Directorate of Higher Education Reviews

Programme Review Report

University of Bahrain
College of Information Technology
Master of Science in Information Technology
Kingdom of Bahrain

Site Visit Date: 7-9 December 2020

Extension Visit Date: 14 February 2022

HA039-C3-R039

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Acronyms

ACM	Association for Computing Machinery
APR	Academic Programme Review
BQA	Education & Training Quality Authority
CAC	College Accreditation Committee
CGPA	Cumulative Grade Point Average
CILO	Course Intended Learning Outcome
CIT	College of Information Technology
CSB	Civil Service Bureau
DAC	Department Accreditation Committee
DGSSR	Deanship of Graduate Studies and Scientific Research
DHR	Directorate of Higher Education Reviews
HEC	Higher Education Council
HEI	Higher Education Institution
HoD	Head of Department
IEEE	Institute of Electrical & Electronic Engineering
ILO	Intended Learning Outcome
IT	Information Technology
KFUPM	King Fahd University of Petroleum and Minerals
MSc in IT	Master of Science in Information Technology
NQF	National Qualifications Framework
PD	Professional Development
PC	Personal Computer
PCAP	Postgraduate Certificate in Academic Practice
PEOs	Programme Educational Objectives
PIAC	Programme Industrial Advisory Committee
PILO	Programme Intended Learning Outcome
PSAC	Programme Student Advisory Committee
PSC	Postgraduate Studies Committee

QAAC	Quality Assurance & Accreditation Centre
QAAEC	Quality Assurance & Accreditation Executive Committee
QAC	Quality Assurance Committee
SER	Self-Evaluation Report
SIS	Student Information System
UILO	University Intended Learning Outcome
UoB	University of Bahrain

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 (Cycle 1) 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 form 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 satisfied, including Standard 1	Limited Confidence
One or no Standards satisfied	No Confidence
All cases where **Standard 1** is not satisfied	

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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 and the extension visit, in relation to the review standards, indicators and their underlying expectations.

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

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II. The Programme's Profile

Institution Name*	University of Bahrain (UoB)
College/ Department*	College of Information Technology Department of Computer Science
Programme/ Qualification Title*	Master of Science in Information Technology (MSc in IT)
Qualification Approval Number	981/2014 (28/4/2014)
NQF Level	-
Validity Period on NQF	-
Number of Units*	33 credit hours
NQF Credit	-
Programme Aims (Educational Objectives)*	• Acquire advanced cutting-edge knowledge and leadership skills necessary to advance their careers in IT. • Engage in exploration, innovation, research, and life-long learning in the field of IT. • Contribute positively to society through responsible, professional, and ethical IT practice and research.
Programme Intended Learning Outcomes*	• An ability to apply the knowledge of computing and IT appropriate to the discipline. • An ability to analyze challenging problems, and identify and define the computing requirements appropriate for their solutions that meet appropriate computing standards and realistic constraints. • An ability to effectively identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems. • An ability to design, implement, and evaluate a system, process, component, or programme to meet desired needs using best practices and standards, within realistic constraints such as economic, environmental, social, ethical, health and safety, etc. • An ability to function effectively in a team by assuming different roles and demonstrating effective leadership qualities and project management skills to accomplish a common goal towards a significant project.

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	- An ability to assess professional, ethical, legal, security and social issues and responsibilities. - An Ability to communicate effectively both verbally and in writing with a range of audiences. - An ability to engage in continuing professional development and life-long learning. - An ability to acquire, critically evaluate and apply a wide range of advanced and specialized techniques, skills and tools necessary for IT practice. - An ability to conduct research, individually and in a team.

*   Mandatory fields

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III. Judgment Summary

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The Programme's Judgement:
Confidence

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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	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	Partially Addressed
Standard 3	**Academic Standards of Students and Graduates**	**Satisfied**
Indicator 3.1	Efficiency of the Assessment	Addressed
Indicator 3.2	Academic Integrity	Partially Addressed
Indicator 3.3	Internal and External Moderation of Assessment	Partially Addressed
Indicator 3.4	Work-based Learning	Not Applicable
Indicator 3.5	Capstone Project or Thesis/Dissertation Component	Addressed
Indicator 3.6	Achievements of the Graduates	Addressed

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Standard 4	Effectiveness of Quality Management and Assurance	Satisfied
Indicator 4.1	Quality Assurance Management	Partially 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	Partially Addressed
Indicator 4.5	Relevance to Labour market and Societal Needs	Addressed

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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 Master of Science in Information Technology (MSc in IT) programme at the University of Bahrain (UoB) offered by the College of Information Technology (CIT) is one of the postgraduate programmes targeting Information Technology (IT) professionals and providing advanced topics in the field of IT. A review of the submitted evidence as well as the information reported during interviews confirmed to the Panel the programme's compliance with UoB's regulations and requirements for designing, developing, and offering academic programmes, as well as its compliance with international academic standards and practices, such as the Association for Computing Machinery (ACM) and the Institute of Electrical & Electronic Engineering (IEEE).

- The academic planning process usually involves the identification of potential risks and the implementation of measures to minimize them. The Self-Evaluation Report (SER) states that identification of risks in the programme is carried out through the work of several committees at different levels (e.g., Postgraduate Studies Committee (PSC) and the Quality Assurance Committee (QAC)) and through the development of the programme's annual evaluation report in which risks are pointed out. The Panel, however, did not find evidence of a specific plan according to which risks relevant to the quality of the programme, its delivery, and academic standards are identified and effectively addressed. The only type of risk management plan that was provided as evidence is that of UoB's IT Centre in relation to data backup. The Panel, therefore, recommends that the College should develop a plan for the identification and management of potential risks that could threaten the quality, delivery, and academic standards of the programme.

- Integrated in the academic planning process also are the steps taken to ensure adherence to the National Qualifications Framework's (NQF) requirements (e.g., NQF qualification design, Programme Educational Objectives (PEOs), and Programme Intended Learning Outcomes (PILOs) and their justification). Currently, the programme is under review by

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the NQF for a placement at NQF level nine. Materials submitted as evidence include a copy of the university approved NQF placement application, which includes information pertaining to mapping and confirmation processes, and mapping scorecards for all courses, which involve specifying the level of each course's Intended Learning Outcomes (ILOs) and assessment methods to the relevant NQF level descriptors, including rationales for those particular mappings.

- As clearly stated in the SER, the PEOs and the PILOs have been reviewed for continuous improvement and, in the panel's view, they generally indicate the programme's relevance and fitness for purpose and reflect the programme's/qualification's title, which the Panel considers to be concise, well-documented, and consistent with international naming practices worldwide. Interviews with senior management, faculty, and staff, along with the review of relevant documentation, further confirmed to the Panel the programme's fitness-for-purpose.

- The Panel notes that the PEOs were last revised by an ad-hoc committee consisting of members from the PSC, QAC, and the Office of the Dean. However, the Panel noticed the absence of entrepreneurship in the PEOs as well as in the PILOs, although entrepreneurship is an integral part of CIT's vision and strategic pillars. The Panel, therefore, recommends that the College should revise the PEOs and the PILOs to include entrepreneurship.

- The PEOs are generally aligned to the mission of the College and also to that of the University, as well as to the University Intended Learning Outcomes (UILOs). Whereas the PILOs are aligned to both the UILOs and the PEOs. All these alignments, according to the Panel, demonstrate how the programme contributes to the achievement of UoB's and CIT's missions and strategic goals. The Panel notes with appreciation the clear academic planning framework in place, outlining the main PEOs of the MSc in IT programme and how these objectives contribute to the achievement of UoB's mission and vision.

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*

- UoB's graduate attributes are identified through a set of UILOs. From interviews with senior management and faculty and review of the relevant documentation, the Panel finds that the PEOs of the programme are aligned to these UILOs. The result of this alignment is, afterwards, cascaded first, to the level of the programme through a set of PILOs and then, to the level of the courses through a set of Course Intended Learning Outcomes (CILOs). The Panel notes the linkage of the PILOs to the PEOs and the alignment of the different university, programme, and course outcomes together.

