving the region. It describes the places and persons as well as the historical developments and achievement in Bahrain during the time of Al-Khalifah. It includes independence of Bahrain, issuing of the first constitutional law, reform project by His Majesty King Hamad, constitutional amendments, establishment of GCC, history of Arab</p> | | | | | |

Gulf states. It makes the student able to present his patriotic character through historical discussions.

| | | | | | |
|---------|------------|---|---|---|---------|
| MATH713 | Calculus 2 | 3 | 0 | 3 | MATH633 |
|---------|------------|---|---|---|---------|

This course provides the students with knowledge and understanding of core concepts, theories and principles in evaluating definite and indefinite integrals and its applications in solving engineering and computing problems. The course also covers solutions to ordinary differential equations which can be used in modeling important applications in the scientific and engineering fields.

| | | | | | |
|---------|----------------------|---|---|---|---------|
| PHYS631 | University Physics 1 | 2 | 2 | 3 | MATH633 |
|---------|----------------------|---|---|---|---------|

This course is designed to explore the concepts of motion using vectors and other mathematical models and their advanced application, such as the application of Newton's laws of motion, projectile motion, work, energy, momentum and impulse, rotational dynamics, equilibrium of a rigid body, and periodic motion.

| | | | | | |
|---------|---------------------|---|---|---|--|
| ENGG711 | Engineering Drawing | 2 | 2 | 3 | |
|---------|---------------------|---|---|---|--|

This course deals with core theories, principles and concepts of the topics of This course deals with the application of Computer-Aided Drafting Design (CADD) in sketching and drawing to produce engineering drawings. The student will learn the appropriate CAD drawing and modifying commands to generate 2D drawings and orthogonal projections of 3D drawings. The course will cover editing, modifying and plotting 2D and 3D drawings.

| | | | | | |
|--------------|--|--|--|----|--|
| TOTAL | | | | 18 | |
|--------------|--|--|--|----|--|

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|--------------|---------|---------|--------------|-----------------|
|-------------|--------------|---------|---------|--------------|-----------------|

| | | | | | |
|---------|------------------------|---|---|---|---------|
| CSCI627 | Computer Programming 1 | 2 | 2 | 3 | CSCI601 |
|---------|------------------------|---|---|---|---------|

This is an introductory course designed to equip students with the foundational skills necessary for computer programming. The lecture classes will cover a broad range of topics essential for beginners, such as understanding tokens, variables, data types, and control structures. In addition to that, students will learn how to manage input and output data and string manipulation, providing a strong theoretical foundation for students. In laboratory sessions, students will apply the theoretical concepts learned in lectures using Python. These sessions aim to solidify students' understanding and enable them to confidently apply their programming skills in practical scenarios.

| | | | | | |
|---------|----------------|---|---|---|---------|
| ENGG724 | Thermodynamics | 3 | 0 | 3 | PHYS631 |
|---------|----------------|---|---|---|---------|

Thermodynamics deals with the study of the properties of the pure substances and their relations to the different processes related to energy concepts, ideal gas laws, work and heat, and steam cycles. It also includes a critical evaluation of various laws and its practical applications of thermodynamic principles in power plants.

| | | | | | |
|---------|--------------|---|---|---|--|
| HUMR600 | Human Rights | 3 | 0 | 3 | |
|---------|--------------|---|---|---|--|

يتناول هذا المقرر تمكين الطالب و جعله قادرا على معرفة الخلفية التاريخية لحقوق الإنسان، المفاهيم و الاصول الفلسفية و الرؤيا الاسلامية لحقوق الانسان كما يتناول بالعرض و التحليل مصادر حقوق الإنسان كالإعلان العالمي لحقوق الإنسان، و العهد الدولي الخاص بالحقوق المدنية و السياسية و العهد الدولي الخاص بالحقوق الاقتصادية و الإجتماعية و الثقافية و الوثائق الدولية الأخرى ذات الصلة بحقوق الإنسان ماورد فيها من الحقوق و التمييز بينها. كما يتناول بالمقارنة ذاتها ما ورد في الوثائق الوطنية مثل دستور مملكة البحرين و الميثاق الوطني و كيفية تطبيقها. و يُمكن الطلبة من مهارات تحليل و تفسير و نقد التطبيقات و التجاوزات فضلا عن القدرة على التحليل و التواصل و عرض مسائل حقوق الإنسان بمختلف الوسائل.

