هيئة جودة التعليم والتدريب
Education & Training Quality Authority
Kingdom of Bahrain - مملكة البحرين

Directorate of Higher Education Reviews

Academic Programme Reviews

Applied Science University
College of Arts and Science
Bachelor in Computer Science
Kingdom of Bahrain

Site Visit Date: 28 – 29 September 2020

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Acronyms

APR	Academic Programme Review
APRR	Annual Programme Review Report
ACM	Association for Computing Machinery
ASU	Applied Science University
BCS	The Bachelor in Computer Science
BQA	Education & Training Quality Authority
CER	Course Evaluation Report
CGPA	Cumulative Grade Point Average
CILO	Course Intended Learning Outcome
CQAAU	College Quality Assurance and Accreditation Unit
DHR	Directorate of Higher Education Reviews
HEA	Higher Education Academy
HEC	Higher Education Council
HEI	Higher Education Institution
HoD	Head of Department
HR	Human Resources
ICT	Information and Communication Technology
IEEE	Institute of Electrical and Electronics Engineering
ILO	Intended Learning Outcome
KM	Knowledge Management
KPI	Key Performance Indicator
LTA	The Learning, Teaching and Assessment
MEU	Measurement & Evaluation Unit
MoE	Ministry of Education
MoU	Memorandum of Understanding
NQF	National Qualifications Framework

PD	Professional Development
PILO	Programme Intended Learning Outcome
PRAR	Programme Reflective Analysis Report
QA	Quality Assurance
QAAC	The Quality Assurance and Accreditation Centre
SER	Self-Evaluation Report
ToR	Terms of Reference

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 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 judgments 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 judgment, 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	

The APR Review Report begins with providing the profile of the Programme under review, followed by a brief outline of the judgment received for each the 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.

II. The Programme's Profile

Institution Name*	Applied Science University
College/ Department*	College of Arts and Science
Programme/ Qualification Title*	Bachelor in Computer Science
Qualification Approval Number	-
NQF Level	8
Validity Period on NQF	-
Number of Units*	45 Units
NQF Credit	548 Credits
Programme Aims*	**1.** to produce graduates who have an up to date knowledge and understanding of Information and Communication Technology (ICT) which is relevant to the needs of industry. **2.** to ensure graduates have practical experience in the analysis and design of application and their associated tools and technologies which are used in the development of computer-based systems individually and in a team. **3.** to prepare graduates who understand the need to continually update their skills and knowledge, and rapidly developing subject area using research in order to meet their full potential throughout their career. **4.** to develop graduates who are reflective learners and understand the importance of research and critical thinking to identify and pursue an evidence based approach to develop and improve current systems or methods of working both independently and as part of a team, and to be able to communicate this clearly and effectively to diverse audiences. **5.** to foster graduates' personal development in the GCC society and contribute positively in a socially responsible and ethical manner and

	in particular understand the ethical dimensions which impact on the development and use of computer-based systems.
Programme Intended Learning Outcomes*	**A. Knowledge and Understanding** A1) Demonstrate a critical knowledge and understanding of computing theories and mathematics concepts appropriate to the discipline. A2) Demonstrate critical practical knowledge of programming languages, tools, and techniques used to develop computer-based applications in a wide range of familiar and ill-defined contexts. **B-Subject Specific skills (Including practical skills)** B1) Use specialist level skills to apply mathematical foundations, algorithmic principles, and computer science theory in problem solving in varying complexity. B2) Use specialist level skills to apply design, development and testing principles in the construction of software systems in a way that demonstrates comprehension of the trade-offs involved in design choices. **C. Critical Thinking skills** C1) Critically analyse computing problems in various context to identify the computing requirements appropriate to their solution. C2) Use a wide range of approaches to critically identify and evaluate computing-based solutions to meet the desired needs within realistic constraints. **D- General and transferrable skills:** D1) Use special skills to communicate with peers and specialists in the field of Computer Science adapting the message to the audience and making appropriate use of ICT when making formal presentations. D2) Operate autonomously at a specialist level to demonstrate individual ethical, legal, and social responsibility required to lead or participate in group projects to show leadership skills with the capacity to undertake lifelong learning.

* Mandatory fields

III. Judgment Summary

The Programme's Judgement:

Confidence

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	Partially Addressed
Indicator 1.3	The Curriculum Content	Addressed
Indicator 1.4	Teaching and Learning	Partially Addressed
Indicator 1.5	Assessment Arrangements	Addressed
Standard 2	**Efficiency of the Programme**	**Satisfied**
Indicator 2.1	Admitted Students	Partially 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	**Standard 3: Academic Standards of Students and Graduates**	**Satisfied**
Indicator 3.1	Efficiency of the Assessment	Partially Addressed
Indicator 3.2	Academic Integrity	Partially Addressed
Indicator 3.3	Internal and External Moderation of Assessment	Addressed
Indicator 3.4	Work-based Learning	Addressed
Indicator 3.5	Capstone Project or Thesis/Dissertation Component	Addressed

Indicator 3.6	Achievements of the Graduates	Partially 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.

Judgment: Addressed

- The Bachelor in Computer Science (BCS) was licensed by the Prime Minister's Decree Number WD 140/2004 on July 5th 2004, thus, it is in compliance with existing license regulations. The Panel acknowledges that the programme has been well designed and there is a clear evidence that typical best practices for academic programme development were followed. For instance, the Programme Intended Learning Outcomes (PILOs) are linked to the programme aims, which in turn are linked to the college mission and vision. These in turn are mapped to the University's mission and vision. In addition, the aims of the BCS programme are linked to the ASU Graduate Attributes.

- The HEI has an academic planning framework in place. This framework consists of the Learning, Teaching and Assessment (LTA) Strategy, which outlines principles for quality in education and emphasizes the three core strategies, namely Teaching and Learning, Research and Community Engagement. Another component of the planning process of programmes is contained in the New Programme Development Policy and Procedures; this policy acts as a guide for programme developers to ensure the programme is relevant, fit for purpose and complies with existing regulations. Furthermore, mappings to the National Qualifications Framework (NQF), benchmarking, market research, competitor analysis, and a detailed programme description are also tackled in this policy.

