Directorate of
Higher Education Reviews
Programme Review Report

**University of Technology Bahrain
College of Engineering
Bachelor of Science in Informatics Engineering
Kingdom of Bahrain**

Site Visit Date: 27 February-01 March 2023
HA083-C3-R083

Table of Contents

Acronyms

ABET	Accreditation Board for Engineering and Technology
APR	Academic Programme Review
BSIE	Bachelor of Science in Informatics Engineering
BSME	Bachelor of Science in Mechatronics Engineering
BQA	Education & Training Quality Authority
CCQI	College Committee for Quality Improvement
CILO	Course Intended Learning Outcome
CIS	Campus Information System
CQI	Continuous Quality Improvement
CRC	Curriculum Review Committee
DHR	Directorate of Higher Education Reviews
EAC	Engineering Accreditation Commission
HEC	Higher Education Council
HEI	Higher Education Institution
HRMS	Human Resource Management System
IET	Institution of Engineering and Technology
ILO	Intended Learning Outcome
IRO	Institutional Research Office
MIS	Management Information System
NI	National Instrument
NQF	National Qualifications Framework
OPAC	Online Public Access Catalogue
PDC	Programme Development Committee
PDD	Planning and Development Department
PEO	Programme Educational Objectives
PIAP	Programme Industrial Advisory Panel
PILO	Programme Intended Learning Outcome
QAAD	Quality Assurance and Accreditation Department
SDT	Student Disciplinary Committee
SER	Self-Evaluation Report
SES	Self-Evaluation Survey
SO	Student Outcome

TLA	Teaching, Learning and Assessment
UCQIC	University Continuous Quality Improvement Committee
UTB	University of Technology Bahrain
VLE	Virtual Learning Environment
WBL	Work-Based Learning

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *4*

I. Introduction

In keeping with its mandate, the Education & Training Quality Authority (BQA), through the Directorate of Higher Education Reviews (DHR), carries out two types of reviews that are complementary. These are: Institutional Reviews, where the whole institution is assessed; and the Academic Programme Reviews (APRs), where the quality of teaching, learning and academic standards are assessed in academic programmes within various colleges according to specific standards and indicators as reflected in its Framework.

Following the revision of the APR Framework at the end of Cycle 1 in accordance with the BQA procedure, the revised APR Framework (Cycle 2) was endorsed as per the Council of Ministers' Resolution No.17 of 2019. Thereof, in the academic year (2019-2020), the DHR commenced its second cycle of programme reviews.

The Cycle 2 APR Review Framework is based on four main Standards and 21 Indicators, which forms the basis of the APR Reports of the Higher Education Institutions (HEIs).

The **four** standards that are used to determine whether or not a programme meets international standards are as follows:

Standard 1: **The Learning Programme**

Standard 2: **Efficiency of the Programme**

Standard 3: **Academic Standards of Students and Graduates**

Standard 4: **Effectiveness of Quality Management and Assurance**

The Review Panel (hereinafter referred to as 'the Panel') decides whether each indicator, within a standard, is 'addressed', 'partially addressed' or 'not addressed'. From these judgements on the indicators, the Panel additionally determines whether each of the four standards is 'Satisfied' or 'Not Satisfied', thus leading to the Programme's overall judgement, as shown in Table 1 below.

Table 1: Criteria for Judgements

Criteria	Judgement
All four Standards are satisfied	Confidence
Two or three Standards are satisfied, including Standard 1	Limited Confidence
One or no Standard is satisfied	No Confidence
All cases where **Standard 1** is not satisfied	

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023

5

The APR Review Report begins with providing the profile of the programme under review, followed by a brief outline of the judgement received for each indicator, standard, and the overall judgement.

The main section of the report is an analysis of the status of the programme, at the time of its actual review, in relation to the review standards, indicators and their underlying expectations.

The report ends with a Conclusion and a list of Appreciations and Recommendations.

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *6*

II. The Programme's Profile

Institution Name*	University of Technology Bahrain
College/ Department*	College of Engineering
Programme/ Qualification Title*	Bachelor of Science in Informatics Engineering
Qualification Approval Number	-
NQF Level	-
Validity Period on NQF	-
Number of Units*	70
NQF Credit	612
Programme Aims*	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.
Programme Intended Learning Outcomes*	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.

* Mandatory fields

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 February-01 March 2023   *7*

III. Judgement Summary

<div align="center">

The Programme's Judgement: Confidence

</div>

Standard/ Indicator	Title	Judgement
Standard 1	**The Learning Programme**	**Satisfied**
Indicator 1.1	The Academic Planning Framework	Addressed
Indicator 1.2	Graduate Attributes & Intended Learning Outcomes	Addressed
Indicator 1.3	The Curriculum Content	Partially Addressed
Indicator 1.4	Teaching and Learning	Addressed
Indicator 1.5	Assessment Arrangements	Addressed
Standard 2	**Efficiency of the Programme**	**Satisfied**
Indicator 2.1	Admitted Students	Addressed
Indicator 2.2	Academic Staff	Addressed
Indicator 2.3	Physical and Material Resources	Addressed
Indicator 2.4	Management Information Systems	Addressed
Indicator 2.5	Student Support	Addressed
Standard 3	**Academic Standards of Students and Graduates**	**Satisfied**
Indicator 3.1	Efficiency of the Assessment	Addressed
Indicator 3.2	Academic Integrity	Addressed
Indicator 3.3	Internal and External Moderation of Assessment	Addressed
Indicator 3.4	Work-based Learning	Partially Addressed

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *8*

Indicator 3.5	Capstone Project or Thesis/Dissertation Component	Addressed
Indicator 3.6	Achievements of the Graduates	Addressed
Standard 4	**Effectiveness of Quality Management and Assurance**	**Satisfied**
Indicator 4.1	Quality Assurance Management	Addressed
Indicator 4.2	Programme Management and Leadership	Addressed
Indicator 4.3	Annual and Periodic Review of the Programme	Addressed
Indicator 4.4	Benchmarking and Surveys	Addressed
Indicator 4.5	Relevance to Labour market and Societal Needs	Addressed

IV. Standards and Indicators

Standard 1

The Learning Programme

The programme demonstrates fitness for purpose in terms of mission, relevance, curriculum, pedagogy, intended learning outcomes and assessment.

Indicator 1.1: The Academic Planning Framework

There is a clear academic planning framework for the programme, reflected in clear aims which relate to the mission and strategic goals of the institution and the college.

Judgement: *Addressed*

- The College of Engineering of the University of Technology Bahrain (UTB) has a detailed Academic Plan (2021-2026) that applies to all the college's academic programmes including the Bachelor of Science in Informatics Engineering (BSIE). The plan is aligned with the University's Academic Plan and Strategic Plan, and was developed according to the Policy on Institutional Planning.