This course makes the students able to know the background, main concepts of Human Rights and the philosophical thoughts and Islamic view which contribute in modern Human Rights. It makes them able to

analyze what is mentioned in different kinds of Human Rights sources as Universal Declaration of Human Rights, International Covenant on Civil and Political Rights and International Covenant on Economic, Social and Cultural Rights. It deals in the same approach with the National Sources of Human Rights such as the Constitutional Law of Kingdom of Bahrain and National Action Charter with applications as well. The course makes the students able to analyze, discuss and debate Human Rights issues in different ways.

| | | | | | |
|---------|----------------------------|---|---|---|--|
| MATH621 | Probability and Statistics | 3 | 0 | 3 | |
|---------|----------------------------|---|---|---|--|

This course provides a demonstration of the main concepts of probability and statistics with applications. It also covers identifying the theorem of probability and linked with real life problems. How to differentiate between the combination and permutation; Explain how to find the mean and variance from the moment generating function. Explain and interpret the findings from different hypothesis tests for decision making. Finally, SPSS will be used to run the statistical measures (e.g. hypothesis tests and regression model)

| | | | | | |
|---------|-----------------------|---|---|---|---------|
| ENVS711 | Environmental Science | 3 | 0 | 3 | SCIE631 |
|---------|-----------------------|---|---|---|---------|

This course is an introduction to environmental science focusing on interrelationships of the natural world, sustainable development with environmental, economic and societal dimensions, energy transformations, ecological process and relationships, energy flow through systems, human population growth, water processes and cycles, impacts of climate change, "green" electronic processes, energy utilization and efficiency, conventional and alternative energy sources, present day agricultural practices, biodiversity and threats by human activity, and conversation issues.

| | | | | | |
|---------|----------------------|---|---|---|------------------|
| PHYS711 | University Physics 2 | 2 | 2 | 3 | PHYS631, MATH713 |
|---------|----------------------|---|---|---|------------------|

This course is designed to explore the concepts of electricity and magnetism using the concepts of mechanics, vectors, and other mathematical models and their advanced application, such as application of Coulomb's law, Gauss's law, Ohm's law, Kirchhoff's laws, electric potential and potential difference, basic circuits, series and parallel circuits and combinations, magnetic field and flux, induced EMF and applications such as electric motors and basic AC electric generators.

| | | | | | |
|--------------|--|--|--|----|--|
| TOTAL | | | | 18 | |
|--------------|--|--|--|----|--|

SECOND YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|---------------|---------|---------|--------------|-----------------|
| ENGG726 | Heat Transfer | 3 | 0 | 3 | ENGG724 |

This course focuses on steady state and time-dependent conduction in one- and two-dimensions; forced convection, internal and external flows; heat exchangers; introduction to radiation; elements of thermal system design.

| | | | | | |
|---------|-------------------------|---|---|---|---------|
| ENGL712 | Technical Communication | 3 | 0 | 3 | ENGL621 |
|---------|-------------------------|---|---|---|---------|

This course allows students to gain practical experience and a deeper understanding of the role of technical communication in fostering career readiness and lifelong learning. It helps students develop vital rhetorical skills for creating documents and delivering presentations in the workplace. Moreover, it enables students to present technical information clearly and effectively in professional settings.

| | | | | | |
|---------|-----------------------|---|---|---|---------|
| ENGG720 | Engineering Materials | 3 | 0 | 3 | CHEM611 |
|---------|-----------------------|---|---|---|---------|

This course deals with the study the core principle and concept of engineering material science. It covers the defining features of properties and structure of different engineering materials. It discusses the classifications of materials such as metals, polymers, ceramics, and composites. It also covers the formation of bonds and forces between particles, amorphous and crystalline structure, the impact factor, solid

solutions and phase diagram, and defects in crystalline materials. It also covers the analysis of the physical, mechanical, electrical and magnetic properties of materials. This also emphasizes the various considerations in selecting materials appropriate for a particular application.