- The HEI has a Risk Management Policy that comprehensively addresses risks and requires the regular updating of several risk registers. This system is being reviewed annually. Risk registers exist at the university and college level. Given the current size of the Institution, it is appropriate that no risk register exists at the departmental level. The Panel received evidence showing the adjustment made to the risk register, in particular at the onset of the Covid-19 pandemic. Although the policy is very detailed, it uses impractical definitions

when it comes to the determination of the likelihood of the occurrence of a risk. For instance, it is unclear how ASU determined that the risk of 'Failure to obtain the HEC accreditation' has a 2% likelihood rather than a 5% likelihood. Using a percentage value implies a precision that is not possible for most risk descriptors in the University Risk Register. This could be an area of improvement during the next review of the policy.

- The BCS programme has recently (January 2020) applied for placement on the NQF. The internal processes required by the NQF Manual have been followed and evidence has been provided that the Mapping Panel and the Confirmation Panel carried out their work as intended. Minutes of meetings of the two panels show an effective, iterative approval process that includes valuable feedback from the Confirmation Panel to the Mapping Panel in order to identify the correct NQF level of all courses. The application to the General Directorate of National Qualifications Framework and Examinations contains the required mappings.

- The qualification title is concise and follows standard terminology. It clearly states its level (i.e., Bachelor) and subject area (i.e., Computer Science). The same title is consistently used on the HEI's website, college handbook and certificate.

- Programme aims are defined and appropriate for the programme in regard to its level and subject matter. A review of the programme aims occurred in 2017/2018 and resulted in the amendment of two aims, putting greater emphasis on design, teamwork and research, which are all aspects relevant to Computer Science. The next review is scheduled for 2020/2021. The Panel recommends that during the upcoming review, the HEI shortens the programme aims by removing some of the details to better differentiate them from the PILOs.

- The programme aims are clearly mapped to the university's mission as well as to the college's mission. However, it should be noted that the aims of the computer science programme are limited to the region, while the university mission emphasizes global aspects in addition to regional aspects. The Panel recommends that the HEI improve the alignment between the regionally focused programme aims and the globally focused university mission.

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.

Judgment: Partially Addressed

- The HEI has eight graduate attributes at university level. The attributes are refined and described in more detail in the supporting statements. An appropriate mapping between PILOs and the university graduate attributes exists.

- In addition, the programme itself has eight PILOs. Two outcomes are specified in each of the four areas, namely Knowledge and Understanding, Subject Specific Skills, Critical Thinking, and General and Transferrable Skills. The requirements for the definition of outcomes for all programmes and courses at the Institution is given in the LTA Strategy.

- The PILOs are appropriate for the subject matter and degree type. They have been mapped to the programme aims, to the NQF Descriptor Level 8, as well as the graduate characteristics provided in the Association for Computing Machinery (ACM)/ Institute of Electrical and Electronics Engineering (IEEE) Computer Science Curriculum Guidelines. Furthermore, informal benchmarking of the PILOs with a Public University in the kingdom Bahrain was completed. The Panel appreciates the significant internal and external mapping efforts that have taken place with regards to PILOs.

- However, although most of the PILOs follow Bloom's taxonomy, several of them lack clarity. The phrase 'use specialist level skills' appears several times without adding value to the outcome. For instance, D1 becomes unmeasurable as the 'special skills' for communication are not clearly defined. Furthermore, each PILO addresses several aspects, making them very difficult to measure. For instance, D2 addresses (1) ethical, legal, societal responsibility, (2) leadership, (3) group work, and (4) lifelong learning. Such a multi-barrelled outcome cannot be measured, as the outcome D2 can e.g., be met through leadership, groupwork and lifelong learning, without ensuring ethical behaviour. The Panel therefore recommends a comprehensive revision of the PILOs to ensure concise and measurable outcomes that can serve programme improvement.

- Similar to programme aims, course aims need further enhancements. For instance, the first course aim of CSC 421 is phrased as a course outcome rather than a course aim. In the same manner as PILOs often address numerous aspects, CILOs also combine different skills. For instance, course outcome b1 of CEC 421 addresses two different aspects (i.e., project management and software review/testing). The Panel therefore recommends a comprehensive revision of the CILOs to ensure concise and measurable outcomes that can serve course improvement.

- Although not contained in the course specification, the programme specification of the BCS programme contains an appropriate mapping of all CILOs to relevant PILOs. The Panel recommends that the course specification template be updated to include the mapping of the course's CILOs to the relevant PILOs. All course specification should be revised accordingly.

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.

Judgment: Addressed

- The programme specification clearly outlines the requirements of the programme, allocates courses to semesters, defines prerequisites and maps each course to the NQF Credit and NQF Level. Each semester requires students to take 5-6 courses, each one with three credits. This is a typical workload for Bachelor students. The Panel is satisfied that the pre-requisite structure of the programme is designed in such a way that the critical path does not include courses from each semester, allowing students to still progress should they fail a course.

- The HEI has policies that describe and support formal and informal benchmarking. This includes the benchmarking with other institutions and international professional bodies (e.g., the British Computer Society and ACM/IEEE. The Panel notices the significant efforts that the HEI invested in informal benchmarking exercises.

- The HEI relies mainly on informal, web-based or document-based benchmarking exercises. During the interviews, the Panel was informed that, currently, ASU has two formal benchmarking agreements with other institutions, both of which are based in Jordan. The formal agreements with Amman Ahliyya University and Philadelphia University have resulted in course-by-course benchmarking.

- Several extensive informal benchmarking exercises have been carried out. The Panel suggests that ASU could further improve its benchmarking by establishing additional formal benchmarking agreements with local or regional and international institutions, and to cover additional details (such as resources available to the programme, progression rates).

- Although no formal mechanism is documented in important policy such as LTA Strategy policy to ensure that an appropriate number of practical hours are included in the curriculum (see Recommendation in Indicator 1.4), external requirements (e.g., first review by the DHR and the NQF application, as well as requests from external

stakeholders) resulted in an increase of the practical hours. The Panel considers the current number of practical hours to be appropriate for the degree.