- Courses in the curriculum are evaluated on an annual basis while an in-depth review of the programme as a whole, including the Programme Educational Objectives (PEOs)/aims, takes place every three to five years. The last in-depth review resulted in a revised curriculum effective from the academic year 2022-2023. As mentioned in the Self-Evaluation Report (SER) and was confirmed in the interviews with the senior management, the revision results considered and implemented feedback from various stakeholders, including the Programme Industrial Advisory Panel (PIAP).

- As the programme is also accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET), the curriculum complies with the minimum requirements of the EAC and has adopted its seven Student Outcomes (SOs). The SOs are aligned with the Programme Educational Objectives (PEOs)/aims of the BSIE programme, which are clearly stated and have been mapped to the mission of the College and the Institution.

- The title of the qualification 'Bachelor of Science in Informatics Engineering', as documented in the programme profile in the SER, is clearly listed, and the Panel finds it to be concise and consistent with the programme contents. The title is also accurately used

---

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *10*

across all documentation, including students' transcripts, and is further verified by ABET-EAC.

- During the virtual visit, the Panel learned that the BSIE programme has been mapped to the National Qualifications Framework (NQF) requirements by a Mapping Panel, the role of which is usually taken on by the Programme Development Committee (PDC). After a college-internal review of the mapping by a second panel, known as the Confirmation Panel.

- Risks in the programme are managed following the Risk Management Policy, which stipulates regular meetings of the Risk Management Team. The University's Risk Management plan identifies four risk areas: strategic, operations, compliance, and financial. Based on interviews, the main challenge faced by the College is the limited enrolment in the BSIE programme. This is currently being addressed by involving academics in the marketing of the programme, and by providing discounts in enrolment fees to students based on their performance. The Panel also learned that deliberate efforts are being made to encourage students to participate in competitions, which also increases public awareness about the programme.

Indicator 1.2: Graduate Attributes & Intended Learning Outcomes

Graduate attributes are clearly stated in terms of intended learning outcomes for the programme and for each course and these are appropriate for the level of the degree and meet the NQF requirements.

Judgement: *Addressed*

- UTB has five generic graduate attributes that are to be achieved by graduates from all programmes it offers. These attributes are supplemented with Programme Intended Learning Outcomes (PILOs) that match the PILOs required by ABET-EAC. The PILOs themselves are mapped to the PEOs.

- All outcomes at UTB are developed according to the policy on Intended Learning Outcomes (ILOs), among them the PILOs and the Course Intended Learning Outcomes (CILOs), which are all well-defined and are, in general, expressed in measurable terms, and are appropriate for the type and level of the programme/courses, respectively. The courses as well as their ILOs are appropriately mapped to the PILOs, in addition to being mapped to the NQF level descriptors.

- To ensure appropriateness of the level of the degree, the programme follows ABET's EAC SOs. In addition, international benchmarking of the programme and its outcomes takes place informally and formally and is carried out with several institutions within Bahrain, the region and internationally. The selected institutions are required to have similar,

ABET-accredited programmes that have been offered for at least 10 years. During interviews, the Panel learned that the programme is currently in the process of expanding the number of benchmarking institutions.

Indicator 1.3: The Curriculum Content

The curriculum is organised to provide academic progression of learning complexity guided by the NQF levels and credits, and it illustrates a balance between knowledge and skills, as well as theory and practice, and meets the norms and standards of the particular academic discipline.

Judgement: *Partially Addressed*

- The BSIE study plan for full-time students follows a consistent pattern of 17 to 18 credit hours in most trimesters. The Panel learned in interviews that working students usually take a reduced course load, however, not below 12 credit hours. Each course has clearly defined prerequisites resulting in a curriculum flow that allows for timely progression. However, the Panel noted that some prerequisites are not always based on academic reasons. In interviews, the Panel learned that prerequisites are sometimes used to ensure students take a course at the appropriate time in their studies rather than taking them based on appropriate academic justifications (e.g., the prerequisites of IENF721 'Principles of Communication'). Additionally, the College of Engineering offers in addition to the BSIE programme a Bachelor of Science in Mechatronics Engineering (BSME) programme, and the Panel evaluated both. The Panel noticed that some courses in both programmes have identical titles but different codes and that the prerequisites for them differ in each of the two programmes. For instance, ENGG721 and ENGG531 have the same content but different prerequisites. ENGG721, titled 'Electric Circuit Theory 1', is offered in the BSIE programme with PHYS711 'University Physics 2' as a prerequisite, while ENGG531, with the same title, is offered in the BSME programme with MATH501 'Integral Calculus with Differential Equations' and PHYS502 'University Physics 2' as prerequisites. The Panel, thus, recommends that the College should review course prerequisites to ensure they are academically justified, and should provide students with appropriate course selection guidance through academic advising.

- The BSIE curriculum is reviewed in depth every three to five years. This review considers feedback from formal and informal benchmarking, external examiners, and alumni and employers. Feedback is reviewed by the PDC before changes are made and approved. One important source of feedback is from the EAC of ABET. This provides the Institution and its stakeholders with the confidence that the programme meets international standards. The Panel notes with appreciation the efforts invested in obtaining ABET accreditation for the BSIE programme.

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023 12

- The Panel appreciates the solid relations with relevant external stakeholders. This close relationship was evident through the interviews that the Panel conducted during the virtual visit, and which confirmed that requests made by the industry have resulted in curricular changes. One example given was the increase of the practical component in the programme, which has since then led to 61% of the courses having a laboratory component.

- The Panel noticed that the programme has significantly more credit hours compared to similar programmes internationally, thus considerably exceeding ABET and NQF minimum requirements. In terms of progression, this results in a long study period before graduation, which is approximately equivalent to 5.5 years. In addition, although the curriculum demonstrates an appropriate balance between theory and practice, and between knowledge and skills; it nevertheless contains required courses that are not necessarily related to informatics engineering. The Panel, thus, recommends that the College should better align the programme with international practice regarding its overall duration and its set of required courses.

- Apart from the courses that are not linked to informatics engineering, the curriculum's courses cover all topics and components expected in terms of depth and breadth and are enriched by the research findings of the faculty, who are guided in their research endeavours by UTB's research policy and Research Handbook. The textbooks and references relied on in the courses are relatively current, appropriate, and provide relevant information that is supplemented by the digital sources accessible through UTB's library.

Indicator 1.4: Teaching and Learning

The principles and methods used for teaching in the programme support the attainment of programme aims and intended learning outcomes.

Judgement: *Addressed*

- UTB has a well-defined teaching and learning policy that is comprehensive and promotes the use of various teaching and learning techniques to achieve the ILOs. The Panel noted from interviews that the policy has been effectively communicated to both faculty members and students of the BSIE programme. The courses' specifications were reviewed by the Panel, and it was observed that a satisfactory variety of teaching methods is used, with lectures being the primary mode of course delivery. Additionally, most of the BSIE programme core courses have laboratory components that are conducted in specialized and well-equipped laboratories. Also, some course materials indicate the use of in-class exercises, group projects, simulations, and case studies, wherever applicable.