| | | | | | |
|---|---------------------------|---|---|----|---------|
| MATH731 | Multivariate Calculus | 2 | 2 | 3 | MATH713 |
| This is the third part of the course in calculus focused on vector and multi-variable calculus. Topics associated with the course demonstrate advanced knowledge and understanding of the following: vectors and vector operators, calculus of functions of several variables including partial differentiation and multiple integrals, Lagrange multipliers, applications of partial differentiation, line integrals, Green's theorem, Stoke's theorem, and Divergence theorem. The course also includes laboratory components that make use of MATLAB as tool in solving problems in Multivariate Calculus. | | | | | |
| MATH722 | Advanced Mathematics | 2 | 2 | 3 | MATH713 |
| This course deals with the study of complex numbers, series solutions of ordinary differential equations by power series, Bessel Function, Frobenius method. Basics of Fourier series, Fourier transform, Laplace and inverse Laplace Transforms. Using MATLAB or other mathematical software in order to solve mathematical problems. | | | | | |
| ENGG721 | Electric Circuit Theory 1 | 2 | 2 | 3 | PHYS711 |
| The Course deals with the study of core theories, principles and concepts for analysis of DC networks through the application of basic laws and network theorems. It covers the inter relationship between the parameters of DC circuits ,critical analysis of complex circuits excited by DC voltages and current sources through basic circuit laws - KVL and KCL and structured methods and theorems like nodal analysis, Mesh analysis, superposition, Maximum power transfer& Millman's theorem. | | | | | |
| TOTAL | | | | 18 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|-----------------------|---------|---------|--------------|-----------------|
| PHYS722 | University Physics 3 | 2 | 2 | 3 | PHYS711 |
| This course is designed to explore the concepts of heat and thermodynamics, waves and optics, relativity, molecular, atomic, and nuclear physics using the concepts of mechanics, electricity and magnetism, vectors, and other mathematical models and their advanced application, such as the application of the laws of thermodynamics, light and electromagnetic waves, Einstein's special theory of relativity, Planck's Quantum theory, de Broglie's waves, Heisenberg's Uncertainty Principle, Dirac's electron theory, Hund's Rule, and atomic models from Thompson's to Quantum Mechanical, as well as nuclear models. | | | | | |
| ENGG725 | Engineering Mechanics | 3 | 0 | 3 | PHYS631 |
| This course will cover both nondeformable and deformable systems. The section on nondeformable bodies will include topics such as force components, free body diagrams, vectors, resultant force systems, moments of forces, equilibrium of rigid bodies, and the critical analysis of trusses. The section on deformable bodies will explore the relationship between externally applied loads and their internal effects on bodies. It will include the analysis of various stresses, including normal, flexural, shear, and bearing stress | | | | | |
| ENGG731 | Electronics 1 | 2 | 2 | 3 | ENGG721 |
| This course discusses core theories, principles and concepts of semiconductors, PN junction diode, other types of diodes & bipolar junction transistor (BJT). It also relates to fundamental diode circuit's application and design, rectifiers, limiters, doublers, Zener diode characteristics and applications, and special purpose diodes, Optoelectronic devices and circuits. The course evaluates the operation of bipolar junction transistor | | | | | |

(BJT), and its characteristic and parameters; BJT as amplifier and switch, DC analysis and different biasing methods.

| | | | | | |
|---------|---------------------------|---|---|---|---------|
| ENGG732 | Electric Circuit Theory 2 | 2 | 2 | 3 | ENGG721 |
|---------|---------------------------|---|---|---|---------|

This course deals with core theories, principles and concepts of the topics of sinusoidal voltage and current on RLC circuits, vector algebra and its application to AC circuit analysis, sinusoidal and non-sinusoidal single phase system, and three phase systems. It also covers reactance, impedance, resonance, power in AC circuits, power factor correction and impedance network. The course evaluates the theorems which includes Kirchhoff's laws, Mesh, Superposition, Nodal Analysis, Thevenin's, Norton, and Maximum power transfer.

| | | | | | |
|---------|--------------------------------|---|---|---|---------|
| MATH732 | Numerical Methods and Analysis | 2 | 2 | 3 | MATH731 |
|---------|--------------------------------|---|---|---|---------|

This course demonstrates critical knowledge and understanding of specialist theories, principles and concepts of the study of numerical approximations and errors, numerical solutions of non-linear equations, interpolation and curve fittings, numerical differentiation and integration. The course also covers analysis of accuracy of numerical differentiation and integration methods and solution of initial value problems using Euler Method. Analysis of accuracy of Euler's method. The course also includes laboratory components that make use of MATLAB as tool in solving problems in Numerical Analysis.

| | | | | | |
|---------|----------------|---|---|---|---------|
| MATH733 | Linear Algebra | 2 | 2 | 3 | MATH731 |
|---------|----------------|---|---|---|---------|

This course use specialist level skills to relate to and adapt main and core theories and concepts in the study of matrices and determinants, and their applications in numerical solutions of systems of linear equations. It also includes important topics such as linear transformations, eigenvalues and eigenvectors, complex vectors and matrices and numerical linear algebra. In the laboratory, MATLAB is use as a mathematical software and solutions to a variety of mathematical problems are determined.