- Courses and textbooks are current and up-to-date. In interviews with external moderators, it was confirmed that they have been consulted on course content and that their feedback has been considered. They even stated that they had adopted some of ASU's courses at their own institutions. The relevance of textbooks is checked on a regular basis.

- Students and academics confirmed that recent research is being included in courses. One alumna even had the chance to publish the work of her graduation project. In addition, the increased focus on practical aspects ensures that current professional practice is being made part of the curriculum.

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.

Judgment: Partially Addressed

- ASU's framework for teaching and learning is contained in its LTA Strategy. This strategy document is linked to the institution's Strategic Plan to ensure that the education offered to students is in line with the institution's overall strategy.

- The LTA Strategy is a detailed document that comprehensively addresses teaching. The Panel noted that the LTA not only focuses on the teacher and teaching methods but also on the learner. This is an important, positive aspect of the LTA Strategy.

- The Panel noticed that despite the institution's desire to include more practical aspects in courses, this requirement is missing from the LTA Strategy. For instance, there is no mention of laboratories in the strategy document. In interview sessions, it was confirmed that neither the LTA Strategy nor other documents refer to what kind of courses should have practical components. Furthermore, it is noticeable that 'learner participation' is only mentioned once, while student independence, independent learning or self-learning are not mentioned. This also can be seen in the SER (Table 9), which only includes projects as a tool that encourages independent learning. The Panel recommends that the HEI formalize the inclusion of practical content in courses by adding this requirement to the LTA Strategy.

- The SER lists CSC 241 – Scientific Research Methods as a course in which students are required to study independently. However, upon examination of the course specification of CSC 241, the teaching methods listed do not refer to self-study, only to discussion. The same is the case for the LTA Strategy. It is therefore unclear to which extent the programme requires independent study of students. The Panel recommends that the

Institution formally includes in its related policies the requirement to incorporate independent self-study in the offered courses.

- The programme specification lists the teaching and learning methods used within the programme. It contains the typical elements, such as lectures, demonstrations, provision of examples, computer laboratories, etc. During the interview session, students stated that homework and reports in various courses encourage them to study on their own. The Panel is of the view that the current range of teaching methods applied in the programme is adequate for enabling students to achieve the PILOs.

- The LTA Strategy developed in 2016, states, that the use of Moodle is a priority area. Since then, there is a clear increase in e-learning and the use of Moodle has increased to 100%. However, it was confirmed during the interviews that the usage of Moodle seems to mainly focus on the distribution of lecture materials and submission of assignments and reports.

- The Panel learned in interviews that training workshops are being offered in order to encourage the usage of Moodle. This confirms statements contained in the SER regarding the training provided during induction of academic staff. However, the Panel noticed that the schedule of the induction indicates a limited amount of time being dedicated to online teaching. The Institution could benefit from training academics on the use of advanced features of Moodle (such as Moodle Analytics).

- Research capabilities of students are strengthened through writing reports for various courses, such as the Scientific Research Methods Course and the Graduation Project. Some extracurricular activities allow interested students to further enhance their research skills by participating in the annual Student Research Conference, programming competitions and other research workshops. One Graduation Project resulted in a student publication at an international conference. The Panel is of the view that while these extracurricular activities are excellent opportunities, they mainly benefit only a small group of students. The HEI could benefit from providing more mandatory research opportunities throughout the curriculum.

- The Student Affairs Office organizes extra-curricular activities for students. These activities encourage students to learn outside the classroom and to participate in community-related events or academic events (e.g., research presentations). However, it appears that most of the lifelong learning happens in the context of non-formal and informal learning and does not ensure the participation of all graduates of the BCS programme in such events. The Panel recommends that the Institution further enhances the opportunities offered to students for life-long learning.

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.

Judgment: Addressed

- The Assessment, Moderation and Feedback Policy provides clear details and instructions on assessments. It addresses assessment design, approval of assessment results, appeals, security of assessments, as well as pre- and post-moderation. Marking criteria as well as forms and reports for internal and external moderators are provided in this policy.

- Related policies and procedures are mainly disseminated through the Student Handbook and SharePoint, as well as at induction sessions. In meetings with various stakeholders, the Panel was able to confirm the widespread awareness of policies and their contents.

- According to the Assessment, Moderation and Feedback Policy, details of an early formative piece of work must be included in the Programme Specification. However, upon reviewing the BCS Programme Specification, it was not there. Yet, evidence for formative assessment was provided and students as well as alumni confirmed that both, formative and summative assessments take place, often in the form of exercises.

- The HEI has overall marking criteria that promote consistency in grading. Students confirmed that they receive timely feedback on their assignments.

- The HEI's efforts regarding maintaining ethics and high principles of scientific research are mainly limited to plagiarism detection. With the exception of the course CSC142 Computer Ethics and Social Responsibility taken by students in the first year, and one week in CSC 241 Scientific Research Methods, no further focus on ethics takes place. The Panel was unable to find evidence of a systematic process that ensures that ethical approval for research projects is received. The Panel recommends ASU to introduce a systematic process that requires that all research projects by students and staff go through a formal ethics approval process.

- Interviews with external moderators reassured the Panel that the HEI takes moderation very seriously. Internal pre-moderation takes place for all examinations, while external moderation is employed for final examinations

- During interviews, external moderators praised the online system that ASU developed to facilitate external moderation. Examination papers are uploaded, and moderators provide their feedback online after evaluating the examinations against a set of criteria The College Disciplinary Committee investigates cases of alleged academic misconduct. Students have the right to appeal the decision of the committee to the University Council. During interviews, it was confirmed that no case of academic misconduct was reported in the last

three years. The reason given was that due to the small student numbers, students can be coached well, and plagiarism be prevented. The Panel learned in interviews that both academics and students are aware that a percentage value provided by TurnItIn is insufficient to determine plagiarism and that a careful analysis of similarity checks has to take place.

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.

Judgment: Partially Addressed

- Admission requirements are fit for purpose. They are consistently specified and published in several documents as well as on the University website. These requirements have been benchmarked with other institutions in the country.