- All learning that takes place on campus is augmented by Moodle as an eLearning platform. However, by inspecting samples of Moodle course contents, the Panel noticed that its usage is mainly limited to downloading course materials, formative assessments activities, assessments results and important announcements. The Panel, thus, suggests integrating more independent e-learning opportunities into the curriculum by leveraging Moodle.

- The programme employs various teaching methods and instructional activities that encourage independent and lifelong learning among students. Furthermore, a mandatory Work-Based Learning (WBL) component exposes students to real-world supervised professional training and practice. This is in addition to a two-trimester capstone project, which the Panel views as a successful method for enhancing students' research capabilities, as well as developing their creative and innovative skills. During the campus tour, the Panel visited the dedicated robotics and the capstone project laboratories where the students develop robotic solutions to participate in national and international student competitions. The Panel recognizes the significant learning opportunities provided by such competitions to students, promoting their lifelong learning abilities. The Panel, thus, appreciates the College's implementation of diverse teaching and learning methods aimed at fostering students' independent and lifelong learning skills.

Indicator 1.5: Assessment Arrangements

Suitable assessment arrangements, which include policies and procedures for assessing students' achievements, are in place and are known to all relevant stakeholders.

Judgement: *Addressed*

- The Panel notes that the BSIE programme adheres to the institutional Teaching, Learning, and Assessment (TLA) policy, which outlines the assessment framework. Moreover, there is evidence from the submitted documents and interviews that the assessment practices are strictly and consistently implemented in accordance with the decisions and regulations of the HEC. Grading guidelines are available to students through the online Student Handbook and course specifications. It is apparent from the interviews conducted with the students that they have a clear understanding of the criteria used for assessment and grading. The Panel was also informed during interviews with faculty that the assessment guidelines and procedures are discussed during their induction with their respective Programme Head.

- Upon reviewing the course specifications, the Panel noted that the marking criteria are clearly stated. The provided samples of Moodle course contents and of formative assessments indicate the implementation of formative assessments, with relevant performance feedback provided to students. The summative assessments are

accompanied by well-defined marking rubrics and grade distributions that vary based on the level and nature of the courses. The evidence gathered from the interviews and documents made available confirms also that all summative assessments are subjected to internal moderation and external examination/review. Based on interviews with students, the Panel found that instructors regularly provide prompt feedback to students regarding their progress and performance on assessments.

- The capstone project course exposes BSIE students to, and requires them to apply, scientific research principles. Each capstone project group is assigned a faculty member to supervise and guide the students on project requirements. The Panel learned that the capstone projects are evaluated through an oral presentation by a panel comprising two faculty members and an external examiner selected by the projects' coordinator. Furthermore, the submitted project reports must adhere to ethical and plagiarism requirements, as defined in UTB's research policy.

- UTB Teaching, Learning and Assessment (TLA) policy sets broad guidelines on the grading criteria, internal and external moderation. The Panel finds that the Policy on Moderation of Assessments provides comprehensive guidelines for conducting the moderation of assessments, which promotes fairness in grading students' achievements. From the samples of the internal moderation reports provided and interviews, there is evidence that all summative assessments are internally moderated. Also, samples of the corrected students answer booklets are moderated by a co-faculty in the programme to verify the correctness of the marks awarded to the students. The Panel reviewed the internal moderation feedback that has been documented in the moderation reports. The final examinations of all core courses are also annually moderated by external examiners selected based on their specialization.

- UTB has a policy in place to address academic and behavioral misconduct. When conducting interviews with faculty members, the Panel found that the University permits a certain level of similarity for submitted works, which reaches up to 20% using Turnitin anti-plagiarism software, and that penalties are applied when such percentage is exceeded. UTB also applies a Policy on Grade Appeal and samples of students' grade appeal requests and cases were submitted among the evidence.

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *15*

Standard 2

Efficiency of the Programme

The programme is efficient in terms of the admitted students, the use of available resources - staffing, infrastructure and student support.

Indicator 2.1: Admitted Students

There are clear admission requirements, which are appropriate for the level and type of the programme, ensuring equal opportunities for both genders, and the profile of admitted students matches the programme aims and available resources.

Judgement: *Addressed*

- The University has an admission policy and related procedures that are published for all stakeholders. The policy permits students with a 60% high school average or above into the BSIE programme and some of them are required to take remedial courses (two English courses and one Mathematics course) to better meet the admission requirements of the programme. However, students also have an opportunity to be exempted from the remedial English courses if they successfully pass an English placement test administered by the University. The Panel is satisfied with the admission policy and notes that most of the admitted students are employed, which makes them opt for enrolling in the evening sessions offered by the programme.

- The various nationalities of students and the number of female students to male students noticed during the campus tour confirmed to the Panel the equal opportunities provided by UTB for all the students.

- Regarding credit transfer, the University follows the HEC policy for credit transfer which allows the transfer of up to two-thirds (i.e., a maximum of 66%) of the required credit hours of the original degree programme of another university. The Panel found that even dismissed students from other universities are allowed to join the BSIE programme if successfully meeting the admission and/or credit transfer criteria, and that they can progress and graduate from UTB successfully.

- The Panel noticed a clear contribution from different stakeholders in the revision and development of the programme, including the admission policy, among them mainly members of the PIAP and the external examiners. The Panel was also informed that the programme has been benchmarked with local, regional, and international universities.

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 February-01 March 2023   *16*

However, there was no indication of the admission policy being revised in light of students' performance. Thus, the Panel recommends that the College should take previous students' performance and progression into consideration when reviewing the programme's admission policy.

Indicator 2.2: Academic Staff

There are clear procedures for the recruitment, induction, appraisal, promotion, and professional development of academic staff, which ensure that staff members are fit-for-purpose and that help in staff retention.

Judgement: *Addressed*

- Several documents and interview reports were provided to the Panel as evidence of clear policies and procedures related to faculty recruitment, induction, appraisal, and promotion. The recruitment process is transparent as it moves at different levels, starting from the Department to the Human Resources and then to the advertising of vacancies and applications, all the way to the approvals on the college and university levels.

- As for the induction of newly appointed faculty members, an orientation is provided at the beginning of each academic year at both the university and college level. In addition, the University provides mentoring for new staff members. The effectiveness of both the orientation and the mentoring is measured for improvement.

- The University has a clear policy for continuous staff development that is directly linked to faculty appraisal, as staff development needs are identified based on appraisal results which themselves are taken into account during the assessment of academic promotion applications. The staff development policy is translated into procedures and arrangements that help ensure that faculty members develop, improve, and progress further professionally and/or in their qualifications. The Faculty Development Office is responsible for this task and a list of professional development events attended by faculty members was provided to the Panel as evidence.