- The PILOs, ten in total, are clearly stated in the documentation that the Panel reviewed and are distributed over four categories and written in a measurable format. They are also, in principle, clearly aligned to the PEOs. However, the Panel notes that the PILOs and the CILOs have not been benchmarked despite the benchmarking exercise that the CIT conducted in 2020 against the study plans of 11 international universities. Moreover, the Panel considers the PILOs as somewhat high in number and is of the view that the level of a couple of them could be elevated to better match that of a master's programme at NQF level nine (e.g., '*An ability to apply the knowledge of computing and IT appropriate to the discipline*', and '*An Ability to communicate effectively both verbally and in writing with a range of audiences*'). The Panel, therefore, recommends that the College should benchmark all ILOs in the programme, to revise them in a manner that ensures a higher degree of their appropriateness for the type and level of the degree awarded and alignment with international norms.

- With respect to the CILOs, the Panel notes based on analysis of relevant documentation including NQF mapping scorecards that these are appropriate for the level of the courses and their contents. This was further confirmed to the Panel during interviews with faculty and with members of both the Programme Industrial Advisory Committee (PIAC) and the Programme Student Advisory Committee (PSAC). Satisfaction with the courses and their ILOs was also reflected in the results of the students' senior exit survey.

- The Panel notes that the CILOs are all mapped to the PILOs and are already mapped onto level nine of the NQF, and draws attention to the point that should the CIT proceed with revising the PILOs as recommended earlier, the current CILOs will be impacted by this revision.

- As for the learning outcomes required for the research components of the programme, these are embedded into all the courses forming the study plan of the programme, with a greater focus being placed in the course 'IT699-Thesis'. After review of the relevant documentation, the Panel notes that the thesis CILOs contribute to the achievement of the MSc in IT educational objectives and the PILOs.

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: *Partially Addressed*

- The study plan is included in the programme specifications document and is expected to be completed in two years, while consisting of 33 credit-hours, from which 21 credit-hours are core courses, six credit-hours are elective courses, and six credit-hours are for the thesis. As for NQF levels and credits, these are clearly indicated in the copy of the study plan submitted as part of the programme's NQF placement application. The Panel is of

the view that the study plan demonstrates appropriate year-on-year and course-by-course progression, with clear pre-requisite requirements and a suitable workload.

- The PSC of the CIT is responsible for reviewing the programme's study plan by checking existing guidelines like ACM and IEEE; benchmarking with other universities; and collecting feedback from faculty, the PIAC, the PSAC, and the students' exit survey. Due to all these review activities, several modifications have taken place in the current study plan, such as replacing the course 'IT511-TCP/IP Networking' with 'IT601-Computer Networks' and making 'IT605-Advanced Software Engineering' a core course, in addition to other changes which have resulted in the proposal of a newly revised 2020 version of the study plan. The Panel notes with appreciation the continuous review and update of the MSc in IT programme's study plan, which the Panel found through the review of evidence during the extension visit of the programme to have led to appropriate measures in terms of addressing some existing concerns in the current curriculum, such as depth and rigour of topics covered.

- The Panel finds, based on evidence and interviews, that the programme's study plan and the curriculum it incorporates are well-structured to ensure appropriate academic progression and balance between theory and research practice and between knowledge and skills. This is demonstrated through a diverse set of core and elective courses and ensured through different mappings between the University, programme, and course outcomes.

- The programme's curriculum, whether existing or under-approval, generally includes an appropriate mix of core and elective courses that should ensure a good coverage of various IT topics in terms of depth and breadth. To ensure that the curriculum is in-line with international standards, the CIT undertook a major benchmarking exercise by putting together a list of international universities offering MSc degrees in IT and their corresponding courses. While the Panel acknowledges this step and expresses satisfaction with the breadth requirement of the curriculum, the depth requirement was initially a concern for the Panel. This concern was mainly due to the description of some courses including topics that are normally discussed at the undergraduate level, thus lacking the same degree of depth and rigour of what is normally covered in graduate studies. However, after the virtual visit, the programme worked on such curricular issues, and during the extension visit, the Panel noted that all these concerns had been addressed through a thorough review that the programme undertook in 2021 of all course syllabi. What remains to be equally important, according to the Panel, is that these revisions be reflected in the delivery of the programme. The Panel, therefore, recommends that the College should ensure that all the 2021 revisions in the course syllabi be reflected in the delivery of the programme.

- With respect to textbooks and references, the Panel was concerned during the initial review of the programme about their quality and currency in some courses, especially since the SER claimed that the most recent textbooks and references were being used in the programme. However, the recent review of all course syllabi also included a major review of all textbooks and references in the MSc in IT programme. Post the extension

visit, the Panel is convinced that the textbooks are adequate and fit for the purpose of the programme.

- Working closely with the University Graduate Programmes Coordinator and the MSc in IT Programme Coordinator, the Deanship of Graduate Studies and Scientific Research (DGSSR) is responsible for overseeing all postgraduate programmes including the IT programmes. In part, overseeing the MSc in IT programme involves the task of ensuring that the ILOs are being appropriately covered, achieved, and measured. From interviews with relevant stakeholders, the Panel was unable to clearly see how the Deanship ensures the implementation of the policies and procedures relevant to the outcomes' coverage and achievement. In terms of improvement, the Panel advises the College to develop a clear and distinct definition for the link and collaboration existing between the DGSSR and the programme.

- In terms of principles and ethics of scientific research, UoB has developed a research charter that '…aims to set the fundamental rules to be adhered to, to complete the research process in terms of integrity, rights and ethics'. The Panel acknowledges the development of this Research Charter at UoB, which all stakeholders including students are expected to abide by. However, neither the SER nor the extra evidence submitted by the CIT, and not even the interviews, demonstrate how the students of the programme receive training in the principles and ethics of scientific research. As a result, the Panel recommends that the College should coordinate, preferably with the DGSSR, formal training sessions on the principles and ethics of scientific research.

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: *Addressed*

- From analysis of the relevant documentation and interviews with faculty and students, the Panel notes the programme's adoption of different teaching methods, as deemed appropriate and as per the types and levels of courses, and in compliance with the university Teaching and Learning Policy. Examples of these methods include interactive teaching, problem-solving, practical learning, independent learning, case-based analyses, and collaborative learning. This adoption of different teaching and learning methods was also confirmed through the programme's senior exit survey report which showed a student satisfaction rate of 100% toward exposure to a variety of teaching and learning methods. Overall, the Panel appreciates the range and diversity of teaching and learning methods implemented in the programme.

- As per UoB policy, the teaching and learning methods are expected to be included in all course syllabi. In addition, each teaching method must be linked to a set of CILOs, allowing to facilitate the attainment of these outcomes. Nevertheless, the Panel initially

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noticed that some courses (e.g., 'IT627-Intelligent Business Systems') do not refer to this linkage. However, during the extension visit, evidence was provided indicating that the course syllabi that were revised in 2021 now consistently include the mapping of teaching methods to CILOs. The Panel, thus, recommends that the College should continue mapping the teaching methods to CILOs in all the programme courses, and ensure the consistent documentation of this mapping in all course syllabi.

- With respect to e-learning in specific, the Panel notes from analysis of UoB's teaching and learning policy, that the statement `*Technology is integrated in the learning experience, where appropriate, to support delivery, engagement and assessment*' is about technology adoption and does not explicitly mention e-learning. However, it is evident from analysis of the relevant documentation and what was reported in interviews, that Blackboard is being used as the main e-learning platform, especially since the beginning of the Covid-19 era. The Panel also notes that some courses, such as 'IT603-Research Methodology and Professional Ethics', use other technologies like Dropbox instead of Blackboard to share teaching materials with students. Despite the adoption of these tools to facilitate e-learning, the Panel recommends that the College should clearly highlight e-learning in its teaching and learning policy, while incorporating additional details on it as a key learning strategy or approach.

- In line with the UoB Teaching and Learning policy, the learning experience that the students go through when completing their master studies focuses on participation in learning and exposure to professional practice/application. Student satisfaction with this experience is demonstrated *via* the results of the MSc senior exit survey that was completed in 2018-2019. The results show, for instance, that 88% of respondents were satisfied with the skills gained during the course of their studies and 94% expressed confidence in the knowledge acquired, as well as in their understanding of the field of study.

- The students go through a positive learning experience in terms of the research capabilities they develop in the programme. This is attributed mainly to the PEOs of the MSc in IT programme and to the set of guidelines that the CIT implements in the teaching of postgraduate courses. These include guidelines for faculty to utilize research papers' findings and activities in their lectures and encourage them to help promote students' research in general.

- There are guidelines implemented that help promote students' lifelong learning and these focus on learning skills; such as the guideline directing faculty members to engage students as much as possible in meaningful discussions, provide them with thought-provoking questions to tackle, and require them to practice giving presentations. This is in addition to encouraging students to attend and participate in conferences, symposiums, and forums, and inviting expert speakers from the industry to enrich the course material by linking it to recent trends in the field. The Panel appreciates the implementation of such guidelines in the MSc in IT programme that help promote students' research and innovation capabilities, as well as 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.