- Exceptions to the admission requirements are possible, but they do not appear to be well regulated. For instance, the bachelor's degree Bylaws Article (5) Item B.3 allow for admission of any student if approved by the University Council. The SER states that this option is provided to increase diversity and access to the programme. However, this has the potential of admitting applicants without adequate background. No guidance is provided as to what kind of exceptions are acceptable. Although the Panel learned that this exception has not been applied in the last few years, the Panel recommends that the HEI develop clear guidelines that describe suitable exceptions to the admission requirements.

- Both, male and female applicants are admitted. The Panel noticed that although only about one third of the admitted students are female, there are slightly more female than male student graduates.

- The HEI does not have a foundation programme. Instead, remedial courses are offered in English and Math. Over the last three years, the number of students required to take remedial courses has continuously dropped, while the progression rate of students who took remedial courses has increased.

- A Credit Transfer Policy exists and, together with the ASU Bylaws, regulates internal as well as external transfer. During the interviews, the Panel was informed that only transfer

of credit from accredited universities, colleges or other higher education institutions that are recognized by the Higher Education Council in Bahrain are allowed. This is in line with the Credit Transfer Policy. Evidence was provided that transfers of credits by students have taken place. Other forms of prior learning are not accepted.

- Like all other policies, the Admissions Policy is reviewed at least once every four years. The evidence shows that adjustments have been made more frequently as the need occurred.

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.

Judgment: Addressed

- The HEI has several policies that are related to recruitment, induction, appraisal and promotion. They spell out criteria for recruitment and settlement, retention, performance evaluation and leaves/attendance/overtime. The promotion criteria address not only teaching and research, but also behavioural aspects, administration and community engagement. This indicates areas considered important by the Institution, which values involvement with the community and a collegial work environment. However, the promotion policy appears to be mechanical in some places and the promotion requirements do not necessarily suit the domain of computer science. For instance, single-authored publications are very rare in computer science and occasionally interpreted as an indicator of a low-quality paper. The Department is encouraged to interpret these requirements in light of the domain.

- The research aspects of the University are overseen by the Deanship of Research and Graduate Studies. The core task of this office is to develop a culture of research at ASU. To achieve this, the Deanship of Research and Graduate Studies developed an Annual Operational Plan with clear strategic objectives, with timeline, measurable KPIs and people responsible. While some of them are clearly achievable, some targets are unrealistic and may be detrimental to quality. For instance, the operational plan provided in the evidence submitted by the Institution was effective as of 15/3/2018. The target specified for publications was 100 journal publications by the end of 2018, which does not appear to be a realistic target. In order to encourage high quality research, the HEI would benefit from taking a more realistic approach.

- The academic workload is clearly laid out in the Workload Allocation Model. The teaching commitments depend on the rank and administrative duties, ranging from five courses for Assistant Professors and Lecturers, to three courses for Full Professors. Administrative

tasks result in a further reduction of course loads. While this workload allows for some research activities for Full Professors, Assistant Professors with an interest in research and promotion won't likely have enough time for quality research, especially given the lack of graduate students in computer science.

- Seven full-time academic staff teach in the BCS programme. They hold a rank from Lecturer to Full Professor, with teaching experiences ranging from five to 30 years. Female employees can receive maternity leave at full pay as well as a compassionate leave if their husband passes away.

- The Unit for Academic Staff Development produces a staff development plan every year. After the completion of annual appraisals, the Staff Development Unit receives a list of training needs for academics. The Panel learned in interviews that nearly 100% of the needs can be covered. The Institution has a commendable focus on teaching improvement. The annual Good Teaching Conference is one core element. The second element is the Higher Education Academy (HEA) Fellowship Scheme. The Panel appreciates the commitment of ASU to train its academics through the HEA Fellowship Scheme.

- A Staff Satisfaction Survey is the main tool used to proactively reduce staff turnover. The survey has resulted in tangible improvements in several, different areas (e.g., benefits, environmental aspects, etc.).

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.

Judgment: Addressed

- In the virtual site visit tour video, the Panel found evidence of an adequate number of classrooms available for the BCS programme. Given the small number of students in each cohort, standard size classrooms, laboratories and computing facilities are sufficient. Specialized software (e.g., Cisco Packet Tracer, Logisim, OPNET) and hardware (e.g., switches, routers, firewalls) are available for networking and digital logic laboratories.

- Students and staff confirmed that IT facilities meet their needs. Although no default replacement cycle for IT equipment is defined, annual maintenance is performed during which emphasis is placed on adequacy of computing power for the laboratory experiments that will be carried out in the upcoming academic year.

- The library is of standard size with electronic databases being available. In particular, the library provides access to the IEEE/ACM Digital Library, which is an important means that helps academics and students with their research.

- The HEI maintains a list of all equipment and their locations. The ICT and Knowledge Management (KM) Directorate maintains the IT equipment and software licensing. Requests for maintenance can be submitted through an online portal.

- ASU has a Health and Safety Policy in place that specifies key responsibilities, risk assessment as well as communication. Fire drills are carried out regularly, and there is a clinic staffed by a full-time nurse as well as an outsourced campus security.

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.

Judgment: Addressed

- During the virtual site visit, the Panel learned that the Management Information System was custom-built and is based on Oracle. It contains all student information, both personal and academic. Study plans, courses completed, as well as their grades are stored in the system. Textual notes can be added to keep a record of any advising activities.

- During the virtual visit, the Panel learned that the usage of laboratories is recorded through attendance sheets for laboratory classes. Aside of attendance of classes, no recording of laboratory usage takes place. The usage of the library is tracked; however, the tracking of library and laboratory usage could provide more useful input into the facility-improvement process.

- Although information on the usage of Moodle was provided, academics did not seem to be aware of some of the advanced features that Moodle Analytics provides (e.g., tracking of student activities). Academics could improve their teaching effectiveness by reviewing students' activities within Moodle.

- Student records are protected through usernames and passwords. Different privileges are provided to people depending on their role. In interviews the Panel was reassured that data is entered at the time of admissions and verified through a multi-step process. At the time of graduation, students' data is subjected to further review.

- An extensive approval process is followed before a degree certificate is issued. This process ensures that only graduates meeting all degree requirements receive an award.