- The Panel notes that faculty members in the programme are sufficient in number and that the College of Engineering includes faculty experienced in diverse engineering and scientific subspecialities. The College includes 11 faculty members dedicated to the BSIE programme, of which seven are full-time and four part-time, to teach the specialized courses. Out of the 11, six hold a doctoral degree. In addition, there are 15 faculty members in the College who teach computing, mathematics, and science courses.

- The University follows the HEC regulations in assigning faculty workload, through which each full-time faculty member carries a load of 40 hours per week, distributed between teaching, research, and community engagement. The teaching load varies based on

academic rank but also depending on other circumstances such as administrative duties/special project assignments. Needs specific to female faculty members, such as those related to maternity leaves and nursing hours, are also accommodated in the programme when it comes to workload distribution.

- The Panel noticed a faculty retention rate of 85%, which the Panel finds to be a clear indication of the provision of mechanisms that encourage the highly qualified academic staff members to continue in the programme. Incentives to retain faculty include professional development opportunities as well as academic promotion and career progression prospects. Academic promotion is based on transparent criteria that include teaching, university and community service, professionalism, and scientific research publications.

- The Scientific Research Policy at UTB stipulates that all full-time faculty members conduct research that is aligned with the college's strategy and research priorities, and publish their research works in internationally recognized scientific journals. During the campus tour, it was observed that various laboratories and computer laboratories are equipped with sufficient machines, devices, and materials by which successful research work can be conducted with ease in a safe environment. The Panel was impressed with the robotics laboratories, in particular, which support scientific research and the participation in national and regional competitions, a few of which were actually won by UTB. In conclusion, the Panel appreciates the different types of support provided to encourage faculty members to conduct scientific research and present their research outcomes in scientific conferences.

Indicator 2.3: Physical and Material Resources

Physical and material resources are adequate in number, space, style and equipment; these include classrooms, teaching halls, laboratories and other study spaces; Information Technology facilities, library and learning resources.

Judgement: *Addressed*

- There is an adequate number of classrooms, which are spacious, air-conditioned, and equipped with projectors and white boards, with enough chairs for students and instructors' desks. Additional rooms for independent study, face-to-face advising, and/or capstone projects discussions are also available on campus.

- The laboratories were found to be well-equipped, with functioning devices and sufficient storage space for consumables that are required in experiments. Safety guidelines are posted in every laboratory and adequate safety measures are implemented. Emergency

plans are in place in case of unforeseen accidents and first aid kits are available in all laboratories.

- The staff offices are in a good condition and the Panel was informed during the campus tour that a new electronic communication system will be launched in the very near future, through which students will be able to book appointments with their faculty members using a digital screen at the door of each faculty member's office. This screen will display the faculty member's schedule, office hours, and any other relevant information. In addition, the Panel was presented during the tour with the university plan for facilities' development and expansion, which includes several sports facilities and social areas on-campus. The Panel advises the College to expedite the implementation of this plan, as the social and athletic facilities it will create can enrich student life considerably.

- The university library can accommodate 200 patrons at a time, and it contains a range of diverse books among them those relevant to the courses of the programme, some of which are very recent. The library provides several services, such as an online borrowing system, which facilitates the process of searching for, and checking out, books. Through this system, users can also access a wide range of electronic publications other than books, such as journals and reference materials. The library is supplemented by a separate digital library including online scholarly databases, such as: IEEE-ASPP, IEEE Online Standards, Computer & Applied Science Complete, and GreenFILE EBSCO.

- All computer laboratories are in good condition and include machines that are in operation. Necessary licensed software is installed on all computers and access to Wi-Fi is available at a high speed throughout the university campus. Moreover, there is a well-equipped open laboratory including all necessary software, which is accessible by students at any time during the working days.

- All students have university email addresses and have access to Moodle and Microsoft 365 remotely from any place, for ease of communication, information access, and e-learning purposes. As for online registration, viewing of grades, academic advising, and scheduling of classes, this is done through the students' gateway 'MyUTB'.

- The Facilities and Maintenance Department is responsible for the maintenance of all infrastructures, facilities, and equipment. This department applies strategies that, sufficiently, provide preventive, corrective, and statutory maintenance. During the campus tour, the Panel noted that the facilities and equipment are in good operational condition. However, the Panel detected some maintenance issues in the toilets intended for use by physically disabled individuals, which rendered them totally unusable. However, the senior management explained in interviews that all these facilities are in process of renovation and that they will be ready for use soon. Another issue relevant to special needs individuals was noticed by the Panel, and this was related to lack of wheelchair accessibility to the auditorium. The senior management assured the Panel of

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *19*

the plan to install an elevator in the very near future, which will facilitate direct access to the auditorium. The Panel, thus, recommends that the College should expedite the implementation of all maintenance and renovation plans that would facilitate mobility and accessibility for the physically disabled and any other special needs individuals.

- UTB gives special attention to health and safety matters and considers them as a high priority. This is reflected through the applied policies, which were evident to the Panel during the campus tour. Noteworthy of mentioning is the wide range of preparations that are in place, which demonstrate readiness to respond to any health and/or safety issue. Additionally, the Panel noted the availability of a fully operating clinic on campus; however, the Panel advises that the clinic be equipped with an additional private bed just in case a situation arises where a male and a female student seek medical attention at the same time.

Indicator 2.4: Management Information Systems

There are functioning management information and tracking systems that support the decision-making processes and evaluate the utilisation of laboratories, e-learning and e-resources, along with policies and procedures that ensure security of learners' records and accuracy of results.

Judgement: *Addressed*

- The University has an operational Management Information System (MIS) through which data is stored and transported in a systematic manner to enable appropriate decision making at different levels. The Campus Information System (CIS) and the Human Resources Management System (HRMS) are two main components, in addition to the e-library system and e-references monitoring system, which are all used effectively to manage information. The CIS, which includes the admission, registration, and grading systems, is used by the President, Vice Presidents, Deans, the Registrar, Admissions, Student Affairs, Counseling and Guidance, and faculty members for various decision-making purposes and for effective management of the academic programmes, through the many useful data reports generated by the CIS.

- The Panel reviewed a large sample of CIS generated reports as well as utilization tracking reports that demonstrate reporting features that are helpful in the extraction of statistical data and related information, which is effectively used in the implementation of appropriate managerial actions.

- The e-learning system (Moodle) adopted by the University as well as the Online Public Access Catalogue (OPAC) are also regularly monitored by the Information and Communication Technology (ICT) Department for tracking usage information that can aid in decision-making.

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *20*

- The Panel notes that learners' records are kept secure as per university policy and that the security, confidentiality and integrity of the records are always maintained. During the campus tour, the Panel visited the Admission and Registration Office and noticed restricted access to the Office. The Panel was informed that, in addition to the printed records, the University keeps secure electronic records, access to which is granted through the ICT Department to specific individuals with specified privileges depending on their positions and roles.