Judgment: *Addressed*

- UoB's academic units (colleges and departments) are equipped with a framework that encompasses all the necessary policies and procedures related to assessment. The Panel is satisfied with the different policies, procedures, and regulations associated with this framework. The Panel also notes that the College has built upon the university assessment framework by defining specific assessment strategy objectives, which aim to ensure that all assessments in the programme are reflected in the learning outcomes; are diverse and include both formative and summative assessment methods; include moderation of major assessments and examinations; are applied consistently and fairly; and involve the provision of prompt feedback. The Panel appreciates the existence of such assessment strategy objectives, which can help ensure the appropriateness, consistency, and fairness of assessments in the MSc in IT programme.

- All UoB Bylaws, regulations, and policies are, in general, posted on the university website, and these include those relevant to assessment. The Panel, however, finds that this way of dissemination does not suffice to make stakeholders aware of the different policies and procedures in place, especially the assessment-related ones. In fact, interviews with faculty, students, and alumni in the initial virtual visit demonstrated to the Panel the lack of consistency in defining such policies, like the anti-plagiarism one, where both 'plagiarism' and 'acceptable similarity rate' were not uniformly defined. Different similarity rates were reported, thus, raising concerns. However, further interviews with academics during the extension visit have indicated a greater awareness of assessment-related policies, likely due to the recent internal discussions and revisions of policies. Nevertheless, the College is encouraged to ensure, uniformly, across all relevant stakeholders, consistent understanding of all assessment-related policies and procedures.

- The panel's analysis of the relevant documentation indicated that there are different types of assessments, both formative and summative, and with proper marking criteria. The course syllabi that were made available to the Panel, in particular, clearly demonstrated this. In terms of feedback on student performance, the sample of examination papers that was reviewed by the Panel happened to be limited in terms of feedback and mainly included checkmarks and unreadable handwriting. In addition, the 2018-2019 senior exit survey revealed that only 75% of students agreed that grades are posted in a timely manner and offer the students enough time for review and feedback. As a result, the Panel recommends that the College should ensure that feedback on assessments is comprehensive and is presented within a reasonable timeframe, and that examinations' marked solutions should be made available for students, with students' grades posted in a timely manner, allowing enough time for students to seek feedback and clarification as they see fit.

- With respect to research, UoB's Research Charter aims at ensuring that scientific research is ethical and complies with principles of integrity, rights, and ethics. Despite what was reported in the interviews and the additional documentation that was submitted based on the panel's request, the Panel concludes that the implementation of this charter and how students embrace its principles remains unclear. As, the documentation shared with the Panel is more about plagiarism detection in specific rather than about conducting scientific research in ethical ways (e.g., how to seek approvals/consent when human subjects are involved in a research study; how to protect their confidentiality rights, etc.). Nevertheless, the Panel acknowledges the role of research supervision in the programme, which helps guide students in ethical research practice.

- Students in the programme are closely supervised by faculty members who provide them with necessary guidance and monitor their progress in completing their theses and programme. Guidance is usually provided during regular supervision sessions and office hours in which students' learning and personal needs are addressed. In particular, students receive help with identifying their research topics, preparing their thesis proposal, following their research timeline milestones, and balancing work and study responsibilities.

- In relation to students' works/achievements, in general, the College has a moderation policy that covers all the necessary steps for ensuring their rigour and fair grading. This policy includes internal pre-and-post moderation in addition to external post-moderation of major assessments and examinations and is in line with the University Study and Examinations Regulation, which helps ensure the proper management of examinations. However, the implementation of the moderation policy is a concern for the Panel (see Indicator 3.3). Nevertheless, from what was explained during the extension visit interviews, the Panel is confident that the recent review of the moderation processes, which took place after the virtual site visit, will increase the effectiveness of the process.

- The Panel notes that in terms of the final grades, their release to students is subject to a consistency check by at least two members of the examination and grade moderation committee, the course coordinator, and the Head of Department (HoD). Upon release, the students have the right to appeal their grades and ask for a re-grading/re-marking and verification of their grades if needed. Based on the interviews and submitted evidence, the Panel finds that the programme is supported by a good number of regulations and policies at the university level for addressing and handling of student cases of academic misconduct and appeals, such as: the UoB Study and Examinations Policy, the Regulations of Professional Conduct Violations, the Anti-plagiarism Policy, and the Guide to Student Rights and Duties. The Panel is thus satisfied with the guidance provided *via* these policies to help deal with academic misconduct cases and student appeals.

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: *Addressed*

- The MSc in IT programme has a set of admission requirements that follow the general admission criteria of UoB. These include graduation from a full-time Bachelor degree programme in IT, IT-related field, engineering or science, either from UoB or from a recognized university, with a Cumulative Grade Point Average (CGPA) of at least 2.67 or an equivalent grade. This is in addition to the requirement of providing two recommendation letters from previous professors or employers; passing an interview; and satisfying the English proficiency requirements for admission into a Master programme at UoB (i.e., 500 in TOEFL or a 5.0 in IELTS), which the Panel believes should be higher for entry into a graduate-level programme and recommends that the College, thus, adjusts them accordingly. In case the student applicant does not have the required IT background, they would have to complete up to three IT-related undergraduate level courses (three credits each) as deemed necessary by the Postgraduate Committee. These admission requirements, like UoB's admission policies and procedures, are clear, well-documented, and guarantee transparent, fair, non-segregate, and consistent admissions. They are published both in print and on the webpage of the DGSSR of the university website.

- Based on a review of the relevant documentation, the Panel finds that, apart from the English language proficiency requirements, the current admission criteria for the MSc in IT programme are appropriate and consistent with local and international standards, especially since they are annually reviewed on the basis of the ACM/IEEE curriculum guidelines for programmes in IT.

- The programme has remedial measures in place for students who do not meet all the admission requirements, in particular those with deficiencies in IT background, which the Panel finds appropriate. The programme also provides the option for students to externally or internally transfer from one programme to another within the CIT after completing at least one semester of enrolment, and subject to satisfying specific conditions reported in the Higher Studies Regulations and Appendices document. All external transfer cases are subject to satisfying conditions such as, for example, having their

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original university recognized by the Kingdom of Bahrain's Higher Education Council (HEC). The Panel is satisfied with the requirements that allow student transfer externally and between programmes and considers this as a potential factor constituting additional intake for the CIT and its different Master programmes. This is important especially since the Panel has concerns about the decline in the number of admitted students to the MSc in IT programme over the last four years.

- The Panel is concerned about the recent recommendation of lowering the current admission CGPA from 2.67 to 2.33, which is yet pending approval by the University Council. Nevertheless, the Panel, at the same time, acknowledges the annual revision of the admission requirements, conducted by the DGSSR and the College PSC, on the basis of the ACM/IEEE curriculum guidelines for programmes in IT.

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 hiring, induction, appraisal, promotion, and other faculty-related matters in the MSc in IT programme are well-articulated and in compliance with the university academic and administrative bylaws on recruitments. The hiring is done based on department needs for academic staff and in adherence to the college's recruitment strategy for the academic years 2017-2022. Once hired, all full-time and part-time faculty members receive an induction, during which they are introduced to the university Teaching and Learning Policy and the quality assurance and enhancement procedures among other things. At the college level, the HoD takes on the responsibility of introducing the newly-hired faculty members to their work environment, duties, and related policies and procedures. Interviews with faculty confirmed the value of these induction sessions at the university and college level. UoB also applies an appraisal system, which has clear appraisal criteria to evaluate the faculty members' performance. Evaluation results of performance are shared with the faculty members on an individual basis and then discussed in a meeting with the HoD, to help identify the faculty's areas of improvement and Professional Development (PD) needs. Finally, the University has set regulations for academic promotion, which are clear and well-disseminated, by which promotion applications of faculty are reviewed by three different committees at the department, college, and university levels before they are considered for approval by the University Council. Interviews with faculty revealed a good understanding of these promotion regulations. Recently, one faculty member got promoted and four others managed to submit their application for promotion from the rank of Assistant to Associate Professor.