- During the virtual visit, the Panel learned that confidence in the Student Information system (SIS) has limitations. For instance, Cumulative Grade Point Average (CGPAs) continue to be manually verified. If the number of graduates increases, this might no

longer be possible. The panel advices the HEI to revise their processes after systematic testing of the SIS.

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.

Judgment: Addressed

- The HEI has a total of five IT specialists that support the entire campus. This includes staff and students. One of them is dedicated for the implementation and maintenance of Moodle. In addition, the library has a total of six staff members.

- A basic introduction to the various systems and facilities is provided during the induction of new students. In interviews, the Panel learned that based on the request of students, a video was produced to explain the use of the e-library.

- In interviews, the Panel learned that one student counsellor is available to help students with social and psychological challenges. In addition, students have academic advisors to help them improve their academic performance.

- Career guidance is provided by the Deanship of Student Affairs. Workshops are offered as well as an annual Job Fair. Meetings between current students and alumni help link students with the industry.

- The HEI has brief guidelines on induction for new students. Induction sessions are compulsory for new students and cover a variety of academic and non-academic aspects.

- The HEI has an advising policy. This policy requires that each student have an academic advisor whom they will meet during the initial orientation. The advisor plays a key role in guiding the student through their programme and assisting them with the decisions they have to make. The policy describes the key responsibilities of academic advisors. It also specifies the content of a student file.

- It is the responsibility of the academic advisor to help students at risk of academic failure to improve their performance. An Academic Action Plan is developed in coordination with the student. It plays an important role in helping the student perform better.

- There is a central Advising and Direction Unit within Admissions & Registration. If students face challenges of a personal nature, they are advised to visit the Deanship of Student Affairs.

- Although the BCS programme has a majority of male students, members of the student clubs are mostly females. One of these clubs is a dedicated Women's Club.

- In interviews, the Panel learned that special effort is made to accommodate students with special needs. At the time of admission, students are asked to self-report any special needs they have. The Panel learned in interviews that currently there are around 20 students who registered various special needs. All buildings are wheelchair accessible and equipment is provided for students Who are visually impaired.

- Academically weak students are classified as 'at risk' (CGPA of 60-62%) or on probation (CGPA < 60%) depending on their CGPA. Students who, at the end of the semester, fall into one of these two categories are automatically warned by the SIS and contacted by e-mail. A personal conversation takes place between the student and their advisor in order to determine the best way forward. This meeting is documented in a report.

- Assessment of the quality of student support services takes place through a set of six student surveys. The two key surveys are the Student Satisfaction Survey and the Exit Survey of Graduating Students. The Measurement and Evaluation Unit conducts the surveys and analyses the results, while the department that was surveyed has the task of addressing weaknesses and implementing improvements.

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.

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.

Judgment: Partially Addressed

- Current assessment methods are consistent with the ASU Assessment, Moderation, and Feedback Policy. The policy clarifies the purpose of assessment and feedback and is linked to other policies, such as the University's External Examiners Policy. The Benchmarking Policy, which was updated in 2019, includes procedures for benchmarking. It was developed to meet the international standards of various assessment methods in line with ACM/IEEE reference curricula. The Panel observed that a recent programme benchmarking was conducted with local and regional universities. The purpose of the benchmarking was to obtain further insight into the BCS programme compared with other regional Computer Science programmes.

- The BCS programme specification contains a mapping of CILOs to PILOs. The course assessments are mapped to the CILOs as per the course specifications and the CILOs were mapped to the PILOs. In addition, the PILOs are mapped to the ASU graduate attributes. The Panel notes that the College practices regular reporting and documenting of feedback related to the course assessments to the concerned quality department. This is shown in minutes of various meetings of the College Curriculum Committee and the College Quality Assurance and Accreditation Unit (CQAAU).

- There are several mechanisms in place to ensure that graduates achieve the skills described in the PILOs and also achieve the programme aims. An annual programme review report that was conducted in 2019 shows the mechanisms used to measure outcomes' achievement and provide feedback for improvement. The level of students' achievements of the programme aims is measured directly and indirectly. There was evidence for direct measurement of PILOs which are continually measured in relation to the CILOs and as well as reports of survey results from Employers and Alumni as indirect measures. The SER also shows mechanisms that are in place to ensure that graduates achieve the programme outcomes, such as advisory board feedback, alumni surveys as

well as internal and external moderators who gives enhancement suggestions and feedback.

- The assessment process of the programme follows the University Policy for Assessment, Moderation and Feedback. Through the moderation of course assessments, feedback is provided to the course instructors for improvement. The Quality Assurance and Accreditation Centre (QAAC) schedules course and programme portfolio reviews for quality assurance purposes. The SER describes the PILOs achievement system applied at the programme level. The evidence presented includes examples of improvement of assessments after the implementation of the moderation process.

- Given that the definition of PILOs and CILOs lacks clarity and precision (see Indicator 1.2), the effectiveness of their measurement is, hence, questionable. For instance, if a PILO addresses several aspects, it is unclear which one (or ones) are not achieved were this PILO ranked low. In addition to the revision recommended by the Panel in Indicator 1.2, the Panel also recommends the development of clear metrics that allow effective measurement of single-focused PILOs and CILOs.

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).

Judgment: Partially Addressed

- ASU and the College of Arts and Science have a common Code of Ethics and Professional Conduct Bylaw which is part of the Student Handbook and the Staff Handbook. There is also a Research Ethics Policy. The College disseminates such policies through awareness workshops for students and staff. The Panel notes that staff (including the newly-hired staff) are aware of these policies and procedures.

- The College has a disciplinary and appeals committee as explained in the supporting materials to decide on academic misconduct cases and their penalties. The committee ensures that the university's Academic Misconduct and Plagiarism Policy, and Examination Rules and Regulations are applied. The TurnItIn tool is embedded in the Moodle Learning Management System for conducting similarity checks of students' works as a proactive measurement for students. The Panel recommends to consistently apply plagiarism-detection tools such as TurnItIn to all assessments where appropriate and to utilize the Analytics plugin of TurnItIn.

