هيئة جودة التعليم والتدريب
Education & Training Quality Authority
KINGDOM OF BAHRAIN مـمـلـكـة الـبـحـريـن

Directorate of Higher Education Reviews Programme Review Report

University of Bahrain
College of Science
Master of Science in Mathematics
Kingdom of Bahrain

Site Visit Date: 17-19 October 2022

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HA106-C3-R106

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Acronyms

APR	Academic Programme Review
ASER	Annual Self-Evaluation Report
BQA	Education & Training Quality Authority
BSM	Bachelor of Science in Mathematics
CILO	Course Intended Learning Outcome
DHR	Directorate of Higher Education Reviews
HEC	Higher Education Council
HoD	Head of Department
IT	Information Technology
MSM	Master of Science in Mathematics
PAC	Programme Advisory Committee
PEO	Programme Educational Objective
PILO	Programme Intended Learning Outcome
PSC	Postgraduate Studies Committee
QA	Quality Assurance
QAAC	Quality Assurance and Accreditation Centre
QAAEC	Quality Assurance and Accreditation Executive Committee
QAC	Quality Assurance Committee
QAMS	Quality Assurance Management System
QAO	Quality Assurance Office
SAC	Student Advisory Committee
SER	Self-Evaluation Report
SIS	Student Information System
SMs	Supporting Materials
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 the APR Framework at the end of Cycle 1 in accordance with the BQA procedure, the revised APR Framework (Cycle 2) was endorsed as per the Council of Ministers' Resolution No.17 of 2019. Thereof, in the academic year (2019-2020), the DHR commenced its second cycle of programme reviews.

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

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

Standard 1: **The Learning Programme**

Standard 2: **Efficiency of the Programme**

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

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

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

Table 1: Criteria for Judgements

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

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

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

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

II. The Programme's Profile

Institution Name*	University of Bahrain
College/ Department*	College of Science / Department of Mathematics
Programme/ Qualification Title*	Master of Science in Mathematics
Qualification Approval Number	-
NQF Level	-
Validity Period on NQF	-
Number of Units*	36
NQF Credit	-
Programme Aims*	1. Work successfully in a career related to mathematics. 2. Engage in research and lifelong learning in the field of mathematics. 3. Contribute positively to society through responsible, professional, and ethical mathematical practice.
Programme Intended Learning Outcomes*	a) Demonstrate the ability to conduct research independently. b) Acquire deep knowledge of different mathematical disciplines. c) Comprehend high levels of abstraction in pure mathematical concepts d) Apply mathematical skills to model, formulate and solve real-life problems. e) Integrate technology efficiently in mathematical modelling and numerical computations of real-life applications. f) Adapt a wide range of advanced and specialized mathematical techniques necessary for mathematical practice g) Conduct Mathematical proofs h) Engage in mathematical lifelong learning through continuous professional development.

* Mandatory fields

III. Judgement Summary

The Programme's Judgement: Confidence

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

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

IV. Standards and Indicators

Standard 1

The Learning Programme

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

Indicator 1.1: The Academic Planning Framework

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

Judgement: ***Addressed***

- The University of Bahrain (UoB) has a well-documented planning process to ensure that academic programmes are relevant and fit for purpose and comply with existing regulations. The Panel notes that the Department established a committee in January 2021 'to review and develop a newer up-to-date version' of the programme. The Panel also notes that the Department is planning to place the MSM programme on the National Qualifications Framework (NQF) and to comply with the qualification design requirements as well as the related mapping and confirmation processes, as stated in the Improvement Plan of the Self-Evaluation Report (SER).

- Although the Department uses UoB's guidelines and template for identifying and addressing potential risks, the Panel finds that the submitted Risk Register is incomplete and missing essential elements. Furthermore, the Panel notes that the same Risk Register is submitted also as a supporting material for the Bachelor of Science in Mathematics (BSM) programme, and the written potential risks are exact copy of those stated as examples in the University's Academic Risk Management Guide which are general and not related specifically to the quality, delivery, and academic standards of the MSM programme. Thus, the Panel recommends that the College should ensure that the potential risks, especially those related to the quality, delivery, and academic standards of the programme, are regularly and correctly identified, and effectively dealt with.

- The programme/qualification's title is concise and indicative of the qualification's type and content, and overall, it is accurately documented on the certificates and the programme specifications. However, the Panel found typos and mistakes in the programme's title in some of the programme's documents, of which some are posted on

the university website. Thus, the Panel advises that the College should ensure that the programme's title and other information available in the programme's documents are correct and up to date.

- The programme has clear Programme Educational Objectives (PEOs) which were revised lately in May 2022 in consultation with relevant stakeholders, to ensure their contribution to the achievement of missions and strategic goals of the College and the University. The Panel finds that the revised PEOs (aims) are generally appropriate.

Indicator 1.2: Graduate Attributes & Intended Learning Outcomes

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

Judgement: *Partially Addressed*

- UoB has generic graduate attributes defined as the University Intended Learning Outcomes (UILOs) that are embedded within the MSM programme in terms of Programme Intended Learning Outcomes (PILOs) which were revised recently. The Panel is of the view that the PILOs are clearly stated and linked to the PEOs and the UILOs, and generally appropriate for the programme's type and level. However, the Panel notes that leadership and teamwork skills as well as UILO 5 'Responsibility and Integrity' are not appropriately covered by the PILOs. This is also confirmed by the feedback obtained from alumni and employers highlighting the need for teamwork and leadership skills. Moreover, the mappings of the PILOs-UILOs and PILOs-PEOs in the Programme Specification form should be revisited, e.g., the mapping of PILO f to UILO 5 and the mapping of PILO h to PEO 3 are not accurate. Thus, the Panel recommends that the College should revise the mapping of PILOs to UILOs and to PEOs to ensure appropriate coverage of the university graduate attributes and programme objectives. Moreover, to fulfill the request of alumni and employers, the Panel also recommends that the College should incorporate teamwork and leadership-based skills in the learning outcomes at the programme and course levels.