- Research at UoB's academic units and centres is well-regulated through a research policy stating the types of research and publications accepted, the available funding, among

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other things. This research policy is accompanied by the DGSSR Research Charter that helps ensure the quality and integrity of the scientific research carried out by the faculty and students. Both the policy and the charter are supported by the DGSSR, which publishes relevant details about research applications' review and funding and conducts different research-related events for the benefit of faculty and students. Along the same lines, the CIT regularly organizes international conferences for faculty to publish and exchange their research with others.

- Based on an analysis of the relevant documentation, the Panel has concerns about the low research productivity in the CIT with respect to (i) the number of faculty and (ii) the dynamic nature of the IT field where many new developments happen on a regular basis. In addition, the Panel notes (i) the absence of a load reduction mechanism for faculty to engage in research, and (ii) the considerable number of faculty members who have extra-loads and who also engage in many service activities, such as committee work. The Panel, thus, recommends that the College should develop some mechanisms that allow more time for faculty members to engage in research. At the same time, however, the Panel notes some of the initiatives that the CIT's research committee plans to initiate in 2020-2021 to promote research among the faculty.

- As of the 2019-2020 academic year, the CIT had 72 full-time faculty members. The range of faculty members' teaching experience spreads from three to 33, with an average of 15 years. Although the Panel is satisfied with the faculty's range of academic qualifications and professional experience in the MSc in IT programme, the Panel is of the view that the diverse duties that some faculty members hold (e.g., administrative positions, serving on committees, and/or engaging in senior project supervision) may negatively impact their involvement in some of the core university's core functions (i.e., research and community service). The Panel also notes the low number of Professors (2/72=2.7%) in the College and encourages senior management to motivate faculty to apply for promotion as part of the faculty career development plan. This same observation was echoed by the College Academic Promotions Committee in 2018-2019.

- Faculty members at the CIT are encouraged to engage in different PD activities. Some of these are internally organized by the university's Unit of Teaching Excellence and Leadership. In the case of junior faculty (i.e., fresh graduates), they are expected to participate also in the Postgraduate Certificate in Academic Practice (PCAP) programme currently managed by UoB in alliance with a university in the United Kingdom. While the Panel appreciates the existence of these activities, the Panel finds them and the ones reported in the submitted evidence as having limited impact on faculty PD relevant to scientific research, which is particularly of value when working in a Master-level programme where strong research supervision capacity is expected. Besides, most of these activities are organized locally, and the Panel encourages participation in more international PD events that would provide the faculty members with greater exposure to the latest IT trends and would help enrich their academic and research skills and expertise.

- The annual faculty appraisal system at UoB assists in identifying faculty members to be retained and those who should be terminated, and all in compliance with both UoB and the Civil Service Bureau (CSB) regulations. Based on the SER and what was reported during interviews, the CIT has a high academic staff retention rate, which the Panel is satisfied with.

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*

- The MSc in IT programme is offered in the evening, thus allowing to accommodate those students who are employed. As a result, the CIT has an adequate number of classrooms and laboratories to run the programme without any challenges. In addition, access to shared facilities on the university campus, including the auditorium and general computing resources, is provided, as was confirmed to the Panel through the virtual site visit tour. Moreover, the occupancy rate presented among the submitted evidence shows that the laboratory and classroom facilities are adequate in number and size. Generally, the Panel confirms a good student and alumni satisfaction rate toward the university infrastructure, as was conveyed during interviews.

- With respect to IT, the University has a policy framework to support IT infrastructure on campus. Wi-Fi is available across the campus and university email is used for official communication. There is also an adequate number of specialized laboratories and general computing facilities, as was confirmed during the virtual site visit tour. The MSc senior exit survey data gives evidence that students are generally satisfied with the IT facilities on campus. Similarly, interviews with academic staff and students, confirmed to the Panel that there is general satisfaction with how the university's E-learning Centre has managed to support the transition of courses to online delivery, particularly during the COVID-19 phase.

- UoB has a central library and five specialised libraries. The Science and IT library supports the MSc in IT programme by having adequate resources, such as printed books (5037), electronic journals (1104), electronic books (19,316), and subscriptions to electronic databases (45). In addition to the formal study areas in the library, there are adequate informal study spaces including those for students with special needs.

- The departments' IT technicians, with the help of the IT Centre, directly manage and maintain the College's IT facilities by regularly checking and reporting on the state of computing facilities and recommending replacements or upgrades as needed. Other maintenance is carried out by the maintenance team on a regular basis and also based on special requests, and there is a formal online helpdesk mechanism to manage specific

requests for maintenance. As for the annual planning of resources at the College, the Panel notes that this is undertaken by the College Resources and Maintenance Committee, which also reviews the maintenance reports and the resources required and reviews the progress made on facilities and resources annually. However, the Panel found that there are laboratories that have Personal Computers (PCs) that are older than five years; although as per UoB policy on PC replacement, PCs are replaced or upgraded once in three-to-five years. The Panel thus encourages the University to adjust its policy on PC replacement to include multiple factors other than duration in years alone, in order to ensure the fitness of purpose of PCs, and also to follow the revised policy consistently.

- In terms of health and safety, UoB has laboratory safety guidelines for users and general security and safety procedures for all stakeholders, which help guide the health and safety of campus operations. These are complemented by escape exits, automatic fire doors, fire extinguishers, first aid kits, and evacuation procedures, spread around the campus facilities, and also by safety and evacuation training sessions that are conducted regularly on campus. The Panel finds these arrangements for ensuring the health and safety of students and staff on campus satisfactory.

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*

- UoB's Student Information System (SIS) is used for multiple purposes and provides a range of student data including personal and academic information, registered courses, attendance, progress, and transcripts. The portal of the SIS also enables student feedback on courses, grade appeals, and academic advising. From interviews, the Panel confirms that data is drawn from the SIS for the preparation of the annual self-evaluation reports of the MSc in IT programme. The Panel, however, found that these reports do not consider student progression, retention, and graduation parameters. Thus, overall, the Panel notes that the SIS is a sophisticated decision-making tool at UoB but simultaneously suggests that additional facilities such as improved cohort analysis and the inclusion of its results in annual reports would be worthwhile.

- The SIS provides features that enable HoDs and other management teams at the College to access varied types of information on, for example, the available resources, student registration, and expected number of students who would graduate in a semester, which assist in different types of decision-making processes. To mention only a few, the data/reports generated from the SIS help senior management decide on the specific set of courses/sections to be offered; allocating and scheduling faculty load and student timetables; how to create class-laboratory combinations; and how to determine maximum capacity size for each class.

- The SIS implements several access authentication mechanisms and access control to protect student data and ensure its confidentiality and integrity. UoB also has policies and procedures in place to check the accuracy of results and security of learners' records. There is also a regular backup and recovery of data based on a risk management plan, all of which are mechanisms and procedures that the Panel is satisfied with. The Panel also confirms from interviews that the process of tabulation is automated on the SIS and that the accuracy of the student results is cross-verified by the course instructor, programme coordinator, and HoD.

- The Panel confirms from submitted evidence and interviews with the college administrative and academic staff, that there is a clear and multi-level monitoring mechanism in place to ensure, with the help of the SIS, accuracy of the awarded student certificates and transcripts and their issuance in a timely manner.

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: *Partially Addressed*

- UoB provides various support services for students through its libraries, laboratories, E-Learning Centre, clinic, and counselling department. Most of these services are overseen by the Deanship of Student Affairs. Students at risk of academic failure, in particular, constitute a group that receives targeted counselling and assistance from the counselling department. From interviews with various groups of stakeholders, the Panel confirms that appropriate student support is being provided through the healthcare clinic and counselling department. Similarly, appropriate support is available through the college laboratories *via* the technicians they employ, and through the university library, which in addition to all the services it provides, delivers information literacy training to enrolled students in addition to the library orientation programme for newly admitted students.

- The MSc in IT students also have the opportunity to benefit from a range of services provided by the Career Counselling Office at UoB, despite the fact that most of them are already working professionals. This office organizes a career day for student-employer interactions, informs students about opportunities for employment, and raises awareness about university–industry collaborations. During interviews, the Panel found that students in the programme were not aware of the career counselling services offered by the University. The Panel also noticed that students and graduates rely heavily instead on their course instructors to learn about career prospects. In consequence, the Panel recommends that the College should raise students' awareness about the career counselling services available at UoB and encourage them to make the utmost use of them.

- Another form of support provided for all newly admitted students is the formal induction organized by the DGSSR. In it, students are introduced to the rules and regulations of the

university, college, and programme. This induction is followed by another one at the college level in which students are introduced to key members of staff overseeing their programme, and are provided information about the College rules and regulations and about the student support mechanisms and facilities in place for them. Interviews with students confirmed their satisfaction with the induction processes available at both the university and college level.