- There is a University Academic Misconduct and Plagiarism Policy and Examination Rules and Regulations. The Panel learned that there had been no academic misconduct cases in

the last three years. This appears to be due to the fact that class sizes are very small, and faculty are able to carefully supervise students.

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.

Judgment: Addressed

- ASU has procedures for internal moderation of assessments following the ASU Assessment, Moderation, and Feedback Policy. The moderation process is conducted using the e-Exam Moderation Portal which has several levels of approvals. The selection of the internal moderator is led by the Head of Department (HoD) who is responsible for managing the BCS programme. The moderation process considers several criteria such as specialization, teaching experience and research focus of the moderator to be nominated and selected. The Panel notes that the e-Exam stakeholders are very pleased about the system in place which allows for a smooth implementation of the moderation process.

- The internal moderation process applied by the programme team consists of two stages: pre- and post- moderation of the course assessments. Their main purpose is to improve the assessment quality of courses in order to improve the academic programme. The Panel noted from the interviews and the illustration in the SER that the internal and external moderators are well- versed in the moderation procedures. The evidence presented confirms that internal moderation has been taken into consideration for improvement purposes.

- There is a clear internal moderation process at the programme level and headed by the HoD. The results of this process are communicated to the Dean and QAAC every semester. The QAAC and the CQAAU are intended for checking the quality of the internal moderation process at the college and university level. The evidence provides samples of minutes which contain recommendations to be considered for internal moderation and an audit report from the CQAAU.

- In addition, ASU has formal procedures for external examiners. The external moderation process is also managed through the e-Exam Moderation Portal with proper approving matrix. The evidence indicates that the selection of the external examiners is subject to change every three years. The Panel learned from external moderators that they are very pleased to use the online e-Exam Moderation Portal for the moderation process.

- The BCS programme and courses are regularly reviewed by external moderators and examiners. Some report samples are shown in the provided evidence. The feedback of the moderators and examiners is one of the sources of input for the improvement of course

assessments and the programme outcomes. The extra evidence submitted by the College provides sufficient proof of this process.

- Feedback from external moderators and examiners are reviewed by the College Academic Standards and Examiners Committee to close the loop for the improvement process. As shown in meeting minutes, the College has acted based upon recommendations and the committee approved and suggested changes to upper level courses to improve the programme. The Panel notes that there is collaboration between the College and the QAAC to synchronize such changes.

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.

Judgment: Addressed

- There is a clear policy for student internship at the university level. This policy specifies the process from identifying internship organizations, commencement of the internship programme, up to the evaluation and feedback. The evidence shows the internship assessment and evaluation forms required from the interns. The Panel observed that the procedures are well known by the interviewed students.

- The roles of the internship stakeholders, including providers, supervisors and site supervisors, are explained in the Student Internship Policy. These responsibilities are clear for all stakeholders involved in the internship. The Panel notes that staff and students are well informed about these procedures and responsibilities. Nevertheless, the Panel recommends that the institution further improve the Student Internship Policy by clearly specifying responsibilities for Health and Safety of students while on internship.

- The internship is a mandatory course before graduation and contributes to a major part of the programme's goals. The internship course specification contains mapping of the course assessment methods to the course outcomes, which are linked to PILOs. The Panel notes some inconsistencies in the information about the CILOs' mapping to the PILOs in the SER and in the internship course specification. The internship assessment is mapped to six CILOs in the SER, however, it is mapped to only five CILOs in the course specification. The Panel urges the College to revise the internship course specification and update it accordingly.

- The internship assessment is managed as shown in supporting evidences. It consists of five elements, which are Organization Supervisor's Evaluation Form, the Activity Report, the Attendance Report, the Final Report, and the Final Presentation. These assessment

methods are appropriate for a course at the senior level. The Panel notes positive feedback from the internship site supervisors who were interviewed during the virtual site visit.

- Quality assurance audits based on the Quality Assurance Manual are used to evaluate the effectiveness of various processes. The College also applies this manual to the internship course. The Panel was provided with an academic audit report for the internship, which contains recommendations for improvement. The evidence also includes a sample survey of the internship feedback provided by one employer with positive feedback and recommendations. This is another input for internship improvement from external stakeholders that the programme takes into consideration.

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.

Judgment: Addressed

- The Graduation Projects 1 and 2 are mandatory courses of the BCS programme. The Graduation Project courses aim to develop student skills in software system development and research. Both courses are linked to all eight PILOs.

- The Graduation Project Handbook does not define the roles and responsibilities of the supervisors and students as stated in the SER. The SER presented the responsibilities and the role in a more organized manner than the Graduation Project Handbook. The Panel recommends that the Institution updates the Graduation Project Handbook and includes the supervisor and student responsibilities.

- There are several mechanisms for monitoring the progress of the graduation project, such as weekly meeting logs, the graduation project midterm review form, and the graduation project supervisor report. The graduation project lifecycle, including regular monitoring and feedback is well-maintained and documented throughout the supervision period.

- The planning, time management, commitment, reporting, implementation, and communication skills of students are evaluated and assessed within their graduation project. An external examiner is part of the assessment process for the graduation project. Like other courses, internal and external moderation processes are applied on the project. During the virtual interviews, the Panel noted that the capstone monitoring mechanism used is clearly understood by the staff members.

- The College has several mechanisms for monitoring the implementation of the graduation project, including course evaluation and feedback. The external examiner report serves as an additional source of feedback for the internal moderation to improve the quality of the graduation project.

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.

Judgment: *Partially Addressed*

- The levels of student achievements of the programme outcomes are mapped to NQF levels 5–8. All course assessments and outcomes, including the course level, are mapped to the programme outcomes. In the last annual programme review report, the programme performed well in terms of student achievements. The Panel notices that there are some examples that show that the programme encourages the students to innovate such as recently accepted research paper submitted by one of the students to a Scopus indexed conference. Moreover, the Department starts to offer a cutting-edge course in Data Science as per the recommendation of the advisory board. Overall, the level of student achievement is satisfactory based on the sample of examined examinations, assignments and capstone projects. However, as noted in the interview with external moderators the level of examinations should be more challenging. The Panel is also of the view that most of the capstone projects submitted were web-based systems. Such projects tend to be done as part of a Computer Science course, not necessarily for the capstone project. Hence, the Panel recommends that the programme should review and enhance the level of complexities of examinations and projects.