- The Panel is satisfied with the security of student records in place and with the electronic backup of data on external hard disks and on a third-party cloud storage. The backups are done every few hours, on a daily basis, weekly basis, and monthly basis. The ICT Department is responsible for the backups, and it abides by a Disaster and Recovery Policy to secure learners' records and maintain accuracy of results.

- The University implements the Policy on Eligibility for Graduation before awarding any formal qualification. The Panel was informed that the procedures of results' preparation, verification, auditing and release of transcripts and certificates or any other related documents are covered in this policy. The results are reviewed at many points before they are released to students. Furthermore, any grade correction must go through strict official procedures before it is changed in the system. The certificates are issued with precise specifications and are assured to be genuine and protected against fraud. All certificates are verified internally by UTB and externally by the HEC.

Indicator 2.5: Student Support

There is appropriate student support available in terms of guidance, and care for students including students with special needs, newly admitted and transferred students, and students at risk of academic failure.

Judgement: *Addressed*

- The University has adequate student support services policy and procedures that are satisfactorily applied. The Deanship of Student Affairs provides administrative and academic support in coordination with the colleges and other parties within the University. New students, including transferred students, are inducted by the Office of Student Services in the beginning of the trimester in which they are admitted. The induction covers a wide range of information that includes policies and procedures on registration, grading, graduation requirements, ICT and library services, and the like. Most of what is covered in the induction is available in the University Handbook and on the university website, which also provides other useful information and announcements for the students, such as the academic calendar and important dates.

- Evidence submitted to the Panel as well as information reported in interviews and during the campus tour confirmed to the Panel that the University provides a variety of services to students, including library services, laboratories and ICT services, social counseling and engagement, and career guidance. In addition to that, the Deanship of Student Affairs, through the students' clubs and the Student Council, organizes social, sports and cultural activities in coordination with internal and external entities, which helps in developing students' soft skills and providing them with a better student life experience. During the interviews with the support staff members from different services (e.g., the library, ICT Department, laboratories, career guidance, etc.), the Panel noted their keenness and readiness to provide students with continuous support. The students themselves also expressed in interviews a high degree of satisfaction with the support they receive from various technicians and specialists working in the College.

- Both female and male students are equally supported in the programme and are provided with equal opportunities when it comes to voicing their opinions through representation in the Student Council or any other student club or committee. The University also takes into consideration the specific needs of women, where necessary, and for this reason it has made available for them a dedicated lounge to ensure their privacy.

- The University also provides adequate support to academically at-risk students mainly through the role played by the academic advisors. This entails first the identification of students at risk as soon as they fail a test or begin struggling in a course. Once identified, the University schedules tutorials for them as remedial measures, in an attempt to reduce the number of (or even better to completely eliminate) at-risk students in the programme. Through the help of the academic advisors, reports are also prepared in every trimester listing delinquent students and showing their progress/regression. These reports are discussed in the relevant councils before any major decisions such as interventions and/or dismissal from the programme are taken. The Panel finds the monitoring, support, and interventions implemented in the case of at-risk students suitable.

- When it comes to special needs students, the University ensures that they receive proper care and guidance through the Guidance Office. Assistance is offered to this group during admission and also during the course of their studies and examinations. Forms of support for the students with special needs include the provision of left-handed desks, elevator handles, extended examination time, and special tutorials if needed.

- All support services provided to students are regularly evaluated through surveys, such as the Student Satisfaction Survey and the Senior Exit Survey. Analysis survey reports indicate students' general satisfaction toward support services provided to them at the level of the programme and the University.

<div style="border:1px solid #000; padding:10px;">

Standard 3

Academic Standards of Students and Graduates

The students and graduates of the programme meet academic standards that are compatible with equivalent programmes in Bahrain, regionally and internationally.

</div>

Indicator 3.1: Efficiency of the Assessment

The assessment is effective and aligned with learning outcomes, to ensure attainment of the graduate attributes and academic standards of the programme.

Judgement: *Addressed*

- Upon reviewing the UTB Policy on Assessment of Learning Outcomes, the Panel noted that it provides a comprehensive assessment framework at all levels, ranging from institutional to programme and course levels. At the programme level, the attainment of the PILOs is evaluated through a combination of direct assessments through the courses' assessment tools and indirect assessments *via* self-evaluation in the form of surveys. Upon examining the courses' specifications, the Panel noticed that the assessment methods used are clearly specified and connected to the CILOs, which are subsequently linked to the PILOs. Moreover, samples of the summative assessments were reviewed, and it was found that each examination is mapped to the related CILO. The Panel notes the effective implementation of good assessment practices, which are aligned with the academic standards of the programme and are appropriately challenging in terms of their complexity level.

- The Panel reviewed the Curriculum Review Committee (CRC) annual reports, which provide evidence of the evaluation and assessment of PILOs, and noted the utilization of various evaluation mechanisms to ensure that assessments are aligned with learning outcomes and graduate attributes, and that graduate achievements meet the ILOs. These mechanisms include aggregated CILO Evaluation Reports from all courses, Practicum Competency Evaluation forms gathered from the work-based industrial training course, Competency Evaluation of the capstone project, and the Senior Exit Surveys.

- The Panel notes that the evaluation of the assessment processes is the responsibility of several bodies that are involved in the quality assurance and management of the programme, such as the faculty, Programme Head, Programme Development Committee (PDC), the CRC, and the college Committee on Continuous Quality Improvement (CQI). Based on the evidence provided and interviews conducted, it can be inferred that the

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023 23

mechanisms for monitoring the implementation and improvement of the assessment process are consistently implemented, monitored, and subjected to regular reviews.

Indicator 3.2: Academic Integrity

Academic integrity is ensured through the consistent implementation of relevant policies and procedures that deter plagiarism and other forms of academic misconduct (e.g., cheating, forging of results, and commissioning others to do the work).

Judgement: *Addressed*

- The Institution has processes, procedures, and tools in place to proactively address possible issues related to academic integrity. The Student Handbook contains an extensive section on student discipline addressing 30 categories of violations, one of which is cheating or other acts of plagiarism, together with their penalties. In addition, a shorter document, the Policy on Student Grievance, and Academic and Behavioural Misconduct provides high-level guidance on the procedure of investigating alleged cases of violation of academic integrity. Similarly, the Faculty Manual contains the 'Disciplinary Policy' for members of the faculty. Plagiarism and other violations of intellectual property rights can be a cause for a faculty member's termination.

- To detect plagiarism, written student assignments must be submitted through Turnitin, as was reported in both faculty and student interviews. The Institution defines a maximum similarity threshold level of 20% and allows students to resubmit their assignments in cases where the 20% similarity is exceeded.

- Students and faculty members learn about the institution's regulations regarding plagiarism and academic misconduct through the relevant policies and the induction sessions/programmes. The Panel found in interviews widespread awareness of academic integrity policies and procedures.