| | | | | | |
|--------------|--|--|--|----|--|
| TOTAL | | | | 18 | |
|--------------|--|--|--|----|--|

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|-------------|---------------------|---------|---------|--------------|-----------------|
| ENGG733 | Engineering Economy | 3 | 0 | 3 | MATH621 |

This course deals with the advanced study of the core theories, principles and concepts of economic environment, interest and money-time relationship, depreciation, capital financing, comparing alternatives, replacement studies, break-even analysis, benefit cost ratio, and benefit cost difference. It presents mathematical techniques and practical advice for evaluating decisions in the design and operation of engineering systems.

| | | | | | |
|---------|-----------------|---|---|---|---------|
| ENGG815 | Fluid Mechanics | 2 | 2 | 3 | ENGG725 |
|---------|-----------------|---|---|---|---------|

Fluid Mechanics deals with the study associated with details of the properties of the fluid to adept the necessary Knowledge related to fluid power concepts such as the fluid properties of compressible and incompressible fluids which include Density, viscosity, surface tension, specific gravity, specific weight and bulk modulus and compressibility. The topics covered fluid statics and hydrostatic forces; fluid mechanics fundamentals, including concepts of mass and momentum Integral relations for control volume: Bernoulli, energy and momentum equations. Flow in pipes; laminar and turbulent flow, Reynolds number and Moody chart, laminar and turbulent boundary layer fundamentals.

| | | | | | |
|---------|---------------|---|---|---|---------|
| ENGG812 | Electronics 2 | 2 | 2 | 3 | ENGG731 |
|---------|---------------|---|---|---|---------|

This is an advanced course in electronics which deals with concept, analysis and design of electronic circuits using linear and integrated devices. In this course include AC and DC analysis, principles, and concepts of frequency response of BJT amplifier and further extends the study to multistage amplifier and various FET.

The other topics include study and critical analysis of Operational Amplifier, its application, Feedback topologies & explore NE555 Timer and its applications.

| | | | | | |
|---------|-------------------|---|---|---|---------|
| ENGG816 | critical Machines | 3 | 0 | 3 | ENGG732 |
|---------|-------------------|---|---|---|---------|

This course examines the core theory, characteristics, construction operation and application of static and rotating electrical machines. It includes the detailed study and analysis of direct current motors, direct current generators, AC Machines, special machines etc. The course offers a detailed understanding of the application of electromagnetic machines in the field of industry.

| | | | | | |
|---------|---------------------|---|---|---|---------|
| ENGG813 | igital Logic Design | 2 | 2 | 3 | ENGG731 |
|---------|---------------------|---|---|---|---------|

This course provides critical knowledge and understanding of designing digital logic circuits. It covers number systems and conversion, Boolean algebra, algebraic manipulation, applications of Boolean algebra, Karnaugh maps, multi-level gate circuits, multiplexers, decoders, comparators, latches and flip-flops, registers and counters, programmable logic devices. Through laboratory and in-course project, the students will creatively implement complex applications of digital logic circuits.

| | | | | | |
|---------|-----------------------|---|---|---|---------|
| MATH734 | ifferential Equations | 3 | 0 | 3 | MATH731 |
|---------|-----------------------|---|---|---|---------|

This course provides the students with knowledge and understanding of ordinary differential equations of first order and first degree with applications, second and higher order ordinary linear differential equations with constant coefficients and its applications, simultaneous differential equations, formation of partial differential equations their classification, solution of heat equation, wave equation and its use in modelling important applications in the scientific and engineering fields.

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|--------------|--|--|----|--|--|
| TOTAL | | | 18 | | |
|--------------|--|--|----|--|--|