- The Panel notes that the PILOs are measurable and appropriately written and were benchmarked with other similar programmes in international universities. The Panel examined the Course Intended Learning Outcomes (CILOs) written in the provided course syllabi/specifications, and notes that they are generally appropriate for the level of the courses and their contents including the research course MATHS 599. However, the Panel was provided with only 22 (out of 37) course syllabi that follow two different templates and some of which contain errors. The Panel was informed during interviews that the syllabi of the remaining courses are not available yet because they have never

been offered. Thus, the Panel recommends that the College should ensure that the syllabi/specifications of all courses in the programme are available and completed accurately as per NQF requirements, using the university unified template. Also, the Panel recommends that the College should ensure effective implementation of the university procedures for developing, reviewing, and approving the course syllabi/specifications and the Programme Specification Form, to assure accuracy and consistency of implementation.

- The Panel was informed during interviews that the Department did not utilize benchmarking or NQF processes to verify the appropriateness of CILOs. Also, after inspecting the mapping of CILOs-PILOs, the Panel finds that the PILO e is supported only by the CILOs of MATHS 536 which is an elective course, while the PILOs a, f, and h are not supported by any of the taught courses, and the only opportunity left for the student is to learn these PILOs independently during the thesis course MATHS 599. Thus, the Panel recommends that the College should ensure that the PILOs and CILOs meet the NQF requirements and that there is sufficient and appropriate contribution of the CILOs to the attainment of each PILO.

Indicator 1.3: The Curriculum Content

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

Judgement: *Partially Addressed*

- The MSM study plan consists of 36 credit-hours organised over four semesters with a total of five core courses with no prerequisites, five elective courses of which some may have prerequisites, and a six-credit 'Thesis' (MATHS 599) course. The Panel acknowledges that the study plan shows appropriate progression year-on-year and course-by-course in terms of levels and credits, with an appropriate suitable student workload. However, the Panel finds that some of the provided documents do not clearly specify the course prerequisites. Thus, the Panel recommends that the College should ensure that course prerequisites are clearly and consistently defined in all programme description documents, published on the university website, and disseminated to all stakeholders.

- Mechanisms explained in UoB regulations and policies ensure an appropriate balance between theory and practice and between knowledge and skills in the curriculum, and the provided course syllabi and portfolios demonstrate that the course contents cover all elements expected in terms of depth and breadth in main branches of mathematics. Overall, the Panel acknowledges that the curriculum is organised to provide academic

progression of learning complexity and illustrates a balance between knowledge and skills as well as theory and practice.

- The textbooks and references stated in the provided course syllabi are largely current and appropriate with a few exceptions such as the textbook of MATHS 505, which was published in 1970 and the textbook of MATHS 500, which was published in 1976. Evidence of utilization of recent research findings and current professional practice in course materials and teaching/learning activities was noted and confirmed during interviews. The Panel, however, recommends that the College should ensure that current textbooks are used in all offered courses and enhance the utilization of recent research-based references, research findings, and current professional practice in the teaching/learning process.

- There are mechanisms in place to ensure that the intended learning outcomes of the research component are covered and stipulate how these outcomes will be achieved and measured (see Indicator 3.5 for further details). Moreover, the Panel notes that MATHS 599 students are guided and supported by qualified supervisors to complete their research projects successfully. Sufficient evidence shows that students receive training in the principles and ethics of research in their specialization. However, the Panel recommends that the College should incorporate topics (and a course, if possible) on research methods and ethics in the programme, to facilitate the achievement of the learning outcomes of the research component and support the attainment of PILOs a and f, as well as PEO 2.

Indicator 1.4: Teaching and Learning

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

Judgement: ***Addressed***

- There is an institutional teaching and learning policy that refers to the use of a range of appropriate teaching methods, promotes the use of interactive, independent, technology-oriented, and research-informed learning and teaching methods, and encourages students' participation in learning, exposure to professional practice and application of theory, and development of independent and lifelong learning. The policy also supports e-learning, and as confirmed by evidence and interviews, the faculty members use Microsoft Teams and Blackboard as platforms for implementing e-learning efficiently to support the attainment of the learning outcomes.

- The Panel notes that the teaching and learning methods are not stated in the Programme Specification Form. Also, the Panel inspected the teaching and learning methods documented in the weekly schedules in the provided course syllabi/specifications and did

not find any evidence to indicate that the Department uses a variety of teaching and learning methods, as stated in the SER, other than lecturing and problem-solving. Therefore, the Panel recommends that the College should ensure that the teaching/learning and assessment methods employed in the programme are clearly stated in the Programme Specification Form as well as in every course syllabus/specification. Moreover, to comport more with the University Teaching and Learning Policy and to support the attainment of the PILOs a, e, f, and h, as well as PEO 2 (refer to Indicator 1.2 in this regard), the Panel recommends that the College should enhance the student learning process by integrating more independent and group-based research-informed and technology-oriented teaching, learning and assessment methods in the programme. This will also fulfill the recommendation of the surveyed alumni and employers.

- The Panel acknowledges that the learning environment at UoB strengthens the students' perceptions and research capabilities, motivates them to create and innovate, and promotes the concept of lifelong learning by encouraging all types of learning, e.g., by organizing extracurricular activities within the College and Department including seminars, workshops, and the International Day of Mathematics. Evidence, such as the results of senior student exit surveys, shows great students' satisfaction toward the learning environment.