- The formally recorded cases of academic misconduct, which the Panel received, follow the Operations Manual called 'Student Grievance, and Academic and Behavioral Misconduct', which requires the establishment of a Student Disciplinary Committee (SDT) in cases of suspected misconduct. The Panel was also provided with evidence that plagiarism is being reported and appropriately addressed through meetings with the concerned parties and the implementation of penalties

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *24*

Indicator 3.3: Internal and External Moderation of Assessment

There are mechanisms in place to measure the effectiveness of the programme's internal and external moderation systems for setting assessment instruments and grading students' achievements.

Judgement: *Addressed*

- The Institution makes use of internal and external moderation of assessments. Internal moderation reviews adequacy and correctness of assessments (pre-moderation) as well as fairness of grading (post-moderation) to ensure relevant professional and academic standards are being met. It is carried out by course coordinators and specialization coordinators who are selected by the Programme Head and who review summative assessments and provide feedback using a template. Evidence of pre-moderation was submitted in the IQA Summary Report on Pre-Moderation of Assessments.

- After the assessment is conducted, internal post-moderation verifies that marks have been awarded according to the marking criteria and that appropriate feedback is given to students. Typically, for sections with more than 10 students, 50% of the assessment papers are moderated, including all failed examination sheets and samples of high, medium, and low-performing students. If differences in grades cannot be resolved, another marker is selected by the Programme Head.

- External moderation takes place before and after the assessment is conducted. External moderators are selected based on their expertise. Currently, the College has a total of four external examiners for the BSIE programme: one for the overall programme, one for the BSIE professional courses, one for engineering courses, and one for mathematics and science courses. The Panel learned in interviews that some of the external examiners have been serving in this role for several years.

- The Panel received evidence that external moderators consistently provide feedback as part of the pre-moderation process. The same is valid for external post-moderation. However, upon careful evaluation of the external moderators' reports provided, the Panel found that, in general, the feedback given regarding the thoroughness of the assessment methods and fairness is in the form of generic statements that are applicable to all examined course portfolios. Hence, the Panel concluded that the external moderators' feedback regarding the thoroughness and fairness of assessments seems to have a negligible impact. Thus, although the effectiveness of the moderation process (both internal and external) is evaluated annually, involving the Programme Head, the CQI, and the College Council; the Panel recommends that the College should review and develop the mechanisms in place for the evaluation of the effectiveness of the programme's external moderation, to ensure the adoption of more detailed and meticulous external moderation of assessments.

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *25*

Indicator 3.4: Work-based Learning

Where assessed work-based learning takes place, there is a policy and procedures to manage the process and its assessment, to assure that the learning experience is appropriate in terms of content and level for meeting the intended learning outcomes.

Judgement: *Partially Addressed*

- The BSIE programme mandates that students undertake a six-credit internship or WBL programme presented as an 'Industrial Attachment' (IENF861) course. Procedures for managing the internship process are outlined in the university's WBL Handbook, which also defines the roles and responsibilities of WBL academic supervisors, students, and industry training supervisors, to ensure proper coordination and accountability throughout all WBL activities.

- During the interviews, feedback from students, alumni, and industry training supervisors indicated that they have all undergone appropriate orientation in relation to the WBL procedures, the evaluation of students' performance, and the monitoring process by both academic and field supervisors.

- The Panel noticed that the WBL assessment system is being implemented consistently, as demonstrated by the provided documentation. The final grade of the 'Industrial Attachment' course is divided into three parts: 50% for the industrial supervisor's evaluation, 20% for the internship coordinator's evaluation, and 30% for the Practicum Accomplishment Report, which is submitted by the student upon completion of the internship period.

- The internship course is a key component of the BSIE programme and is used in directly assessing the PILOs, as stated in the policy on the assessment of learning outcomes. This is implemented through the mapping of the internship CILOs to the PILOs.

- As per the 2022-2023 BSIE curriculum plan, the 'Industrial Attachment' course, is scheduled for the third trimester of the fourth year. This course necessitates a minimum of 240 hours of training in a related work environment. Concurrently, the course is offered with another course, namely IENF862, which is the 'Informatics Engineering Design Project B'. Based on the Panel's view, students pursuing both a capstone project and an internship programme may experience challenges in managing the workload effectively. The Panel believe that this could lead to a situation where the students may find it difficult to complete the capstone project's requirements while giving enough attention to their internship programme, which could lead to unsatisfactory performance and an inability to meet the expected learning outcomes of both courses. On a related note, the internship can serve as a gateway to employment opportunities and offering it earlier in the BSIE programme would allow students to gain a deeper understanding of the industry and its

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 February-01 March 2023
26

practices, which can enhance their academic learning and career readiness. The Panel thus recommends that the College should carefully review the 'Industrial Attachment' course in terms of when and how it is offered, to ensure that students are able to attain the learning outcomes effectively and efficiently.

Indicator 3.5: Capstone Project or Thesis/Dissertation Component

Where there is a capstone project or thesis/dissertation component, there are clear policies and procedures for supervision and evaluation which state the responsibilities and duties of both the supervisor and students, and there is a mechanism to monitor the related implementations and improvements.

Judgement: *Addressed*

- The capstone project is a mandatory course for all students enrolled in the BSIE programme. There is an institutional policy that outlines the policy and procedures for running the capstone project which clearly states the roles and responsibilities of the supervisor and the students.

- The BSIE programme offers the capstone project as two courses, namely 'Informatics Engineering Design Project A' (IENF855) and 'Informatics Engineering Design Project B' (IENF861). According to the course specifications of both courses, the capstone projects' learning outcomes contribute to the attainment of all BSIE PILOs.

- Students usually work in groups of three- to-five and each group is assigned to a faculty member to supervise their project. The capstone project is assessed by a panel consisting of two faculty members and an external examiner. The final grade awarded for the capstone project depends on the submitted project report, project prototype and the oral presentation.

- During the campus tour, the Panel was able to see prototypes of the capstone projects implemented by the BSIE students. The Panel also reviewed samples of capstone project reports and is satisfied with the scope, level, and contents of the projects, and finds them to be comparable to those of equivalent programmes.

- During interviews, students confirmed that they gain valuable hands-on design experience, soft skills, such as communication skills and teamwork, as well as exposure to solving real world problems. The Panel appreciates the quality of education imparted onto students through the two capstone project courses.

- In line with continuous improvement, the capstone project process is evaluated upon its completion through the administration of surveys that measure students' satisfaction with the supervision and support provided to them by the College. The survey results are relied

upon in the annual review of the programme and lead to improvements in the capstone process.

Indicator 3.6: Achievements of the Graduates

The achievements of the graduates are consonant with those achieved on equivalent programmes as expressed in their assessed work, rates of progression and first destinations.