THIRD YEAR

FIRST TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|-----------------------------------|---------|---------|--------------|------------------|
| MECH812 | Hydraulics and Electro-hydraulics | 2 | 2 | 3 | ENGG815, ENGG813 |
| This course deals with the core concepts and physical principles of hydraulics, circuit symbols and components of a hydraulic and Electro-Hydraulics system. It also covers the study of the components of the power supply, Hydraulic Power Generation, control valves, actuators and accessories, and the extended cylinders. Students will also learn to design and implement hydraulic and electro-hydraulic system for complex industrial applications. students will critically analyze, evaluate and synthesize the Electrical circuit Design including electrical components and memory Circuit, Time lag relays, Pressure Control, Speed control valve. Hands-on simulation on advanced industrial applications related to hydraulics and electro hydraulics is conducted for the students using the Festo hydraulics modules. | | | | | |
| IENF811 | Computer Networks 1 | 2 | 2 | 3 | PHYS631 |
| This course integrates the core theories, principles, concepts, structure, functions and components of the Internet and computer networks. The OSI and TCP/IP models are used to examine the services and the associated protocols in each layer. The concepts and structure of IPv4 addressing and subnetting, its application, operation and implementation to networks are discussed. The laboratory part makes use of a range of approaches including the Packet Tracer and GNS3 to allow students to implement static routing and critically analyze network requirements, issues and/or problems. These simulators will allow the students to build networks, use appropriate devices and IP addresses, and perform configurations. | | | | | |
| MECH811 | Pneumatics and Electro-Pneumatics | 2 | 2 | 3 | ENGG815, ENGG813 |

This course exposes the student to critical knowledge and technical skills related to industrial pneumatic and electro-pneumatic systems. Areas of study integrates the core theories and concepts of pneumatic and electro-pneumatic systems; interfacing of various actuating and sensing elements; and use of hardware and software to develop complex mechatronics system.

| | | | | | |
|---------|-----------------|---|---|---|---------|
| ENGG821 | Control Systems | 2 | 2 | 3 | ENGG732 |
|---------|-----------------|---|---|---|---------|

The course deals with the study of the concepts of control systems. It also discusses mechanical and electrical modeling using conventional differential equations, reduction rules applied to block diagrams of linear control systems, and signal flow graphs. Laplace and Inverse Laplace Transformations. Discussion of the time-domain response of first and second-order control systems, steady-state errors, Routh-Hurwitz Criterion for stability, root locus method, frequency response (bode diagram and polar plot), Nyquist stability criterion, and compensator design techniques. MATLAB is used for analyzing and simulating control systems.

| | | | | | |
|---------|----------------------|---|---|---|---------|
| MATH821 | Optimization Methods | 3 | 0 | 3 | MATH732 |
|---------|----------------------|---|---|---|---------|

The course takes an advanced and unified view of optimization and covers the main areas of application of core optimization algorithms. The topics include linear optimization, robust optimization, network flows, dynamic optimization and non-linear optimization.

| | | | | | |
|---------|--------------------|---|---|---|---------|
| ENGG822 | Safety Engineering | 3 | 0 | 3 | ENGG733 |
|---------|--------------------|---|---|---|---------|

This course deals with the detailed study the principles of safety engineering and applications of safety principles to industrial and commercial systems. It covers topics concerning safety management, chemical hazards, equipment hazards, occupational health, fire prevention and control, electrical safety and environmental safety. Further, students will learn how to conduct risk analysis and some of the mitigation measures.

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|--------------|--|--|----|--|--|
| TOTAL | | | 18 | | |
|--------------|--|--|----|--|--|

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|------------------------------------|---------|---------|--------------|-----------------|
| MECH821 | Intelligent Control | 2 | 2 | 3 | ENGG813,MATH821 |
| This course integrates core concepts and theories of Artificial Neural Networks (ANN), Perceptron networks, training methodology, and typical application to linearly separable problems, Fuzzy systems, training methods and implementation of ANN and Fuzzy systems for complex industrial applications. Students will also learn to utilize more advanced tools, features, and training methods in implementing intelligent control system. Higher level software programming will be used for critically analyzing, evaluating, and synthesizing the implemented fuzzy logic and neural networks systems. | | | | | |
| MECH822 | Modern Control System | 2 | 2 | 3 | ENGG821 |
| This course deals with details knowledge and understanding of theories for linear systems. This module develops a detailed understanding of the fundamentals of linear systems analysis and design using the state space approach. Topics covered include state space representation of systems; solution of state equations; stability analysis using Lyapunov methods; controllability and observability; linear state feedback design; and state observer. MATLAB is used for analyzing and simulating Linear systems. | | | | | |
| ENGG831 | Engineering and Project Management | 3 | 0 | 3 | ENGG733 |
| This course provides critical knowledge and understanding of project management and the essential tools needed to deliver successful projects based on agreed scope, time and budget from the standpoint of the project manager, who must skillfully initiate, plan, organize, implement and control non-routine activities to successfully complete the projects based on the metrics. Topics include project life cycles, principles, and | | | | | |

concepts of strategic management process in project selection and organization, project cost and time estimation. Students will be exposed to the different cost estimation tools as well the use of PERT- CPM and Gantt Charts to monitor progress, in addition to methods in performing project audits, and risk management to critically evaluate various project management situations.