- The Panel noted the positive feedback from employers interviewed. The graduates of the programme are well-received and welcomed by the local employers. The Panel learned in interviews that some students chose to pursue further studies and were able to continue their education without difficulties. Some students were accepted for graduate studies overseas.

- The student progression rate in the last three years is constant as shown in the annual programme review report. The percentage of BCS programme students who successfully graduate is in line with other programmes in the College.

- The graduate employment rate is above 80%. This indicates that the programme is well-received in the community.

- ASU conducts employer and alumni surveys. In addition, the field supervisors of the internship (who are potential employers of CS graduates) also evaluate students. All these surveys show above average satisfaction rate for the programme operation and graduates.

Standard 4

Effectiveness of Quality Management and Assurance Academic Standards of Students and Graduates

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

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.

Judgment: ***Addressed***

- Appropriate institutional policies are stated clearly in the ASU Quality Assurance Manual which is available for all staff to learn about the quality management system within ASU. The Panel appreciates the thoroughness of the Quality Assurance Manual and the level of detail provided in it.

- The SER states that policies and regulations are revised every two years. The Panel notes that updates of policies or regulations are well-communicated to all stakeholders through different communication channels, such as the website, workshops, induction and orientation days. Further, the SER states that the President's weekly News Digest is an extra channel used to provide summaries of key policies.

- The SER states that the quality assurance system is managed at different levels within the ASU. At the university level there is the ASU Quality Assurance and Accreditation Council, then the ASU QAAC, which has the operational and strategic responsibility for all quality assurance activities. At the college level, there is the CQAAU, which has the responsibility for coordinating and monitoring the quality assurance practices and processes in relation to teaching, learning, assessment and programme development. The SER and the ASU Quality Assurance Manual clearly describe the quality assurance management system at the programme level and course level. In addition to the Programme Leader at the programme level, there is a programme team. At the course level, there are Course Coordinators who report directly to the Programme Leader.

- The CQAAU is responsible for operationalizing quality assurance at the college level within the framework of the university's quality management system. Also, the SER states that the unit ensures that the College consistently enhances quality of learning and teaching as a core function. In addition, the quality assurance unit is responsible for working with the other colleges to ensure that the outcomes of annual and periodic

reviews are implemented. The QAAC produces an annual Quality Assurance & Accreditation Report which compiles outcomes, key themes and actions required.

- The Panel noted in interviews that academics and support staff have a good understanding of ASU's quality assurance system and their role in ensuring effectiveness of provision. Also, the College ensures that its staff members are briefed on and understand their role in assuring quality across all parts of the University through the induction day. Furthermore, during the interview sessions, staff confirmed that they attended a number of workshops on quality assurance, the Quality Assurance Manual, Course Portfolio Management, Annual Programme Review and Benchmarking, NQF, moderation and other activities as stated in the SER and supporting evidence.

- The ASU quality assurance management system is monitored by the CQAAU to ensure the implementation of the processes that it requires, such as: review and audit, surveys data analysis, and external quality assurance mechanisms. Also, the effectiveness of such processes is evaluated by the QAAC and the Quality Assurance and Accreditation Council, which meet regularly to ensure appropriate oversight the processes. Furthermore, the SER states that the ASU quality assurance management system is evaluated and improved from the perspective of the impact it has on students through the student representatives in both the College Council and the Department Council. The evidence provided to the Panel includes examples of some enhancements such as: Introducing the Staff Satisfaction Survey with QAAC Services, enhancing academic procedures during the process of achieving the International Standard of Management Systems for Educational Organizations ISO 21001:2018 certification for the University's academic provision, and the External moderator evaluation.

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.

Judgment: ***Addressed***

- The SER presents the college organizational chart. This chart describes both the administrative and academic functions. The Panel confirms that such organizational structure is appropriate for the college size and demonstrates effective leadership with clear lines of accountability.

- The SER explains the six key stakeholders: Dean, Vice Dean, HoD, Programme Leader, Course Coordinator and Academic Staff. The Quality Assurance Manual describes their main job roles and academic responsibilities, which rest on three different levels (Department, College and Institution). The Panel is satisfied that the leadership responsibilities are distributed fairly among the ASU staff and faculty members with a clear reporting lines to ensure reliable and robust academic and functional management.

- Reporting lines reflect a clear and effective communication and decision-making process. This was confirmed by the provided evidence, which shows an example of an important decision that was first discussed at the Department Council meeting, then was forwarded to the College Council, which in turn forwarded it to the University Council for final approval.

- ASU established a comprehensive committee structure to provide appropriate communication and support of the decision-making process. Each committee at the department level reports to the relevant committee at the college level, which in turn reports to the university level committee. The University level committee reports to the University Council, which in turn reports to the Board of Trustees.

- The SER describes the programme management and shows that it demonstrates effective and responsible leadership. Also, during the Panel's virtual site visit, the BCS programme team confirmed that they are responsible for the academic quality of the programme and that they, meet regularly and report directly to the HoD.

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.

Judgment: ***Addressed***

- ASU has an appropriate annual internal programme evaluation, which results in a comprehensive report that includes recommendations for improvement on both programme and course levels. At the programme level, the programme team conducts an annual review through the production of Annual Programme Review Reports (APRRs) by the Programme Leader. At the course level, class observations and evaluations are conducted, which result in a Course Evaluation Report (CER) written by the course coordinator at the end of every semester. Further, during the annual programme review procedure, the Programme Leader analyses data on student performance.

- The SER as well as the provided evidence show that ASU has a clear mechanism for monitoring the implementation of the annual evaluation recommendations for improvement at the programme and course levels.

- ASU's Monitoring and Review of Programmes Policy is a comprehensive policy for the periodic review of the programme. It provides a mechanism to ensure annual and periodic review of its programme.

- The implemented periodic reviews are comprehensive and include feedback from internal and external stakeholders. The University's procedures for annual and periodic reviews

require input from external examiners. At the end of each year, the programme's external examiner provides a report, which evaluates all aspects of the programme, including the outcomes of student assessments and the fairness and consistency of the grading.