Indicator 1.5: Assessment Arrangements

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

Judgement: ***Addressed***

- The Panel found clear sections on assessment of learning in the University Teaching and Learning Policy and in the University Guidelines for Assuring Learning. The Panel affirms that the University has an assessment framework including policies, procedures, rules, and regulations which are well-documented, appropriate for the type and level of the programme, and implemented strictly and systematically. The Panel recognises that the assessment policies and procedures are generally published on the university website and disseminated to relevant stakeholders. However, the Panel finds that some of the assessment documents are either not available on the UoB website or have broken links, The Panel advises the College to ensure that all assessment regulations/policies/guidelines are made available on the university website to all stakeholders.

- The Panel examined samples of course syllabi/specifications and portfolios and is satisfied that various summative assessments with clear criteria for marking are used, and appropriate mechanisms are employed to provide students with prompt feedback on their progress and performance in the programme. Also, the Panel learned during interviews

that many faculty members use formative assessment in the programme, as stated in the SER, but the Panel did not receive any evidence (even after requesting it) nor find any information written in the provided course syllabi/specifications confirming the use of formative assessments. Thus, the Panel recommends that the College should document the formative assessment clearly in the course syllabi/specifications and show alignment with CILOs. Furthermore, the Department is encouraged to efficiently utilize Blackboard's online assessment capabilities as well as those provided by electronic/smart books to design formative online assessments for learning.

- The Panel notes that the learning needs of students during the research phase of the programme are supported on a regular basis, and their progress is monitored and evaluated (See Indicator 3.5 for further details). As explained in the SER and the course specification of MATHS 599, the ethics and principles of scientific research are considered in the evaluation of the research. There are also transparent mechanisms for grading students' achievements with fairness and rigour, with appropriate provisions for internal and external moderation of assessments (Refer also to Indicator 3.3 for related details regarding implementation). In addition, the regulations for addressing academic misconduct and appeals are well-documented and in place (See Indicator 3.2 for details regarding implementation).

Standard 2

Efficiency of the Programme

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

Indicator 2.1: Admitted Students

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

Judgement: *Partially Addressed*

- The programme has clear admission requirements which are guided by the UoB general admission criteria and published in printed documents and online as well. The Panel notes that admission is mainly based on students' bachelor degree Cumulative Grade Point Average (CGPA), English proficiency certificate, entrance examination and interview scores regardless of the student gender. Moreover, as per the statistics provided in the SER, the Panel found no evidence of unfairness in accepting students into the programme and is of the view that the admission requirements are applied consistently. The Panel also confirms that the admission requirements ensure the enrolment of students who are appropriate for the programme level, and that they are consistent with local and international academic standards. The Panel notes that it is stated in UoB Postgraduate Studies Regulations that the applicant must also submit recommendation letters from two faculty members from the university from which they graduated, but this statement is not included in the College Booklet and programme brochures. Thus, the Panel recommends that the College should ensure that its Booklet and the programme brochures contain the most updated admission criteria for the programme.

- There are clear regulations and procedures for access, progression, as well as internal and external transfer from and to the programme. However, there are no cases of transferring students to the programme yet. The Panel also notes that there are appropriate remedial support measures for inadequately prepared students to enter and progress in the programme. This was also confirmed during the interviews. The introduction of the remedial courses has been listed in the evidence as an example of a revision of the admission requirements. However, the Panel notes that no evidence of a regular revision of the admission policy with consultation of relevant stakeholders was provided. Thus, the Panel recommends that the College should develop a mechanism for regular revision

of the admission policy in light of student performance and feedback from relevant stakeholders, in addition to national and international benchmarks.

Indicator 2.2: Academic Staff

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

Judgement: ***Partially Addressed***

- The University has clear published regulations and procedures for the recruitment, induction, appraisal, and promotion of academic staff, which are consistently implemented in a transparent manner. The Panel notes that induction of new faculty is taking place at both the university and department levels. This was also confirmed during the interviews.

- There are clear policies and procedures to ensure the quality of scientific research carried out by faculty members. The overall implementation of these policies and procedures is supervised and managed by the Deanship of Graduate Studies and Scientific Research. The Panel notes that the process of the approval of research funding requires ensuring the quality of scientific research carried out by faculty members and its alignment with the research plan of the College and the Institution. The Panel acknowledges that the quality of scientific research carried out by faculty members is demonstrated through research publications in indexed journals with high SJR and impact factors and through successful promotion attempts. The Panel also appreciates the Department for its effort to organize an international conference on Emerging Trends in Pure and Applied Mathematics in 2021.

- In the SER, it is stated that the teaching load assigned to each faulty member is four sections (12 contact hours) per semester. However, the Panel notes that the teaching load of some faculty members exceeds 10 courses during the whole academic year. This issue of high teaching load was confirmed during the interviews and had been reported by the Department in the annual reports since the academic year 2018-2019. The Panel understands that the Department is heavily involved in teaching service courses, and it is in the process of hiring new faculty members. Excluding service courses, the Panel confirms that there are sufficient staff members with an appropriate range of academic qualifications, specializations, and professional experience to teach on the programme. However, the Panel recommends that the College should speed up the process of hiring new faculty to reduce the workload of faculty as well as the high student- to-faculty ratio.

- The Panel notes that the special needs of women are considered in the University bylaws and regulations which are in line with international practices and consistently

implemented. By examining the provided evidence, the Panel confirms that there are suitable and effective arrangements/policies/procedures for identifying and supporting continuing professional development needs of all staff, which are consistently monitored and evaluated.

- Monitoring and evaluation of in-house professional development activities have been confirmed during interviews. The Panel appreciates the University for promoting continuous professional development through the Unit of Teaching Excellence and Leadership, E-learning Centre, and the Quality Assurance and Accreditation Centre (QAAC) and encouraging faculty members to obtain professional certificates. However, the Panel finds no evidence that the University/College provides opportunities to develop faculty members' capacity for supervising research theses through professional development programmes. Thus, the Panel recommends that the College should develop and implement a mechanism to provide opportunities to develop faculty capacity for supervising research theses through professional development programmes. During the interviews, the Panel also learned that staff turnover is monitored, and retention of highly qualified academic staff members is ensured by the support UoB provides to the faculty through professional development arrangements, appraisal, and research funds and incentives.