- Once in the programme, every student is assigned an academic advisor. Advisors have online access to student data and can communicate with, and advise, students on various matters. However, the Panel noticed that the advising activities are largely restricted to course selection decisions during the registration period. A recent MSc senior exit survey indicates mixed responses about student satisfaction with advising, as there are those who expressed high satisfaction with their advisors' performance and those who did not. It was clear to the Panel, during the students and alumni interviews that many students prefer resorting to particular professors for help or advice over going to their academic advisors. The Panel therefore advises the College to look for ways that help accentuate the important role of the academic advisors beyond course registration purposes, and that simultaneously encourage students to make better use of their advisors' services.

- At UoB, there is an emphasis on inclusion of students of both genders as well as of students with special needs. As for inclusion in terms of gender, the University puts an effort in ensuring that equal opportunities are available for both men and women when it comes to admission, support services, and training opportunities among other things. There are also mechanisms in place to support students with special needs. For example, the University provides special transportation arrangements for students with mobility challenges and, in general, the campus is equipped with ramps and elevators to make facilities more accessible. In addition, the University Students' Services and Development Department has a disability division that specifically provides a range of support services and recreational activities for students with disabilities, such as the visually impaired.

- Students at risk of academic failure are also provided with special support services, starting with specific mechanisms that help identify them and their needs, to calibrating the SIS to send them special notifications and reminders to meet with their advisors, who are supposed to guide them on how to improve their performance and document these meetings and their advisees' progress. The Panel, however, was unable to find a specific system in place to continuously assess students' progression and provide timely interventions accordingly. The Panel, thus, recommends that the College should take the necessary steps needed to evaluate the support provided to at-risk students; explore the possibility of developing student progression monitoring *via* the SIS; and use the information for continuous monitoring of students' performance and for timely interventions.

- In general, UoB has a number of mechanisms in place for eliciting student feedback about the effectiveness of the support services it provides students with. For example, surveys (e.g., student's experience survey; senior exit survey; alumni survey) are an effective

mechanism used to collect such feedback and enact improvements accordingly. Feedback collected from students by the College Committee on Resources and Maintenance is also another mechanism, which helps identify, on an annual basis, requirements in terms of resources needed to support students' needs. The PSAC is also another source of feedback that the programme relies on, and to which decisions/changes made based on student feedback are reported. Although the Panel understands that the general expectation is that the PSAC would disseminate information about new decisions or changes made by the management to their peers, the Panel still recommends that steps should be taken by the College to formally inform the wider student body about actions/improvements undertaken in its support services based on student feedback.

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Standard 3

Academic Standards of Students and Graduates

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

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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: *Addressed*

- In line with UoB's Regulations of Study and Examinations and the Higher Studies Regulations, different assessment methods (e.g., examinations, assignments, and projects) are used by the CIT faculty for assessing students' knowledge and skills. To maintain academic standards of the programmes, all examinations are subject to internal moderation. In addition, some external moderation takes place. While relevant policies exist, the Panel noticed at the time of the virtual visit that the depth of some courses was insufficient for the Master level. External moderators also raised this concern stating that some topics needed to be updated. In addition, some assessment methods were not appropriate for a Master level, as they were too simple or tended to rely heavily on multiple-choice, true/false, or fill-in-the-blanks questions. However, the comprehensive review of all course syllabi before the extension visit rectified these issues. Course syllabi now contain up-to-date topics that are appropriate for the Master level as well as assessment tools that can determine the achievement of skills learned. Furthermore, the Guidelines for Postgraduate Programs Teaching, Assessment, Exam Moderation, and Quality Assurance were updated in May 2021 and now explicitly recommend assessment tools appropriate for the Master level while discouraging multiple choice questions. Considering this, the Panel emphasizes that it is important that UoB monitors the implementation of the recently revised syllabi and guidelines.

- Each course syllabus contains details about the alignment of assessments to the CILOs. This alignment is verified through pre-moderation. The course syllabi also link the CILOs to the PILOs, which as was mentioned earlier (in Indicator 1.2), are aligned with the PEOs that are themselves aligned with the UILOs in which the graduate attributes are embedded. Moreover, course portfolios are utilized in the College as a part of the structure meant to ensure ILOs coverage and achievement. While the Panel noticed at the time of the virtual visit that some portfolios, were empty or incomplete, the Panel received evidence during the extension visit that portfolio completeness is now being enforced by the QAC. Comprehensive checklists have recently been developed to help academics

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submit complete course portfolios. These portfolios contain extensive information about all aspects of the course, including the achievement of CILOs and PILOs.

- One way of measuring the achievement of PILOs in the MSc in IT programme is through the mapping of CILOs achievement. In the programme, a well-developed spreadsheet is used to directly measure the achievement of CILOs and PILOs through the achievements of students in assessments (e.g., tests, quizzes, assignments, laboratory experiments, and projects). The completed spreadsheet becomes a part of the course portfolio in the end. PILOs achievement in the programme is also measured indirectly, alongside the attainment of the PEOs and the overall effectiveness of the programme, through the survey results of graduating students, alumni, and employers. These surveys are evaluated/analyzed, and action plans are developed based on their results.

- As for monitoring the implementation and improvement of the assessment process, the QAC checks consistency, level, and quality of assessments using course portfolios submitted by the faculty members. The committee also prepares an annual PILOs assessment report based on the achievement levels of the PILOs through the CILOs and discusses this with the PSC to decide on necessary improvement actions that are incorporated into the programme's annual self-evaluation report. Then, the QAC and PSC become responsible for the follow-up on these actions.

- At the time of the virtual visit, the Panel noted that the course portfolios contained only limited or no conclusions based on the spreadsheet reports, which made it difficult to determine the level of PILOs achievement through each course or whether the courses were being taught in a way that ensures the attainment of ILOs. However, the Panel learned in interviews during the extension visit that the recent revision of the course portfolio checklists and the increased focus on the review of course portfolios by the QAC will ensure a more detailed analysis of the attainment of learning outcomes. The modified Guidelines for Postgraduate Programmes also show that the minimum level for the successful achievement of a learning outcome has been raised to 80%. Now, according to the Panel, what remains essential is that the QAC monitors the thoroughness of the action plan developed by academics at the end of each course delivery.

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*

- Policies and procedures related to academic integrity and scientific research ethics at UoB apply to both students and faculty. The Deanship of Student Affairs is responsible for policies and procedures related to student academic integrity in terms of types of misconduct cases, consequences, and penalties. General regulations of study and

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examinations are also established. Whereas, the Bylaw of Faculty Members, issued in the Board of Trustees Decision No. (1) of 2006, describes the academic disciplinary system of the University as well as the disciplinary measures as they apply to faculty. Finally, policies, procedures, and regulations regarding academic integrity are included in the Research Charter and in booklets and distributed to all students including freshman and new faculty during the respective induction programmes.

- UoB relies on plagiarism software (Turnitin and SafeAssign) to detect similarity in assignments and cases of academic misconduct. At the time of the virtual visit, plagiarism was assumed if similarity exceeded 25% and the Panel learned during interviews that processes were not applied consistently, with only a small number of assignments having been submitted through the plagiarism software. In addition, the Panel had learned from academics that any assignment that did not exceed the acceptable 25% similarity level was considered free of plagiarism. However, the revision of the CIT Plagiarism Guidelines in May 2021 rectified these issues at least partially. The Panel was informed during the extension visit that instructors are being encouraged (although not required) to use plagiarism detection software (Turnitin for theses and SafeAssign for other assessment types). This change has been communicated by the Dean to academics. Training in the use of SafeAssign has also been provided. Also, although acceptance thresholds are still defined, the CIT Plagiarism Guidelines emphasize the importance of instructors using professional judgment rather than sole reliance on similarity values/percentages.

- UoB did not have any information for the Panel on plagiarism cases of students or academics from the last few years. Additionally, the Panel learned from interviews that students have the option to resubmit any assignment that exceeds the 'acceptable 'similarity level as often as needed to reduce the similarity. Accordingly, the Panel recommends that the College should require faculty to consistently and regularly utilize the available plagiarism detection software to check the authenticity of students' submitted works, record all cases of academic misconduct, and take appropriate actions to deter them.