MECH823

Programmable Logic Controllers

2

2

3

MECH811

The course deals with core concepts and theories of the hardware and software of Programmable logic controllers. This course also deals with programming, connecting, and testing Programmable Logic Controllers (PLCs) for control of complex industrial/commercial processes. It covers, sensor interfacing, application of PLCs in some specific Industrial process, and utilization of a hand-held programmer in troubleshooting PLCs. Hands-on simulation is conducted for the students to understand the critical PLC implementation process in industry using advanced tools such as Festo PLC modules and CodeSys software.

MECH824

Power Electronics

2

2

3

ENGG812

This course explores various power semiconductor switches, including power diodes, SCR, Triac, GTO, and advanced power transistors like MOSFET and IGBT. It also delves into triggering devices such as UJT, DIAC, and PUT. Key topics include single-phase and three-phase AC-DC converters, voltage regulators, and single-phase and three-phase DC-AC inverters with PWM techniques. Additionally, the course covers DC-DC converters, specifically boost and buck converters, along with the basics of chopper configurations. Practical applications of power electronics in systems like solar energy and UPS circuits are also included.

MECH825

Embedded Systems

2

2

3

ENGG813

This course offers three essential components: critical knowledge and understanding of microcontroller-based systems design, development, and implementation; practical exploration of various embedded system types; and creative implementation of complex applications using microcontroller-based systems. The course covers a wide range of topics, including microcontroller architecture, programming, digital and analog I/O interfacing for different components, task scheduling, interrupt and internal timers management, and communication interfaces. Students will have hands-on experience in the laboratory and will undertake an in-course project to apply their knowledge and creativity in implementing sophisticated microcontroller-based system applications.

TOTAL

18

THIRD TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|-------------------------------------|--------------------|--------------------|-------------------------|------------------------|
| MECH831 | Machine Vision | 2 | 2 | 3 | MECH822 |
| This course discusses about core theories, principles and concepts of machine vision devices and techniques and also learns about computer vision systems and digital image processing. It also relate to fundamental issues and techniques of computer vision and image processing. Emphasis will be on physical, mathematical, image-processing, pattern recognition, and feature extraction aspects of vision. The course will have a proper Lab activities to enable students understand the breadth and depth of the lecturing materials. The main topics that will be as: Machine vision concepts, Image acquisition, Lighting, Image formation, Image conversion, Image processing and analysis. Image enhancement, Edge detection and Image segmentation. | | | | | |
| MECH832 | Process Instrumentation and Control | 2 | 2 | 3 | ENGG726, ENGG821 |
| This course deals with the core concepts and theories of industrial process control and the instrumentation used for it. It elaborates various sensors used in process industry and special emphasis is given on measurement sensors such as Pressure transmitter, Ultrasonic sensors, thermistors and proportional | | | | | |

valves. Students will learn the working principle, specifications, design and selection aspects used for sensing complex process parameters, along with merits and limitations of each type of sensor. The course will also build the detailed knowledge to the participants on working principles of control loop components, control strategies, and PID controller fundamentals including terminology, algorithms and advanced methods. Furthermore, In this course, students will learn how to design, implement, and maintain SCADA programs to effectively monitor and control industrial processes. A special emphasis on real life implementations, case studies and international standards would ensure students to critically analyze, evaluate and synthesize with their day-to-day practice.

| | | | | | |
|---------|----------|---|---|---|------------------|
| MECH833 | Robotics | 2 | 2 | 3 | MECH824, MECH822 |
|---------|----------|---|---|---|------------------|

This course facilitates the core learning and understanding of robot manipulators for students to understand complex design and applications of robots in industrial application. Successful completion allows student to formulate the kinematics and dynamic modelling of robotic manipulators consisting of a serial chain of rigid bodies and to implement control algorithms with sensory feedback during the lab sessions. Students will gain specialist skills in dealing with complex control architecture and manipulator structure typical to new-generation robots.

| | | | | | |
|---------|-------------------|---|---|---|---------|
| ENTR801 | Technopreneurship | 3 | 0 | 3 | ENGG831 |
|---------|-------------------|---|---|---|---------|

This course provides advanced concepts, facts and ideas of starting a business, working for an entrepreneurial company or working with entrepreneurial firms as an investor or advisor. The course is designed to demonstrate necessary techniques and tools to planning and organizing business and is aimed to integrate the overall dimensions of entrepreneurship, including identifying a winning business opportunity, gathering funding for and launching a business, growing the organization and harvesting the rewards. In particular topics covered different types of entrepreneurship, its importance for economies, business model creation, financial evaluation and financing the start-up.