Indicator 2.3: Physical and Material Resources

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

Judgement: ***Addressed***

- Classes and laboratories are adequate in terms of number and size for the available students and are appropriately equipped. The Information Technology (IT) facilities are also adequate for students' needs. However, the Panel notes that there is no laboratory assistant in the Department and thus, the Panel recommends that the College should appoint a laboratory assistant for the department's computer laboratories to provide technical support to staff and students.

- The programme, together with other programmes at the College of Science, are supported by the Science & IT Library which has adequate (hard and electronic) resources for the programme needs and encompasses appropriate formal and informal study spaces, photocopying and printing services, and public-access computers and Internet. All the above was also confirmed through the Campus Tour conducted as a part of the review. Overall, the Panel acknowledges that the available infrastructure and physical resources are sufficient for efficiently running the programme.

- The Panel learned during interviews that all computing services are managed and maintained by the IT Centre *via* an internal online help-desk system. This includes maintenance of software, laboratory resources, network, internet connectivity and any technical support. However, the Panel notes that the personal computers in the department's laboratories date back to 2015. The Panel also learned that the senior student exit survey has been utilized to evaluate the adequacy of resources, which is indeed found to be not enough. Thus, the Panel recommends that the College should ensure that there is a systematic mechanism for regular maintenance of the department's computer laboratories and for measuring their adequacy.

- There are appropriate arrangements to ensure the health and safety of students and staff on campus, which are stated in the Occupational Health and Safety Programme. The visibility of health and safety signs as well as related instructions was also confirmed during the Campus Tour

Indicator 2.4: Management Information Systems

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

Judgement: ***Addressed***

- UoB employs a Student Information System (SIS) to record and manage information regarding students' admission, registration progression, and graduation, as well as course evaluation, approval of grades, grade appeals, academic advising, and Quality Assurance (QA) related data analysis reports. The system is used effectively by students, faculty members, and administrators to enable informed decision-making. Overall, the Panel acknowledges that the SIS is appropriate and provides a database for the programme's needs, which enables informed decision-making.

- The Panel received samples of generated tracking reports of the utilizations of e-learning. However, no tracking reports for the utilization of computer laboratories were received. During the interviews, it was reported that such reports are generated only occasionally if an incident is taking place. Thus, the Panel recommends that the College should develop and implement a mechanism to keep track of the utilization of computer laboratories to be used to inform the decision-making process.

- There are policies and procedures in place to ensure the security of learners' records and accuracy of results such as several access authentications, and access control to ensure the integrity, confidentiality, and protection of data. The Panel notes there is an IT risk management plan which includes regular backup on different servers on and off campus.

The Panel also notes that the awarded certificates and transcripts are accurate in describing the achieved learning by students and are issued 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.

Judgement: ***Addressed***

- There is appropriate student support in terms of library, e-learning and e-resources, guidance and care and arrangements are in place for inducting newly admitted students at the university and department levels. Induction and student support services were also confirmed during the interviews.

- As per the SER, academic advising supports students in achieving graduate attributes and learning outcomes. With the support of the SIS, academic advisors can monitor the progress of the students and provide them with necessary advice to improve their performance. A demonstration of academic advising through the SIS was provided to the Panel through the virtual site visit. The Panel notes that only a few advising comments were entered in the system. Hence, the Panel advises the College to encourage academic advisors to keep detailed records of their advising in the SIS. Although, it is not explicitly stated in the SER, the Panel recognises that UoB provides career guidance services and support to its students to help them prepare for work and plan their career paths.

- The Panel notes that support is maintained for both genders and no evidence of discrimination between male and female students was observed and that there are appropriate provisions to ensure the support of students with special needs. The Panel also notes that students at risk/on probation can be easily identified through the SIS and appropriate actions can be taken in a timely manner. Moreover, the Panel notes that the provided support services are regularly assessed through the senior student exit survey and improved in line with students' needs. This was especially clear during Covid-19 pandemic. Overall, the Panel acknowledges the University for the appropriate support and services provided to its students.

Standard 3

Academic Standards of Students and Graduates

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

Indicator 3.1: Efficiency of the Assessment

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

Judgement: ***Addressed***

- UoB has well-defined assessment regulations and procedures stipulated in a number of documents. The assessment arrangements in the programme are in line with these regulations and procedures. The Panel notes that the assessment methods are clearly stated in the provided course syllabi and were reported on during the interviews. These include quizzes, tests, assignments, projects, oral presentations, and case studies. By examining samples of the provided assessments in the course portfolios, the Panel confirms that these methods are in line with current good practices, in terms of the level of assessments' complexity, and meet the academic standards of the programme.

- The Department aligns assessments with CILOs, PILOs, and graduate attributes by mapping the assessments to the CILOs, which are in turn mapped to PILOs. However, the Panel finds that the mappings of assessments to CILOs are not always included in the course syllabi/specifications, e.g., the course syllabus of MATHS 581 is missing such mapping. The achievements of CILOs, and hence PILOs, are measured using excel sheets designed for this purpose, and improvement plans are designed whenever there are unachieved CILOs. The Panel examined samples of the excel sheets for the courses MATHS 500, MATHS 521, and MATHS 563, which show achievement of all corresponding CILOs and the PILOs to which they contribute. However, the Panel notes that the CILO-PILO mapping for the course MATHS 563 presented in the corresponding excel sheets is inconsistent with the mapping presented in its course syllabus, and CILO 2 in the course syllabus of MATHS 500 is not included in the corresponding Course Assessment Excel Sheet, which raise a concern about the accuracy of the Annual PILOs Assessment Reports prepared by the Department. Thus, the Panel recommends that the College should ensure consistent CILO-PILO mappings in the course syllabi and the

Course Assessment Reports and Excel Sheets. It was noted that Graduates' achievements are also assessed through the analysis of the Senior Exit, Alumni, and employer surveys.