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: *Partially Addressed*

- The moderation process in the CIT is well-articulated and contains the typical stages of internal pre-moderation, internal post-moderation, and external moderation. The pre-moderation process uses a form that is submitted to the Course Coordinator and to the QAC of the programme. The internal moderator for a course is expected to be familiar with the content of the course to be moderated or should have taught the course in the past. The internal moderator is appointed by the Chair of the QAC and approved by the

same committee. At the end of the examination period and upon receipt of the moderation forms, the committee analyzes the semester's moderation and prepares improvement plans, if deemed necessary. Examples of meaningful pre-moderation feedback by the internal moderator, as well as meaningful post-moderation feedback, were provided to the Panel.

- Suggestions for improvement made because of the moderation process are included in the college's annual self-evaluation reports that were submitted to the Panel as evidence. The 2018-2019 and 2019-2020 assessment moderation reports do not indicate any major issues of relevance to quality assurance requirements.

- In the panel's opinion, the internal moderation process is generally well-defined. Previous issues related to inadequate assessment methods (see Indicator 3.1) have been addressed through the several revisions undertaken prior to the extension visit which allows the internal moderation to be more effective.

- With respect to external moderation, it is conducted according to the college's moderation plan. Feedback from external moderators is collected by the Programme Coordinator and the programme's QAC. For the Master thesis, external examiners are appointed by the PSC. In interviews during the review of the programme, the Panel learned that external moderators were informally selected without any formal selection criteria. Also, the timeline of the external moderation was not coordinated with the examination period and, therefore, the external moderator did not play a role in assessing the fairness of grading. Therefore, the role of the external moderator was more like an informal programme and course reviewer than an examination moderator. In addition, the external moderation process appeared to be ad-hoc rather than planned. However, before the extension visit (and specifically in June 2021), a more coordinated approach of external moderation was established with King Fahad University of Petroleum and Minerals (KFUPM) and the issues of moderators' selection and implementation of moderation according to a timeline were addressed. This was an important step towards a more planned and systematic approach for the external moderation process. Nevertheless, the Panel advises the College to implement formal memoranda of understanding for external moderation with carefully selected institutions.

- Like the internal moderation process, the Panel finds the external moderation process well-defined. However, the course coordinators' action plans indicate that the loop of the moderation process is not up till now completely closed, as the implementation of the suggested improvements is yet to be monitored. The Panel recommends that the College should develop a mechanism through which a formal evaluation of the effectiveness of the external moderation process is carried out on a regular basis.

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: *Not Applicable*

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 Master thesis constitutes a culminating experience for students in the MSc programme and students can register for it after completing 27 credit hours with a minimum CGPA of 3.0 out of 4.0. Upon registration, students select one of the approved thesis topics that faculty have put forward. The mapping of the thesis's CILOs to the PILOs submitted as evidence illustrates how the thesis makes an important contribution to the achievement of the PILOs.

- The Higher Studies Regulations of UoB detail the postgraduate admissions, study regulations, supervision, examination, and support for postgraduate students. These regulations are published on the university website for all relevant stakeholders and cover the responsibilities of research supervisors and students alike. In addition to proposing the thesis topic, the supervisor plays a role in guiding the student in the writing of the thesis proposal and in assessing the performance and progress of the student against the thesis study plan, while providing the student with timely and thorough constructive feedback as necessary during all stages of their thesis project. However, the Panel noticed that the proposal approval process is lengthy and cumbersome (See Indicator 3.6).

- UoB's Master and PhD Thesis Procedures stress the importance of continuously monitoring and reviewing the progress of students in the thesis. Thesis supervisors must submit progress reports about their students every semester. All progress reports are submitted to the Master Programme Coordinator, Master programme PSC, and PSC of the University. In interviews, the Panel learned that two unsatisfactory progress reports result in the failing of the thesis. However, the course syllabus of the thesis course 'IT699' does not mention progress reports nor the possibility of failing the thesis due to lack of progress. The Panel recommends, therefore, that the College should revise the syllabus of the 'IT699-Thesis' course to reflect current implemented practice in relation to progress reports and their consequences.

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- The Higher Studies Regulations guide the assessment of the Master thesis. This assessment is well defined and done rigorously with a set of evaluation criteria and the involvement of an examination panel that is nominated by the PSC and includes the supervisor (chair), an internal examiner, and an external examiner. When approval of the two examiners is granted on the validity of the thesis, the thesis defense/viva is scheduled by the PSC. In terms of grade distribution, the examiners mark the thesis on the basis of two components: the thesis report, which is allotted 70% of the total grade and the thesis defense/viva which is allotted 30%. The Panel notes that each thesis is evaluated by an external examiner in addition to an internal one, which helps ensure that the thesis component in the programme is appropriate and at a similar level of those in equivalent programmes.

- In line with continuous improvement, the thesis procedure is reviewed and monitored regularly. In its last review, several modifications resulted, which were submitted to the Panel as evidence and which the Panel found to include meaningful changes (e.g., clear criteria for the thesis evaluation were assigned and also a pass/fail grade for the thesis component). Moreover, the requirement of credit completion before registering for the thesis has been changed from 27 to 24 credit hours. Finally, the thesis topic had to be first approved by the University Council before the student could write his/her proposal, which with the new revision was no longer a requirement, as, the student could submit for approval the proposal and the chosen topic at the same time.

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: *Addressed*

- The SER claims that, through their achievements, the programme's students demonstrate the ability to create and innovate. Despite this claim, the Panel could not find much evidence for innovation in the SER nor in the course portfolios at the time of the virtual visit. The Panel was of the view that the level of academic rigor needed further improvement in order to promote student's creativity and innovation. However, as already mentioned earlier (see Indicator 3.1), a comprehensive review of all course syllabi before the extension visit was conducted to improve the level of academic rigor. Furthermore, new evidence was provided indicating that several student projects resulted in publications, demonstrating appropriate depth of courses.

- As for the graduation rates in the MSc in IT programme (number of graduate students over enrolled and admitted students), these have varied over the last four academic years. The rates are 13.7%, 8.1%, 26.5% and 21.2% in 2015-2016, 2016-2017, 2017-2018 and 2018-2019, respectively. Given the non-standard definition of the graduation rate used at UoB, the Panel was not able to comment on it. In addition, the Panel learned in interviews that UoB has not carried out any benchmarking of graduation rates with other institutions.

Whereas, with respect to length of study, the Panel learned from interviews with students and graduates, that the programme duration is longer than they had initially anticipated, and that although students are expected to graduate in two years from registration, many of them go beyond the period of two years due, for example, to late identification of research topics for their theses. While the Panel acknowledges the regular support of the students' learning needs provided and the existence of the students' research timeline for MSc programmes that was proposed by the DGSSR and approved by the University Council; the Panel encourages the DGSSR in collaboration with the MSc in IT Programme Coordinator to enforce this timeline through, for instance, speeding-up the process of approving research proposals. Along the same line, the Panel is of the opinion that having two faculty reviewers for every master proposal, as is the case now, extends the approval timeline for unnecessary reasons. As a result, the Panel advises that this issue be addressed.

- The CIT follows up on student progress and graduate employability through surveys. To this end, it collects details about the graduates' positions every three to four years to analyze the compatibility of the programmes with the demands of the job market and employment opportunities. The results of the graduate destination are included in the annual self-evaluation reports. Upon review of the relevant documentation which shows graduate employability rates based only on public *versus* private sector, the Panel encourages the CIT to improve this tracking by, for instance, identifying the main areas/fields (e.g., finance, healthcare, and oil) where the master graduates are employed.

- The SER indicates a 100% employability rate among the graduates of the master programme with 71% in the public sector and 29% in the private sector. However, the report does not indicate for which year these numbers have been obtained. Another employability rate, 86%, has been obtained for 2017-2019. For the same period, 36% of the graduates were employed in the private sector and 64% in the public sector. Overall, the Panel finds the employment rates very good. Additionally, the Panel learned from interviews that employers prefer to hire UoB graduates due to the high level of knowledge and skills they receive. Similarly, positive feedback was received from alumni of 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: *Partially Addressed*

- Quality assurance in the programme is enabled by the Quality Manual, Quality Assurance and Enhancement Policy, and Programme Quality Assurance and Enhancement Policy. The Panel confirms that there are institutional mechanisms at the university, college and department levels to review the quality assurance policies. Also, there are portals for communicating the policies to all stakeholders, such as the Quality Assurance & Accreditation Centre (QAAC) webpages and several printed documents in which the policies are published.