| | | | | | |
|---------|--|---|---|---|---------|
| ENGG851 | Professional Ethics and Engineering Laws | 3 | 0 | 3 | ENGG831 |
|---------|--|---|---|---|---------|

This course covers topics in the core theories and concepts of ethics, law, contracts, intellectual property, the responsible engineer, moral thinking, risk/safety/liability, employer responsibilities, product liability, and environmental responsibilities. The course deals with several case studies of ethical problems in engineering. It discusses the core concepts of environmental protection and sustainability to understand how they relate to engineering ethics. The course is intended to promote greater reflection by engineers on their activities to better understand the social dimensions of Engineering practice.

Major Elective 1 (Student Must Choose 1 Course)

| | | | | | |
|---------|---|---|---|---|---------|
| MECH851 | Artificial Intelligence (Elective) | 2 | 2 | 3 | MECH851 |
|---------|---|---|---|---|---------|

This course provides a detailed understanding on concepts and techniques of artificial intelligence (AI) for mechatronics engineering students. The course covers topics such as machine learning, neural networks, fuzzy logic, expert systems, and their applications in mechatronics systems. Students will learn how to design, implement, and evaluate AI-based solutions for various mechatronics problems.

| | | | | | |
|---------|--|---|---|---|---------|
| MECH862 | System Modeling and Simulation (Elective) | 2 | 2 | 3 | MECH862 |
|---------|--|---|---|---|---------|

This course examines core theories and principles of engineering system modelling and simulation methods, as well as numerical and computer based solution techniques utilized in industrial and engineering environments. Techniques for finding solutions to these systems include: graphical, algebraic, numerical, state space, simulation and computational processes. Case studies in industry and engineering applications are used to illustrate the techniques and modelling concepts. Examples of simulation and analysis methods will be related to the linear and non-linear, deterministic and non-deterministic systems

| | | | | | |
|---------|---|---|---|---|---------|
| MECH853 | Digital Control Systems (Elective) | 2 | 2 | 3 | MECH853 |
|---------|---|---|---|---|---------|

Introduction to Digital Control, Discrete-Time Systems (Difference equations, The z-transform, z-Transform solution of difference equations, The time response of a discrete-time system, The modified z-transform, The sampling theorem), Modeling of Digital Control Systems, Stability of Digital Control Systems, Digital Control System Design (z-Domain root locus, Digital implementation of analog controller design, Direct z-domain digital controller design, Frequency response design, Direct control design), Discrete-time State-Space Representation, The solution of linear state-space equations, The transfer function matrix, Stability of state-space realizations, Controllability and sterilizability, Observability and detectability, Detectability, State-space realizations, State Feedback Control, Pole placement, State estimation, Observer state feedback, Optimal control, The linear quadratic regulator.

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| TOTAL | 18 |
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FOURTH YEAR**FIRST TRIMESTER**

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|--|--|---------|---------|--------------|-----------------|
| Major Elective 2 (Student Must Choose 1 Course) | | | | | |
| MECH861 | Wireless Communications (Elective) | 2 | 2 | 3 | MECH861 |
| This course aims to develop the core knowledge of communications theories and their applications in digital communications. The course covers the structure of the digital communication systems, analog modulation technique, digital modulation techniques, probability of error in digital communication system, multiple access techniques, channels and source encoding, mobile communication systems | | | | | |
| MECH866 | Digital Signal Processing (Elective) | 2 | 2 | 3 | MECH866 |
| The course deals with the detailed study of the core theories, principles and concepts of digital signal processing; discrete convolution; Z-transform; sampled data system; digital filters; discrete Fourier transforms; fast Fourier transforms. DSP Applications. Introduction of 2-D signal (image) processing. This course is designed to provide students with a comprehensive treatment of the important issues in design, implementation and applications of digital signal processing theory and algorithm. Further, computer simulation exercises are intended to familiarize the student with implementation aspects and the application of theoretical knowledge to practical problems. | | | | | |
| IENF821 | Computer Network 2 (Elective) | 2 | 2 | 3 | IENF821 |
| This course provides an in-depth and advanced discussion of routing technology. It integrates the core theories, concepts, functions and operations of a router including the principles and applications of routing protocols. Topics include router components and configuration; Unicast and Multicast routing protocols: RIPv1, RIPv2, EIGRP, OSPF and BGP; VLSM and IPv6. The students make use of a range of approaches including the Packet Tracer, GNS3 and the actual network devices in the laboratory in performing advanced and complex network configurations using the different routing protocols and in the critical analysis of network requirements, issues and/or problems. | | | | | |
| Major Elective 3 (Student Must Choose 1 Course) | | | | | |
| MECH863 | Special Topics in Mechatronics Engineering (Elective) | 3 | 0 | 3 | MECH863 |
| Selected topic in Mechatronics Engineering includes recent advancement in automation and mechatronics which are not included in regular courses. | | | | | |