- The Department employs moderation of assessments and reviews course portfolios to improve the assessment process and ensure its proper implementation. Internal and external moderation of assessments aim to ensure consistency, fairness, and appropriate alignment of assessments with learning outcomes. The course portfolios, which should include all course assessments, are reviewed by the Department Quality Assurance Committee (QAC) to ensure consistency and quality of assessment. Based on this review, a report and an improvement plan are produced.

Indicator 3.2: Academic Integrity

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

Judgement: ***Addressed***

- The policies and procedures related to academic integrity are published on the UoB website and adopted by the Department of Mathematics. As confirmed during the interviews, faculty members and students are informed about the academic integrity regulations during their induction sessions. As per the action plan stated in SER, the Department included a reference to the policies and procedures related to academic integrity in the revised course syllabi that were made available to the Panel during the Extension Visit. Overall, the Panel notes that the University has well-documented academic integrity related policies and procedures, including those related to ethics and research.

- The Panel notes that the Avoiding Plagiarism Policy addresses the three aspects of prevention, detecting and penalties of plagiarism and academic misconduct. Detection tools such as Turnitin and SafeAssign are adopted to detect plagiarism in written submitted assignments, projects, and theses. The Panel notes that the university's regulations do not define any fixed acceptable percentage of similarity identified by these tools. However, based on the documents that were made available to the Panel during the Site Visit and the Extension Visit, the Panel noted that the maximum accepted similarity is 25% and the reports generated by the plagiarism detection tools are used by instructors, thesis supervisors and the Postgraduate Studies Committee (PSC) at the department level to examine the similarity content to ensure that the submitted assignments and thesis are plagiarism free. This has also been confirmed during the interviews. However, the Panel notes that the PSC minutes does not include any statement showing that the PSC has examined the similarity content of the Master thesis. Therefore, the Panel suggests that the PSC documents all the actions taken to examine the similarity content of the Master thesis.

- The Panel notes that the Department of Mathematics adopts strict invigilation procedures to deter and detect cheating in examinations for both on-campus and online examinations using Lockdown Browser, online proctoring platform and Responds. These practices were confirmed during interviews. Cases of plagiarism or cheating during examinations are referred to the Student Misconduct Committee at the college level along with written reports and supporting documents for further investigation. The Panel learned during interviews that there are no reported cases of academic misconduct or plagiarism in the programme.

Indicator 3.3: Internal and External Moderation of Assessment

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

Judgement: ***Partially Addressed***

- There are formal and appropriate procedures for internal pre- and post-moderation of assessment in the programme which are conducted based on a course rolling plan. The internal moderator is selected by the Moderation Committee based on his/her experience with the moderated course. During pre-moderation, the moderator reviews the assessment items to ensure appropriateness, fairness, and alignment with CILOs and writes recommendations for improvements if needed. The post-moderation follows after the assessment has been conducted to ensure consistency of grading with the marking scheme. Samples of internal pre-moderation and post-moderation forms were made available to the Panel during the Site Visit. During the interviews, the Panel confirmed that both instructors and moderators are satisfied with the internal moderation process and that the internal moderation has contributed to the review and improvement of the moderated courses.

- Similarly, there are formal and appropriate procedures for external moderation. The external moderation is conducted based on the course rolling plan, and the external moderator is expected to review all issues related to the course assessment including the appropriateness of the CILOs. Samples of external moderation were provided for MATHS 500 and for MATHS 521. During the Site Visit, the Panel noted that the Assessment Moderation Regulation included general selection criteria of external moderators, but it did not specify the rules and procedures for selecting, nominating, and appointing the external moderator. However, the Panel noted that a new article addressing the rules and procedures for the appointment of the external moderator has been included in the Assessment Moderation Policy, after the Site Visit. During the Extension Visit, the Panel was also provided with the external moderation rolling plans for the academic years 2023-2024 and 2024-2025, which include all the programme's major courses and have been approved by the Department Council.

- To evaluate the effectiveness of the internal and external moderation, the Moderation Committee analyses the moderation activities and submits a moderation analysis report along with an improvement plan when needed. However, the Panel noted that the latest submitted moderation report was for the first semester of the academic year 2021-2022 and the external moderation of the MSM courses was not implemented before the second semester of that year. The Panel did not receive any valid justification when it inquired during the interviews about the late implementation of the moderation procedures in the programme, even though the Moderation of Assessment Regulations were approved in 2015 and updated in 2018. Thus, the Panel recommends that the College should ensure full adherence to the University Moderation of Assessment Regulations regarding the external moderation of all the programme's major courses at least once within the duration of the programme.

Indicator 3.4: Work-based Learning

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

Judgement: *N/A*

Indicator 3.5: Capstone Project or Thesis/Dissertation Component

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

Judgement: *Addressed*

- The Panel notes that the six-credit thesis course MATHS 599 contributes to the achievement of all PILOs, as is reflected in the CILOs-PILOs mapping, where the student is expected to work under the supervision of a faculty member on a research topic. The roles and responsibilities of the supervisors and students are clearly stated in the Graduate Studies Regulations and communicated to the relevant stakeholders. The Panel also notes that guidelines for writing the thesis are also provided to students. This was also confirmed during the interviews.