- UoB's Programme Quality Assurance and Enhancement Policy provides the framework for programme-level quality assurance management and constitutes an integral component of the quality assurance management system in place. Additionally, there are specialized committees at the university, college, and department level (e.g., the Quality Assurance and Accreditation Executive Committee (QAEC), the College Accreditation Committee (CAC), Department Accreditation Committee (DAC) etc.) that oversee the quality assurance of academic programmes and their outcomes. At the college level, there is a Quality Assurance Office that ensures consistent application of all quality assurance practices across the College and which works closely with the departments' accreditation committees. The different committees of the College prepare initial annual plans, and at the end of every academic year submit a progress report accordingly. The Dean of the College holds meetings with the chairs of the committees to review progress and plan for coordination. The MSc in IT programme itself also has its own committee responsible for quality assurance and continuous improvement within the programme, the QAC, which follows a specific operational plan to review the PEOs, PILOs, course portfolios, and survey data. The QAC also produces the programme's self-evaluation reports, which are prepared by considering various aspects of the programme and stakeholders' feedback.

- The CAC is mandated to ensure compliance, assessment, and accreditation across all departments and programmes. The meeting minutes submitted among the supporting materials contain evidence of the committee pursuing this mandate to some extent. Whereas the QACs of programmes are mandated with the responsibility of continuous

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improvement at the programmes' level. The QAC of the MSc in IT coordinates with staff members to facilitate the implementation of quality assurance practices, and consistency is attempted through the implementation of set operational plans. From interviews, the Panel found inconsistencies in the application of policies and procedures (e.g., plagiarism policy) relevant to the MSc in IT programme (see Indicator 3.2). The Panel, thus, recommends that the College should evaluate the mechanisms used to ensure the consistent implementation of quality assurance-related policies and procedures.

- Capacity building and awareness sessions related to quality assurance are held for faculty members by the College Quality Assurance Office. This is in addition to awareness being raised about quality matters during committee meetings. From interviews with the college's administrative and academic staff, the Panel found that there are many committees in the College, and that the responsibility of quality assurance is distributed among these committees with little focus on role-based/individual quality assurance responsibility. As a result, the Panel recommends that the College should raise awareness about quality assurance policies and procedures and inculcate a quality culture through which the understanding of individuals' roles is enhanced, to ensure widespread effectiveness of quality matters.

- With respect to monitoring, evaluating, and improving the quality assurance management system, a mechanism for this is included in the Quality Manual. The University QAAEC is expected to review quality assurance policies and procedures at the university level; while the CAC is expected to review compliance and accreditation activities at the college level, and the programme QAC to review the programme-level quality assurance management processes. In terms of the CIT's quality assurance management system, this was internally reviewed by the QAAC in April 2019, to assess its effectiveness. While the Panel acknowledges this type of review, the Panel finds based on the submitted evidence and interview reports that the quality assurance management system is reviewed sporadically. The Panel, therefore, recommends that the College should evaluate the mechanism for monitoring, evaluating, and improving the quality assurance management system and make it more systematic. In addition, the Panel noticed that the CIT does not have any formal agreements with external reviewers to assess the effectiveness of its quality assurance management system; although, it was further found that steps are being taken in this direction. The Panel, as a result, encourages the College to expedite this step.

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 programme management and leadership include the Dean of the College, Quality Assurance Office Director, Head of the Computer Science Department, the PSC, the QAC, and the Programme Coordinator. In addition, the College Council provides leadership at

the College level and sets the strategic direction of the programme, provides it with support and monitors its progress; while the Department Council chaired by the HoD is responsible for the academic and administrative operations of the programme. From interviews and the review of evidence, the Panel arrived at the conclusion that the programme is being guided and managed appropriately by means of the current organizational structures and hierarchies in place.

- Assisting the College with the management of the programme is a set of multiple committees at the department, college, and the university levels that link the decision-making process across the different levels of the University. There is representation of the Department of Computer Science in the college and university level decision-making committees. From interviews with faculty and administrative staff, the Panel concluded that the existing reporting lines are clear and support and facilitate adequate communication and decision-making across the College.

- All committees have clear terms of reference stated in the Quality Manual. Additionally, at the stage of committee formation, the decision letter that goes out to the committee members always describes the roles and responsibilities of the committee along with its objectives and membership. The Quality Manual also includes job descriptions of leadership positions and faculty members; while, the Faculty Members Bylaw includes the roles, responsibilities, and authorities of key personnel, such as the University President, Deans, and HoDs. Based on this and on the review of the relevant documentation, the Panel is satisfied that all committees' responsibilities and duties of management positions are clearly stated.

- The clarity of the different managerial positions and of the terms of reference of the committees at various levels helps identify where different academic and administrative responsibilities lie, and who exactly is responsible for the custodianship of the academic standards of the programme at the different levels: department, college, and university. This was confirmed to the Panel from interviews with college administrative and academic staff.

- With the effective organizational structures and hierarchies in place to guide and manage the programme; the clear reporting lines that support communication and decision-making across the College; and the well-defined managerial positions and clear roles and responsibilities, the Panel is of the view that the current management of the MSc in IT programme is appropriately demonstrating effective and responsible leadership.

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*

- At UoB, there are policies and organizational arrangements in place for annual and periodic reviews of academic programmes. The annual self-evaluation reports of the programme are prepared by its QAC based on a range of different data sources, such as: course details; results of course evaluations conducted by the QAAC every semester; feedback from the department committees, PIAC, and PSAC; and survey results. One of the main objectives of the self-evaluation reports is to annually evaluate the achievement of PEOs by evaluating the achievement of the PILOs and CILOs. The summary of the evaluations and the recommendations made based on the Department Council meetings, meetings with the PIAC, and other data sources mentioned above, are all documented in the self-evaluation reports.

- The QAAEC, CAC, the college QAC, and PSC, are the entities expected to monitor the implementation of the improvement plan recommendations made after the annual evaluation. Whereas the College Council oversees this implementation through discussions about it in its regular meetings. Although the Panel found improvements made to the programme at various levels as a result of its annual reviews and the improvement plans resulting from them; the Panel, however, noticed that there is a lack of coordinated effort to systematically review/evaluate the progress made on the improvement plans. Moreover, the Panel also noticed issues and poor documentation practices followed in the preparation of the evidence for the self-evaluation reports (including the one submitted to the BQA). The reports also do not consider data such as student progression, retention, and graduation rates adequately (see the below recommendation).

- All academic programmes at UoB, including the MSc in IT programme, follow a well-structured university review plan according to which the periodic reviews are held, as per the Programme Quality Assurance and Enhancement Policy. This policy stipulates the collection of feedback from a multiplicity of sources, namely internal and external stakeholders and results of evaluations of ILOs achievement and of the effectiveness of the curriculum; while, the university review plan encompasses internal reviews as well as external reviews conducted by international accrediting bodies, national agencies, and external stakeholders.

- The last periodic review of the programme took place in April 2019 as a part of the internal review of the CIT. In this review, multiple sources of feedback were relied on, whereby the programme's QAC collected feedback, for example, from the PIAC, PSAC, stakeholders' surveys, course portfolios, course evaluation reports and results, and benchmarking reports. This was further confirmed to the Panel during interviews with various stakeholders. The recommendations that resulted from the review were considered by the QAC and are reflected in the self-evaluation reports of the programme.

- Similar to what takes place in the programme annual reviews, the QAAEC, CAC, college QAC, and PSC are responsible for monitoring the implementation of the periodic review recommendations. Again, while the Panel acknowledges the process in place for periodically reviewing the MSc in IT programme, the Panel nevertheless notes that the review/evaluation process of the progress made on the implementation of

recommendations is neither systematically done nor documented. The Panel, therefore, recommends that the College should work on improving the documentation of evidence for the preparation of the SERs and should ensure that the process of follow-up and improvement be systematically implemented and evaluated.

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: *Partially Addressed*

- UoB's Benchmarking policy provides the necessary framework for the various entities of the University to undertake benchmarking. Benchmarking of the programme was attempted with similar programmes offered by a select set of 11 international universities from across the world in 2019-2020. The benchmarking that took place was informal in nature, and the Panel was informed that the College has not yet created a systematic mechanism for entering into formal benchmarking agreements. However, it was further confirmed to the Panel that steps are being taken in this direction. The Panel, therefore, advises the College to work on expediting these steps. Moreover, from interviews, the Panel found that the benchmarking exercise conducted was limited mainly to the benchmarking of the curriculum (see Indicator 1.2). The Panel, thus, recommends that the College should conduct a more comprehensive benchmarking exercise of the programme, covering different aspects and components of the academic and administrative activities and services it provides.