| | | | | | |
|--|---|---|---|----|-----------------------------------|
| MECH864 | Smart Manufacturing (Elective) | 3 | 0 | 3 | MECH864 |
| The purpose of this course is to equip students with the knowledge and skills needed to meet the demands of the manufacturing workforce of the future. It provides an overview of manufacturing systems from product design to facility planning, processes, production systems, and quality control techniques. The role of smart technologies, like IOT, data analytics, cloud computing and automation in reshaping manufacturing engineering is emphasized. | | | | | |
| MECH865 | Power Plant (Elective) | 3 | 0 | 3 | MECH865 |
| The course deals with the major systems and components practice related to power plant to generate electrical power such as Boiler, Turbine, Condenser and pumps. The topics covered are: thermodynamic cycles; ranking cycle modified Rankin cycle with re-heater and feed water heater, also steam, gas and combined cycle power plant are covered. This course required the student to integrate all these topics to analyze and design the deferent type of power plant systems and components. | | | | | |
| MECH841 | Industrial Automation | 2 | 2 | 3 | MECH823 |
| This course integrates core theories of mechanical design, computer control and electronic components in designing an Industrial automation system. Students will be provided with the detailed knowledge and understanding on various automation strategies, automation layouts, material handling devices used in assembly lines, automated assembly lines and computer integrated manufacturing. It discusses the step by step manner of designing, assembling, and programming a modular station based on the given system requirement. The laboratory uses Codesys software for PLC programming and advanced FESTO educational modules in simulating processes in the modular production system. | | | | | |
| MECH842 | Mechatronics Engineering Design Project A | 0 | 6 | 3 | On Completion of 144 credit units |
| This is the first of two courses in Mechatronics Engineering design sequence which prepares students for engineering practice through a culminating major design experience or capstone based on the knowledge and skills acquired in foundation and core courses and incorporating appropriate engineering standards (IEEE, ISO) as an integral part and with due consideration of multiple realistic constraints tradeoffs. This is a group supervised design project in which students analyze, specify, design, construct, evaluate and adapt physical computing in various applications such as in smart environments and embedded systems. They also incorporate design standards and make decision as a result of multiple design tradeoff/constraints (economics, environmental, social, political, ethical, health and safety, manufacturability, and sustainability) analysis and evaluation as part of the design process. | | | | | |
| TOTAL | | | | 12 | |

SECOND TRIMESTER

| COURSE CODE | COURSE TITLE | LEC Hrs | LAB Hrs | CREDIT Units | PREREQUISITE(S) |
|---|-----------------------|---------|---------|--------------|-----------------|
| MECH843 | Industrial Attachment | 0 | 3 | 3 | MECH833 |
| This course is the practicum course where the students are exposed to actual work environment. The students are required to complete 240 hours of on-site training. They are sent to work environments under the supervision of a practicum professor. Moreover, at the end of the course, individual student submits a final report and a performance evaluation made by the on-site supervisor. | | | | | |

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|---|--|---|---|---|---------|
| MECH844 | Mechatronics Engineering Design Project B | 0 | 6 | 3 | MECH842 |
| <p>This course is a continuation of Mechatronics Engineering Design A (MECH862) which enables students to design a system, component, or process to meet desired needs within realistic constraints through a culminating major design experience or capstone based on the knowledge and skills acquired in foundation and core courses and incorporating appropriate engineering standards (IEEE, ISO) as an integral part and with due consideration of multiple realistic constraints tradeoffs.</p> <p>This is a group supervised design project in which students analyze, specify, design, construct, evaluate and adapt physical computing application in smart environments and embedded systems. They also incorporate design standards and make decisions as a result of multiple design tradeoff/constraints (economics, environmental, social, political, ethical, health and safety, manufacturability, and sustainability) analysis and evaluation as part of the design process.</p> | | | | | |
| TOTAL | | | | 6 | |

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