- After examining the provided evidence, the Panel confirms that the progress of students during the thesis course is regularly monitored and reviewed by the supervisor who writes progress reports using a special form at the end of every semester, to measure the progress of their postgraduate students. The progress report is submitted for approval to

the Department, College, and the Deanship of Graduate Studies and Scientific Research, and an appropriate grade of satisfactory or unsatisfactory progress is assigned accordingly. The Panel, however, suggests storing these supervision reports electronically (e.g., *via* the SIS) to allow easy search/retrieve and generation of summarized reports regarding the effectiveness of supervisions. Students expressed, during the interviews, their satisfaction with the supervision process and the resources available to carry out their research and they stressed that any issues related to supervision or required resources are reported directly to the Head of Department (HoD).

- During the Site Visit, the Panel noted that students' satisfaction with the supervision process was not systematically solicited during and at the end of the thesis course. However, this issue was resolved and during the Extension Visit, the evidence that was made available to the Panel confirms that students' satisfaction with supervision and available resources is currently monitored by surveys, interviews and through meetings with PSC. This has been also confirmed during the interviews.

- There are rigorously implemented procedures for the assessment of the thesis which are clearly explained in the Graduate Studies Regulations with well-defined responsibilities, starting from the nomination of the thesis examination committee to the thesis defense and the approval of the committee's decision. The thesis examination committee, which consists of the supervisor, an internal examiner, and an external examiner, evaluates the thesis using well-defined rubrics and special forms with mark distribution covering the written report (70%) and the oral defense (30%).

- The Panel notes that the PSCs at university, college, and department levels manage and monitor the thesis related procedures, ensure consistent implementation, and propose improvements when necessary. The Panel, however, suggests that the QAC and the external moderator should also review and assess samples of theses to further assure consistency and quality of assessment and achievements. Overall, the Panel acknowledges that there are clear policies and procedures for the supervision and evaluation of the master thesis, which state the responsibilities and duties of both the supervisors and students.

Indicator 3.6: Achievements of the Graduates

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

Judgement: ***Partially Addressed***

- As stated in Indicator 3.1, the Panel acknowledges that the Department uses a variety of assessment methods that are aligned to measure the achievements of CILOs. The CILOs

are mapped to the PILOs which are in turn mapped to the PEOs. The Panel confirms that the students' assessed work at different levels and courses is subjected to careful scrutiny through moderation and external examination including the master thesis. The provided summary reports for the assessment of PILOs indicate, in general, high achievements of PILOs which means that the graduates have the necessary attributes to enable them to achieve the PEOs and reflect their ability to create and innovate. Therefore, the Panel acknowledges that the level of students' achievements is appropriate based on careful scrutiny of students' assessed work.

- The Panel studied the statistical data regarding the ratios of admitted students to successful graduates provided in Table 3.6-1 of the SER for the last five academic years, and notes that students are taking a bit longer time to graduate than expected. However, it is stated in the SER that most students are employed and tend to delay the registration of the thesis. The Panel also notes that the only data presented about student progression is the presented in Table 3.6-1 During the Site Visit, the Panel noted that comprehensive and regular cohort analysis is not conducted, and it is not clear how the Department benefits from the data collected *via* surveys to ensure that academic standards are met. Thus, the Panel recommends that the Department should regularly conduct comprehensive cohort analysis and ensure that student progression and graduate destinations data are properly used to ensure that academic standards are met. The evidence that was made available to the Panel during the Extension Visit, confirms that the Department is planning to take the necessary actions to address the above-mentioned recommendation.

- UoB uses alumni and employer surveys to assess the satisfaction of graduates and employers with the graduates' profile. However, the Panel notes that the employer's response rate for a survey conducted in the academic year 2021-2022 was very low (only 3 out of 46). Hence, the Department needs to encourage more participation in order to draw more reliable conclusions. The alumni's response rate, on the other hand, is reasonable (10 out 13). The Panel notes that, in general, the graduate responses show a high level of satisfaction, except for a few things that need to be addressed and improved. During the interviews, the Panel learned that a significant number of graduates of the programme have pursued and successfully gained PhD qualifications from reputed international universities in different branches of mathematics.

Standard 4

Effectiveness of Quality Management and Assurance

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

Indicator 4.1: Quality Assurance Management

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

Judgement: ***Addressed***

- UoB has appropriate documented policies, processes, and regulations for the needs of the programme which are communicated to all relevant stakeholders *via* the university website and as printed and distributed documents, as confirmed during interviews. During the Site Visit, the Panel noted that some of the policies and procedures were reviewed and revised, however, regular revision for some policies was not established. For example, it was noted that the Programme Quality Assurance and Enhancement Policy has not been reviewed since its approval in 2015, although the policy clearly states that it should be 'reviewed and revised as necessary every 3 years or more frequently as laws or regulations change.' Thus, the Panel recommends that the College should ensure that regular revisions of university policies and regulations are taking place.

- The Panel finds that the University has a clear Quality Assurance Management System (QAMS) in relation to the programme, which functions at different levels. The University Quality Assurance and Accreditation Executive Committee (QAAEC) and the QAAC in collaboration with the College Quality Assurance Office (QAO) and the Departmental Council and the QAC manage, monitor, and ensure consistent implementation of all QA-related policies and procedures as scheduled in the Departmental QA-Operational Plan. During the Site visit, the Panel was informed that the College of Science is seeking to adopt the electronic system ACADEM to help collect information and generate reports about the efficiency of the QAMS.

- The Panel notes that academic and support staff understand QA and their role in ensuring effectiveness of provision, as demonstrated in interviews. Faculty members participate in the implementation of QA policies and procedures, as shown in the provided evidence. Evidence also shows that the College QAO provides QA capacity building and training workshops for academic and administrative members. Moreover, the PSCs at the university, college, and department levels play important roles in monitoring and ensuring consistent implementation of the UoB Postgraduate Studies Regulations.