- To ensure that there is student input into these processes, ASU conducts several student surveys: a New Student Experience Questionnaire, a Student Course Evaluation Survey, a Graduation Project Course Evaluation Survey, an annual Student Satisfaction Survey, an Exit Survey for Graduating Students and an Alumni Satisfaction Survey. Furthermore, the programme leader documents any strengths or weaknesses of the programme through the documentation of the Programme Reflective Analysis Report.

- ASU has a mechanism to ensure the implementation of the periodic reviews and related improvement plans according to the Monitoring and Review of Programmes Policy. Although, there is no periodic review event yet for the programme as the new study plan has not yet finished the full life cycle, the programme periodic review will take place in the end of 2020/2021. The Periodic Programme Review Report template includes points of satisfaction with the programme as well as suggested points for improvement for both the programme as a whole and at the course levels.

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.

Judgment: ***Addressed***

- ASU conducted a number of different benchmarking exercises and utilized a number of internal and external reference points to verify the comparability of the institution's academic standards with other similar programmes in Bahrain, regionally and internationally. ASU has a benchmarking policy, which describes annual benchmarking internally and externally, formal and informal. ASU provided the formal MOU with Philadelphia University in Jordan.

- ASU utilizes the benchmarking outcomes to inform the decision-making process. The SER includes several examples of previously carried out formal and informal benchmarking activities which resulted in a revision of the programme study plan and curriculum enhancements.

- ASU has a formal mechanism for collecting structured comments from internal and external stakeholders (surveys and focus groups). Also, ASU established a Measurement & Evaluation Unit (MEU) responsible for gathering feedback from stakeholders (faculty, students, alumni, and employers of graduates) through periodic focus group discussions and surveys.

- Collected comments are analyzed and used to inform decisions about the programme. The SER shows how the different data are gathered from different stakeholders and analyzed to be incorporated into action plans.

- ASU has mechanisms to implement improvements and to communicate the outcomes to stakeholders. The Programme Review and Monitoring Policy clearly outlines these mechanisms through the documentation of the Annual Programme Review Report and Periodic Programme Review Report.

- The Panel noted during the virtual site visit that both the external stakeholders and students were satisfied with changes implemented based on their feedback. Also, the SER and the evidence provided confirmed that results of students, employers, external examiners and alumni satisfaction surveys were analyzed and considered.

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.

Judgment: ***Addressed***

- The BCS programme has an advisory board with discipline experts, employers and alumni working in both public and private sector. During the interview, the Panel confirms that the advisory board has a clear term of reference (ToR).

- The BCS programme advisory board meets at least once every semester and the outcomes of these meetings are used to amend the study plan of the programme or to make recommendations to the ASU Board. Also, the Panel noted that comments are recorded in the APRR and an action plan is developed to implement them.

- ASU has mechanisms to ensure that the programme meets the needs of the national labour market and society. The SER shows the eight tools that the BCS programme uses to obtain information about its relevance to the market needs and to the national and societal needs. Also, there are annual surveys to determine the market needs.

- ASU conducts formal studies to ensure that the programme is relevant and up-to-date. The BCS programme also relies on published formal studies, the HEC Industry, and the Employer Graduate Skills Requirements Report, alongside the last Market Gap Study conducted by Tamkeen in 2010. All the aforementioned studies used to highlight the employment trends and employer requirements in terms of skills, and employment occupation descriptions in key sectors in Bahrain, especially the ICT sector. In a similar fashion, the advisory board's external members who are computer science specialists confirmed the labour market needs identified by the reports are currently still in demand.

- The SER provides evidence that ASU's mechanisms are monitored and reviewed by providing samples of surveys before and after revision. Mechanisms which are used to ensure that the programme meets the labour market, national and societal needs, are monitored and reviewed at different levels, such as the MEU, assisted by the ICT & KM Directorate. In ASU, different surveys are administered by the MEU throughout the academic year. The BCS programme made efforts to include input from a broad range of internal and external stakeholders, such as students and alumni surveys, advisory board and employers in the process of preparing the APRR.

V. Conclusion

Taking into account the institution's own self-evaluation report, the evidence gathered from the interviews and documentation made available during the 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 Computer Science of College of Arts and Science offered by the Applied Science University.

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

1. The significant internal and external mapping efforts that have taken place in regard to Programme Intended Learning Outcomes.
2. The commitment of Applied Science University to train its academics through the Higher Education Academy Fellowship Scheme.
3. The thoroughness of the Quality Assurance Manual and the level of detail provided in it.

In terms of improvement, the Panel recommends that the Institution should:

1. Shorten the programme aims by removing some of the details to better differentiate them from the Programme Intended Learning Outcomes.
2. Improve the alignment between the regionally focused programme aims and the globally focused university mission.
3. Conduct a comprehensive revision of the programme intended learning outcomes to ensure concise and measurable outcomes that can serve programme improvement.
4. Conduct a comprehensive revision of the course intended learning outcomes to ensure concise and measurable outcomes that can serve course improvement.
5. Update the course specification template be to include the mapping of the course's Course Intended Learning Outcomes to the relevant Programme Intended Learning Outcomes. All course specification should be revised accordingly.
6. Formalize the inclusion of practical content in courses by adding this requirement to the Learning, Teaching and Assessment Strategy.
7. Include formally the requirement to incorporate independent self-study in the offered courses in related policies.
8. Enhance the opportunities offered to students for life-long learning.

9. Introduce a systematic process that requires that all research projects by students and staff go through a formal ethics approval process.
10. Develop clear guidelines that describe suitable exceptions to the admission requirements.
11. Develop clear metrics that allows effective measurement of single-focused Programme Intended Learning Outcomes and Course Intended Learning Outcomes.
12. Apply plagiarism detection tools consistently such as TurnItIn to all assessments where appropriate and to utilize the Analytics plugin of TurnItIn.
13. Improve the Student Internship Policy by clearly specifying responsibilities for Health and Safety for students while on internship.
14. Update the Graduation Project Handbook and include the supervisor and student responsibilities.
15. Review and enhance the level of complexities of examinations and projects.