- The Panel noticed from the review of the relevant documentation that the limited benchmarking that has taken place so far has managed to inform the review of the programme. This applies in the case of the benchmarking exercise that was conducted in 2012-2013 and, more recently, in 2019-2020. However, the revision to the programme as a result of the latter benchmarking exercise has not yet been implemented, as the revised programme is still pending approval from the University Council. Nevertheless, the Panel was able to confirm through interviews and a review of the evidence submitted that minor modifications have been made to the programme in both instances. These modifications included, for example, the deletion of certain courses and changes in the assessment of courses.

- In addition to benchmarking results, the MSc in IT programme benefits also from the feedback collected in the form of structured comments from internal and external stakeholders, including faculty, students, graduating students, alumni, and employers. Feedback is also collected through the programme's advisory committees, the PIAC and the PSAC. From the submitted documentation, the Panel was able to find evidence of such inputs being used to inform decision-making processes in the programme. For example, information gathered was used for initial development and revision of the programme in

2012-2013 (subsequently offered in 2014). More recently, a modified MSc in IT programme has been prepared on the basis of the inputs from surveys and reports among other sources of data. Additionally, the Panel confirmed from interviews that survey input informs programme-related decisions. To mention only a couple of examples, the decision to reduce the number of students' assessments was made based on feedback collected from the students; while the decision to add more technical components to the programme was made in response to feedback from the PIAC.

- The mechanism relied on in the programme for implementing improvements based on survey results involves using the collected feedback for the development of action plans, aiming at improving different aspects of the programme (e.g., curriculum, assessments, skills' development). Once all the feedback is analyzed, committees are assigned to start implementing different improvements included in the action plans. The progress of the committees is then monitored by a number of different quality assurance entities at the department, college, and university levels (e.g., QAAEC, CAC, QAC). As claimed in the SER, implemented changes are communicated to the different stakeholders in official meetings (e.g., PIAC meeting, PSAC meeting, faculty meeting). Despite this claim, however, the Panel concluded from interviews with various stakeholders that the mechanism to communicate the outcomes to the stakeholders in a systematic manner is weak. The Panel, therefore, recommends that the College should evaluate the mechanism of communicating to stakeholders the changes or decisions made on the basis of their feedback.

- In terms of stakeholders who are aware of the specific changes made to the programme based on their feedback (e.g., members of the PIAC, alumni), the Panel notes general satisfaction on their part toward the programme's responsiveness to their feedback and suggestions. This was confirmed to the Panel during interviews with various groups of stakeholders.

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*

- As mentioned earlier, the MSc in IT has an industrial advisory committee, the PIAC, with clear terms of reference that regulate and guide the duties of its members. The PIAC comprises employers, alumni, and representatives from the public and private sectors, who meet as a committee once a year. The aim of the PIAC is to contribute to the design and review of the programme's curriculum, enhancement of course delivery, and general improvement of the programme.

- From a review of the relevant documentation and from what was reported during interviews, the Panel was able to find evidence that the feedback of the PIAC is being used to inform decision-making processes in the programme. Some examples of changes made to the programme as a result of PIAC feedback include: the addition/replacement of courses; the shifting of courses from the electives list to the core courses list; and setting rules related to the maximum duration of the thesis.

- The value of the PIAC lies mainly in offering the programme insight into what is needed by the labour market and by society, so that it prepares its graduates accordingly. Thus, PIAC members provide the programme inputs based on external market perspectives. The mechanisms used to elicit such feedback from the PIAC take the form of annual meeting discussions that are documented in minutes of meetings.

- The student, alumni and employer surveys are additional mechanisms relied on in the programme to understand the labour market and societal requirements. Labour market studies also fall in the same category. In addition to relying on the findings of existing labour market studies conducted by other organizations (e.g., TAMKEEN), the CIT conducted its own studies to ascertain the validity of the programme and to investigate the requirements of IT fields and skills needed by the market. The Panel acknowledges the value of these studies in keeping the programme relevant and up-to-date.

- Finally, all results from the labour market studies, surveys, and PIAC meetings are discussed by the programme's QAC and considered in the annual self-evaluation reports. They are also translated into improvement action plans as necessary. The Panel was able to find evidence that the QAAEC follows up on these action plans, and interviews confirmed to the Panel that monitoring and review of these mechanisms takes place. The Panel, however, was unable to find what indicates a systematic and well-documented monitoring and review process of these important mechanisms, which help ensure that the programme meets labour market and societal needs. The Panel, thus, recommends that the College should review and evaluate the mechanisms used to ensure that the programme meets labour market and societal needs.

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V. Conclusion

> **Taking into account the institution's own self-evaluation report, the evidence gathered from the interviews and documentation made available during both the virtual visit as well as the extension 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 Master of Science in Information Technology of College of Information Technology offered by the University of Bahrain.**

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

1. The clear academic planning framework in place, outlining the main educational objectives of the Master of Science in Information Technology programme and how these objectives contribute to the achievement of the university's mission and vision.
2. The continuous update and review of the programme's study plan, which the Panel finds appropriate in terms of addressing some existing concerns in the current curriculum, such as depth and rigor of topics covered.
3. The range and diversity of teaching and learning methods implemented in the programme.
4. The implementation of guidelines in the programme that help promote students' research and innovation capabilities, as well as lifelong learning skills.
5. The existence of assessment strategy objectives, which can help ensure the appropriateness, consistency, and fairness of assessments in the programme.
6. The existence of professional development opportunities that help enhance faculty members' academic performance.

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

1. Develop a plan for the identification and management of potential risks that could threaten the quality, delivery, and academic standards of the Master of Science in Information Technology programme.
2. Revise the Programme Educational Objectives and the Programme Intended Learning Outcomes to include entrepreneurship.
3. Benchmark all ILOs in the programme, to revise them in a manner that ensures a higher degree of their appropriateness for the type and level of the degree awarded and alignment with international norms.
4. Ensure that all the 2021 revisions in the course syllabi be reflected in the delivery of the programme.
5. Coordinate, preferably with the Deanship of Graduate Studies and Scientific Research, formal training sessions on the principles and ethics of scientific research.

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6. Continue mapping the teaching methods to Course Intended Learning Outcomes in all the programme and ensure the consistent documentation of this mapping in all course syllabi.

7. Clearly highlight e-learning in the College of Information Technology teaching and learning policy, while incorporating additional details on it as a key learning strategy or approach.

8. Ensure that feedback on assessments is comprehensive and presented within a reasonable timeframe, and that examinations' marked solutions are made available for students, with students' grades posted in a timely manner, allowing enough time for students to seek feedback and clarification as they see fit.

9. Adjust the English language proficiency requirements for admission into the programme to make them more appropriate for a graduate-level qualification.

10. Develop some mechanisms that allow more time for faculty members to engage in scientific research.

11. Raise students' awareness about the career counselling services available at the University and encourage them to make the utmost use of them.

12. Take the necessary steps needed to evaluate the support provided to at-risk students; explore the possibility of developing student progression monitoring via the SIS; and use the information for continuous monitoring of students' performance and for timely interventions.

13. Take the necessary steps needed to formally inform the wider student body about actions/improvements undertaken in the university's support services based on student feedback.

14. Require faculty to consistently and regularly utilize the available plagiarism detection software to check the authenticity of students' submitted works, record all cases of academic misconduct, and take appropriate actions to deter them.

15. Develop a mechanism through which a formal evaluation of the effectiveness of the internal and external moderation process is carried out on a regular basis.

16. Revise the syllabus of the 'IT699-Thesis' course to reflect current implemented practice in relation to progress reports and their consequences.

17. Evaluate the mechanisms used to ensure the consistent implementation of quality assurance-related policies and procedures.

18. Raise awareness about quality assurance policies and procedures and inculcate a quality culture through which the understanding of individuals' roles is enhanced, in order to ensure widespread effectiveness of quality matters.

19. Evaluate the mechanism for monitoring, evaluating, and improving the quality assurance management system and make it more systematic.

20. Work on improving the preparation of evidence for the self-evaluation reports and ensure that the process of follow-up and improvement be systematically implemented and evaluated.

21. Conduct a more comprehensive benchmarking exercise of the programme, covering different aspects and components of the academic and administrative activities and services it provides.

22. Evaluate the mechanism of communicating to stakeholders the changes or decisions made on the basis of their feedback.

23. Review and evaluate the mechanisms used to ensure that the programme meets labour market and societal needs.

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