Indicator 4.2: Programme Management and Leadership

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

Judgement: ***Addressed***

- The organizational structure of the College is appropriate for the management of the programme. The leadership and management of the programme includes the Dean of the College, the Director of QAO, the HoD, and the Programme Coordinator. The SER states that the 'College Council is chaired by the Dean of the College and includes in its membership the HoDs, senior faculty members representing each Department, and external members.' However, the Panel notes that the current College Council does not have any representative from the Departments of Mathematics, Biology, and Physics beside the HoDs, which does not comply with the University Bylaws. During the Extension Visit, the Panel received evidence indicating that this issue was resolved and that the Department of Mathematics now has a representative faculty member in the College Council.

- The existing reporting lines are clear and ensure effective communication and decision-making. The HoD reports to the Dean of the College, oversees both the operational and strategic aspects of the programme, and manages the programme with the help of the Departmental Council and committees, including the PSC which is chaired by the Programme Coordinator. Every department committee is chaired by a faculty member who reports directly to the HoD.

- The terms of reference for different key management posts and committees are clearly described in university documents. These documents in addition to many of the university policies and regulations also explain where the academic responsibility and the custodianship of the academic standards of the programme rest at the department, college, and institution levels. In particular, the Panel notes that the PSC at the department level has an important role in reviewing and improving the programme's curriculum and ensuring its academic standards as explained in multiple documents. However, during the Site Visit, the Panel learned through the interviews that the PSC did not participate in identifying the potential risks for the programme, preparing the benchmarking study of the programme, revising the PEOs and PILOs, nor ensuring the accuracy of course and programme specifications. During the Extension Visit, the Panel was provided with evidence indicating that the roles and responsibilities of the PSC have been revised and enhanced to include the above-mentioned tasks.

Indicator 4.3: Annual and Periodic Review of the Programme

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

Judgement: ***Partially Addressed***

- Examined evidence shows that the Department consistently implements the QAAC Annual Programme Self-Evaluation Process, where at the end of each academic year, an Annual Self-Evaluation Report (ASER) is prepared by the QAC and submitted to the Department Council for further study and actions. The Panel notes that the ASER measures the programme's performance toward achieving its PEOs and PILOs using data collected from course assessment reports prepared by instructors at the end of every semester. The ASER also considers data and information on faculty members, students, research achievements, and satisfaction of stakeholders and concludes with some recommended improvements. Thus, the Panel is satisfied that there are appropriate arrangements at the department level for an annual internal programme evaluation that results in a comprehensive report including recommendations for improvement.

- As per the SER, the HoD, QAC, QAO, and QAAC monitor the implementation of the recommended improvements. However, the Panel noted that some of the provided ASERs are incomplete and need to be improved. For example, the Panel found Section 7 of the ASER, which is supposed to summarize the solicited feedback, recommendations, and actions taken by the Department, totally empty in some of the examined ASERs, and Section 8 contains almost the same list of improvements in all years without showing the status or progress of achievement. During the Extension Visit, the Panel was provided with the latest ASER for the MSM programme and found it more comprehensive and included the planned actions for improvements with well-defined responsibilities and timelines. Nevertheless, the Panel recommends that the College should ensure that all the ASERs are complete and comprehensive, and that the progress achieved in addressing the recommended improvements is recorded in the ASERs to facilitate monitoring and evaluation.

- The University has a policy for the periodic review of the programme explained in the Programme Quality Assurance and Enhancement Policy and the Regulations for Offering and Developing Academic Programmes and Courses at the UoB. The policy that was made available to the Panel during the Site visit, is comprehensive and includes a detailed process for regularly and periodically reviewing the programme, at least once every five years, and considers benchmarking and market needs studies, feedback of stakeholders, and requirements of QA and accreditation.

- During the Site Visit, the Panel learned from interviews that the Department did not implement the periodic review process for the MSM programme since 2009 when the current study plan of the MSM programme was proposed and the Panel noted that there was an attempt to implement the periodic review process but it was incomplete and incomprehensive as confirmed during interviews. During the Extension Visit, the Panel noted that the Department planned to conduct a comprehensive review of the MSM programme in the first semester of the academic 2025-2026. Therefore, the Panel recommends that the College should conduct a comprehensive periodic review of the programme, at least once every five years, considering the outcomes of benchmarking and market needs studies, and stakeholders' feedback.

Indicator 4.4: Benchmarking and Surveys

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

Judgement: ***Addressed***

- The Panel notes that benchmarks and reference points are used to compare the programme's academic standards with other similar programmes. In line with the University Benchmarking Policy, the Department conducted a recent benchmarking study in 2022 against similar programmes chosen from American and regional universities, since the programme is only offered by UoB in Bahrain. The study covers the structure of the curriculum; mainly, the number and type of courses, and frequency of the courses in the benchmarked universities. A different study against four universities was also conducted for comparing the PILOs. However, the Panel is of the view that the benchmarking studies should include the CILOs, learning resources, and the teaching, learning and assessment methods. Thus, the Panel recommends that the College should ensure that the benchmarking studies are comprehensive and cover all aspects of the learning programme.

- The Panel acknowledges that there are formal mechanisms for collecting structured comments from all stakeholders. The Department regularly solicits feedback from relevant stakeholders for the purpose of improving the programme. Feedback from students is collected through the course evaluation forms and the senior student exit surveys semesterly and *via* meetings with the Student Advisory Committee (SAC) once a year; although the Panel advises that the SAC should meet at least twice a year. Moreover, the Department periodically runs alumni and employer surveys every two years and collects feedback from the Programme Advisory Committee (PAC) once a year. Moreover, the Panel found sufficient evidence that the collected comments are analysed and used to inform decisions on the programme. The Department analyses the results of all surveys,

discusses the results in departmental meetings, and develops improvement action plans accordingly. The HoD, QAO, and QAAC follow up and monitor the implementation of these improvements. Moreover, the Panel noted that the implemented changes are also communicated to stakeholders who are satisfied with the changes implemented based on their feedback, as confirmed during interviews.