Judgement: *Addressed*

- The BSIE programme uses the seven SOs suggested by EAC of ABET to define the skillset to be achieved by graduates. This contributes to graduates achieving internationally accepted benchmarks at the time of graduation. Furthermore, the educational objectives of the BSIE programme define what graduates are to achieve within a few years after graduation. Furthermore, formal and informal benchmarking exercises provide a comparison between the BSIE programme and similar programmes elsewhere. Moderation processes provide feedback from academics on the quality of students' works and the level of difficulty. Collectively, all this constitutes an approach that enhances the programme's confidence that its graduates achieve knowledge and skills commensurate with local, regional, and international standards.

- The achievement of SOs is assessed using direct and indirect assessment tools *via* taught courses, the design project courses, the WBL experience, and the Senior Exit Survey. Although there is a variation of results measured by these different assessment tools, trends are consistent, indicating a mature assessment process. In interviews, the Panel received positive feedback from employers and alumni on the quality of graduates' knowledge and skills, thus, indicating overall satisfaction with the programme.

- The Panel notes with appreciation that the College strongly encourages and supports BSIE students' participation in local and international competitions. As a result, BSIE students have done exceptionally well, winning Huawei ICT competitions at various levels every year since 2018. Student groups also participated in the World Robot Olympiad, the Institution of Engineering and Technology (IET) GCC Robotics challenge, various programming competitions, and other similar contests.

- The Panel notes that students' progression rates are, on average, slightly longer than typical values. The Panel is of the view that this is likely caused by (1) most students being in full-time employment, and (2) the programme having an unusually large number of credit points (see the Panel's Comments in Indicator 1.3). The Panel recommends that the College should investigate ways of improving students' progression rates.

<div style="border: 1px solid black;">

Standard 4

Effectiveness of Quality Management and Assurance

The arrangements in place for managing the programme, including quality assurance and continuous improvement, contribute to giving confidence in the programme.

</div>

Indicator 4.1: Quality Assurance Management

There is a clear quality assurance management system, in relation to the programme that ensures the institution's policies, procedures and regulations are applied effectively and consistently.

Judgement: *Addressed*

- The university Operations Manual contains clear policies and procedures for managing the BSIE programme, including mechanisms for quality assurance and accreditation. All these policies and procedures are available on the university website for relevant stakeholders. Furthermore, they are discussed with stakeholders at different events intended for the development and improvement of the programme.

- The Panel found that there is an effective Quality Management System at UTB. The system structure consists mainly of three entities with identified responsibilities. These are the University Continuous Quality Improvement Committee (UCQIC), which is chaired by the President of the University and reports to the University Council; the Quality Assurance and Accreditation Department (QAAD) that reports to the President; and the College Committee for Quality Improvement (CCQI) which reports to the College Dean and the QAAD for all issues related to quality assurance and accreditation. The Panel finds that these structures are effective, as the submission of the SER and the supporting materials indicates a high level of professionalism of quality assurance work.

- The College has clear plans for improvement that are in line with the university strategic plan. The college officers are responsible for effective implementation of all the plans to maintain continuous quality improvement. The Planning and Development Department (PDD) regularly monitors plans at the institutional, college and committee levels and receives related periodic accomplishment reports. Each report is reviewed by the responsible entity, for verification and assessment of the level of success of the implementation of quality assurance policies. This mechanism cannot be successful without all entities understanding their roles within the quality assurance system at all levels, and the Panel finds the quality assurance policies and procedures to be effectively implemented. The Panel thus trusts that the quality assurance culture is well-spread at UTB. What helps with this is that several quality assurance activities are regularly

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 February-01 March 2023   *29*

organized for various related items, to help increase the awareness of all staff members about quality assurance matters. Such activities and shared awareness, help in getting everyone on board for improvement contribution.

- The quality assurance management system is monitored internally and externally for evaluation and improvement. Different stakeholders contribute with useful feedback that usually leads to improving the effectiveness of the quality assurance management system.

Indicator 4.2: Programme Management and Leadership

The programme is managed in a way that demonstrates effective and responsible leadership and there are clear lines of accountability.

Judgement: *Addressed*

- The university management was changed in 2021 as part of the rebranding strategy. This impacted the college organizational structure and the programme leadership directly and indirectly. The Panel is satisfied with the clear organizational chart that shows the reporting lines between different parties, including committees and councils and other stakeholders. Such structure provides a platform for effective communication at all the different levels of decision making, which is to the advantage of the academic programmes on offer.

- The custodianship of the academic standards of all engineering programmes, including the BSIE, lies with the main role-players within the College of Engineering, who are the Dean, Associate Dean, Programme Head, and faculty members. The role and responsibilities of each party in the College are defined in their job descriptions, and the Panel finds that the communication between these parties and the college committees and relevant stakeholders is adequate.

- The College Dean reports directly to the Vice President for Academic Affairs and represents the College in the University Council, for which there are clear terms of reference. Similarly, terms of reference are in place for the College Council and the different committees, whether at programme or department or college level.

- Considering the various responsibilities, there is adequate harmony between the different parties serving the BSIE programme. The level of coordination between the College Dean, the Associate Dean, the Programme Head, the Committees, the Course Coordinators, the Course Instructors, the technicians, the administrative staff, and the remaining stakeholders, as well as the successful operation of the programme, reflect a culture of shared responsibility and an effective and responsible leadership on the part of the management, which is capable of promoting further developments in the programme.

Indicator 4.3: Annual and Periodic Review of the Programme

There are arrangements for annual internal evaluation and periodic reviews of the programme that incorporate both internal and external feedback and mechanisms are in place to implement recommendations for improvement.

Judgement: *Addressed*

- The University has a clear policy for programme development, review, and enhancement, which forms the basis for the generation of the BSIE programme's Annual Programme Report and the periodic Self-Evaluation Survey (SES).

- The annual report is submitted to the Vice President for Academic Affairs and the analysis of its contents leads to recommendations, resulting in an improvement plan that usually gives special attention to the PILOs with lower achievement rates. Survey results analyses also feed into the annual report, thus, identifying potential areas of improvement based on respondents' feedback. On the level of the programme's courses, the CRC conducts a review for each course of the programme based on its submitted course file/portfolio. This is done in coordination with the course coordinator and the faculty members who delivered the course. The review focuses on the currency of the course, the achievement of the learning outcomes and the appropriateness of the TLA methodologies. The outcomes of the CRC review are taken with the feedback of the external examiners, in addition to the observations taken from benchmarking with similar courses elsewhere, and then used to set recommendations for improvement, which can be applied in the upcoming trimester.

- The annual report helps the Senior Management of the programme decide on any corrective actions needed to be taken in the programme and its courses on an annual basis. The annual report also includes an Alumni Tracer Study, which is a useful tool for improving the programme's graduate attributes, so as to increase the employability of future graduates.

- As a periodic review, an SES and related analysis is conducted based on three-years cohort data for retention, progression, and graduation rates. The SES is conducted in reference to the BQA-DHR standards and expectations, which yields a comprehensive review of the programme including feedback from internal and external stakeholders, including the PIAP. This helps in identifying areas of improvement for the standards that appear to be not met or only partially met in the programme.