Indicator 4.5: Relevance to Labour Market and Societal Needs

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

Judgement: ***Partially Addressed***

- The Panel is satisfied that the PAC has clear terms of reference and includes alumni and employers from public and private sectors. The PAC is chaired by the HoD, meets once a year as per the Departmental QA Operational Plan, and its feedback is used to inform decision-making on the MSM programme. However, the Panel suggests adding more members to the PAC who are experts and fully aware of the new trends in the field. The Panel also suggests that the PAC members meet at least twice a year.

- During the Site Visit, the Panel was not provided with convincing evidence that the programme meets the labour market, national, and societal needs. Instead, the Department provided the same market studies used for the BSM programme. The Panel notes that there are planned actions to develop a market feasibility study for the MSM programme, as seen in the SER Improvement Plan. During the Extension Visit, the Panel was informed that the Department has reviewed a number of market studies conducted by local and international organizations such as the report on "The Future of Jobs and Skills in the Middle East and North Africa" and "Tamkeen-Future Skills Report". However, the Department did not provide sufficient evidence to show these studies have been utilized in improving the programme. Therefore, to ensure that the MSM programme is relevant, up-to-date, and meets the labour market and societal needs, the Panel recommends that the College should develop formal mechanisms to scope the labour market and the national and societal needs and utilize the data and information available in the related published studies to identify the future skill gaps and inform decision making on the programme.

V. Conclusion

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

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

1. The effort in organizing an international conference on Emerging Trends in Pure and Applied Mathematics in 2021.
2. The continuous professional development through the Unit of Teaching Excellence and Leadership, E-learning Centre, and Quality Assurance and Accreditation Centre and encouraging faculty members to obtain professional certificates.

In terms of improvement, the Panel recommends that the University of Bahrain and/ or the College of Science should:

1. Ensure that the potential risks, especially those related to the quality, delivery, and academic standards of the programme, are regularly and correctly identified, and effectively dealt with.
2. Revise the mapping of Programme Intended Learning Outcomes to University Intended Learning Outcomes and to Programme Educational Objectives to ensure appropriate coverage of the university graduate attributes and programme objectives.
3. Incorporate teamwork and leadership-based skills in the learning outcomes at the programme and course levels.
4. Ensure that the syllabi/specifications of all courses in the programme are available and completed accurately as per NQF requirements, using the university unified template.
5. Ensure effective implementation of the university procedures for developing, reviewing, and approving the course syllabi/specifications and the Programme Specification Form, to assure accuracy and consistency of implementation.
6. Ensure that the Programme Intended Learning Outcomes and Course Intended Learning Outcomes meet the National Qualifications Framework requirements and

that there is sufficient and appropriate contribution of the Course Intended Learning Outcomes to the attainment of each Programme Intended Learning Outcomes.

7. Ensure that course prerequisites are clearly and consistently defined in all programme description documents, published on the university website, and disseminated to all stakeholders.
8. Ensure that current textbooks are used in all offered courses and enhance the utilization of recent research-based references, research findings, and current professional practice in the teaching/learning process.
9. Incorporate topics (and a course, if possible) on research methods and ethics in the programme, to facilitate the achievement of the learning outcomes of the research component and support the attainment of Programme Intended Learning Outcomes a and f, as well as Programme Educational Objective 2.
10. Ensure that the teaching/learning and assessment methods employed in the programme are clearly stated in the Programme Specification Form as well as in every course syllabus/specification.
11. Enhance the student learning process by integrating more independent and group-based research-informed and technology-oriented teaching, learning and assessment methods in the programme.
12. Document the formative assessments clearly in the course syllabi/specifications and show alignment with Course Intended Learning Outcomes.
13. Ensure that the College Booklet and the university website contain the most updated admission criteria for the programme.
14. Develop a mechanism for regular revision of the admission policy in light of student performance and feedback from relevant stakeholders, in addition to national and international benchmarks.
15. Speed up the process of hiring new faculty to reduce the workload of faculty as well as the student-to-faculty ratio.
16. Develop and implement a mechanism to provide opportunities to develop faculty capacity for supervising research theses through professional development programmes.
17. Appoint a laboratory assistant for the department computer laboratories to provide technical support to staff and students.
18. Ensure there is a systematic mechanism for regular maintenance of the department's computer laboratories and for measuring their adequacy.
19. Develop and implement a mechanism to keep track of the utilization of computer laboratories to be used to inform the decision-making process.

20. Ensure consistent Course Intended Learning Outcomes - Programme Intended Learning Outcomes mappings in the course syllabi and the Course Assessment Reports and Excel Sheets.
21. Ensure full adherence to the University Moderation of Assessment Regulations regarding the external moderation of all the programme's major courses at least once within the duration of the programme.
22. Regularly conduct comprehensive cohort analysis and ensure that student progression and graduate destinations data are properly used to ensure that academic standards are met.
23. Ensure that regular revisions of university policies and regulations are taking place.
24. Ensure that all the Annual Self Evaluation Reports are complete and comprehensive, and that the progress achieved in addressing the recommended improvements is recorded in the Annual Self Evaluation Reports to facilitate monitoring and evaluation.
25. Conduct a comprehensive periodic review of the programme, at least once every five years, considering the outcomes of benchmarking and market needs studies, and stakeholders' feedback.
26. Ensure that the benchmarking studies are comprehensive and cover all aspects of the learning programme.
27. Develop formal mechanisms to scope the labour market and the national and societal needs and utilize the data and information available in the related published studies to identify the future skill gaps and inform decision making on the programme.