- The CQI and the QAAD are responsible for monitoring the implementation of the recommendations resulting from the APR and the SES, while reporting to the College Dean on the progress of implementation. From the interviews and the evidence provided (e.g., Course Review Reports, Annual Programme Reports, the BSIE SES, Programme

Review Summary Report, College Council Approval on Programme Revision, and Programme Review Improvement Plan Status Report), the Panel is convinced that the mechanisms for monitoring the implementation of annual and periodic review recommendations are adequate.

Indicator 4.4: Benchmarking and Surveys

Benchmarking studies and the structured comments collected from stakeholders' surveys are analysed and the outcomes are used to inform decisions on programmes and are made available to the stakeholders.

Judgement: *Addressed*

- The University has a benchmarking policy that governs all formal and informal benchmarking activities of the programmes with other similar local, regional, or international programmes. This policy was lately revised to make the benchmarking process more useful for the improvement of the BSIE programme, its services, and facilities. This policy revision and its implementation yielded results that led to the redesigning of some courses in terms of TLA.

- The College of Engineering conducted two formal benchmarking activities with a regional and an international university. The comparison between the UTB programmes benchmarked and the two other programmes shows a high percentage of similarity, especially in general TLA methodologies, the use of the Virtual Learning Environment (VLE), maintained subscriptions to print and online database, the use of smart boards and LCD projectors, the use of a wide array of simulation equipment and benchtop workstations, and completion of the capstone project and internship for graduation.

- The Panel found that the information obtained from the benchmarking exercise was utilized in effective ways leading to improvements. An indication of this is the addition of a new laboratory in 2019 where latest National Instrument (NI) and electrical modules like IIUM set-up were purchased. Recently, the University initiated communications with other institutions in Japan and the United Kingdom to widen the benchmarking circle for the benefit of the programme and the other engineering programmes at UTB.

- Some local benchmarking has also taken place, through which library services and learning resources were compared. The results were analysed by a specialized committee and a set of recommendations were made. Informal benchmarking with local, regional, and international universities that offer, ABET-EAC accredited, similar programmes is also in place.

- With respect to collecting structured comments that inform decision-making in the BSIE programme, the College conducts, in addition to the course evaluation survey at the end

of each trimester, several surveys to receive feedback from internal and external stakeholders. These surveys are administered as per the relevant policy and procedures specified in the Survey Manual. In addition, there are more surveys conducted by the Institutional Research Office (IRO) on different entities in the University and the College, and the outcomes are analyzed for the purposes of improvement and advancement of the academic programmes, services, and facilities.

- The results and analyses of the surveys are published and shared in different ways with all internal and external stakeholders, including the PIAP members, whose feedback contributes greatly to decision-making on the programme. The survey results of all internal and external stakeholders shared with the Panel indicate a general satisfaction with the University, the College and the BSIE programme. Recommendations resulting from the survey analyses are implemented and satisfaction with them is measured in the following year's surveys.

Indicator 4.5: Relevance to Labour market and Societal Needs

The programme has a functioning advisory board and there is continuous scoping of the labour market and the national and societal needs, where appropriate for the programme type, to ensure the relevancy and currency of the programme.

Judgement: *Addressed*

- The programme has an active PIAP that plays an important role in steering the programme to meet the labour market needs, by making sure that the programme is relevant, up-to-date, and responsive to the current and future demands. In addition to a few faculty members, the PIAP is composed of three employers, a member from a professional society/organization, and an alumnus.

- The minutes of the PIAP meetings indicate that it is active in the continuous improvement of the programme in terms of the PEOs, PILOs, curriculum, research orientations, and community engagement activities. An example of a recommendation of the PIAP that is implemented in the programme is the update of the elective courses list to include Artificial Intelligence and Cloud Computing in the 2022-2023 curriculum, to respond to the recent labour market needs.

- From the Panel's meeting with the PIAP, it was clear that the PIAP is making suggestions and recommendations that are placed in action in coordination with responsible parties in the University only after approvals are obtained from the University at the appropriate level. This assures the Panel that there is an appropriate mechanism for receiving suggestions and recommendations and then processing them for approval and implementation, to be later reviewed for evaluation purposes, which is a healthy practice.

- The University conducted two market scoping reviews in 2015 and 2021 to study the relevance of the programme to the labour market and its currency. The studies covered both the public and private sectors in Bahrain and the Eastern Province of the Kingdom of Saudi Arabia. The recommendations of both studies were passed for decision-making and for implementation in the next two academic years following the reviews. To ensure consistency of implementation of the market scoping studies, the PDC and the CRC monitored all related mechanisms to confirm that they are implemented in accordance with the university's policies, as was evident from relevant minutes of meetings.

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023 *34*

V. Conclusion

Taking into account the institution's own self-evaluation report, the evidence gathered from the interviews and documentation made available during the virtual site visit, the Panel draws the following conclusion in accordance with the DHR/BQA *Academic Programme Reviews (Cycle 2) Handbook, 2020*:

There is Confidence in the Bachelor of Science in Informatics Engineering of the College of Engineering offered by the University of Technology Bahrain.

In coming to its conclusion regarding the four Standards, the Panel notes, *with appreciation*, the following:

1. The efforts invested in obtaining Accreditation Board for Engineering and Technology accreditation for the programme.

2. The solid relations with relevant external stakeholders.

3. The College's implementation of diverse teaching and learning methods aimed at fostering students' independent and lifelong learning skills.

4. The different types of support provided to encourage faculty members to conduct scientific research and present their research outcomes in scientific conferences.

5. The quality of education imparted onto students through the two capstone project courses.

6. The College 's strong encouragement and support of the Bachelor of Science in Informatics Engineering programme's students' participation in local and international competitions.

In terms of improvement, the Panel recommends that the College of Engineering of the University of Technology Bahrain should:

1. Review course prerequisites to ensure that they are academically justified and provide students with appropriate course selection guidance through academic advising.

2. Better align the Bachelor of Science in Informatics Engineering programme with international practice regarding its overall duration and its set of required courses.

3. Take previous students' performance and progression into consideration when reviewing the programme's admission policy.

4. Expedite the implementation of all maintenance and renovation plans that would facilitate mobility and accessibility for the physically disabled and any other special needs individuals**.**

5. Review and develop the mechanisms in place for the evaluation of the effectiveness of the programme's external moderation, to ensure the adoption of more detailed and meticulous external moderation of assessments.

6. Carefully review the 'Industrial Attachment' course in terms of when and how it is offered, to ensure that students are able to attain the learning outcomes effectively and efficiently.

7. Investigate ways of improving students' progression rates.

BQA

Academic Programme Reviews – University of Technology Bahrain – College of Engineering - Bachelor of Science in Informatics Engineering – 27 Februrary-01 March 2023   *36*