



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

Directorate of Higher Education Reviews Programme Review Report

University of Bahrain
College of Engineering
Bachelor of Science in Mechanical Engineering
Kingdom of Bahrain

Site Visit Date: 13-15 March 2023

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Table of Contents

Acronyms.....	3
I. Introduction.....	4
II. The Programme’s Profile	6
III. Judgment Summary	8
IV. Standards and Indicators.....	10
Standard 1.....	10
Standard 2.....	15
Standard 3.....	20
Standard 4.....	25
V. Conclusion.....	30

Acronyms

ABET	Accreditation Board for Engineering and Technology
BQA	Education & Training Quality Authority
CGPA	Cumulative Grade Point Average
CILOs	Course Intended Learning Outcomes
DHR	Directorate of Higher Education Reviews
HEC	Higher Education Council
HoD	Head of Department
MEN	Mechanical Engineering
NQF	National Qualifications Framework
PAC	Programme Advisory Committee
PEO	Programme Educational Objective
PILO	Programme Intended Learning Outcome
QA	Quality Assurance
QAC	Quality Assurance Committee
QAO	Quality Assurance Office
QM	Quality Manual
SAC	Students Advisory Committee
SER	Self-evaluation Report
SIS	Student Information System
ToR	Terms of Reference
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 judgments on the indicators, the Panel additionally determines whether each of the four standards is 'Satisfied' or 'Not Satisfied', thus leading to the Programme's overall judgment, as shown in Table 1 below.

Table 1: Criteria for Judgements

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

The APR Review Report begins with providing the profile of the Programme under review, followed by a brief outline of the judgment received for each 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 Engineering/ Mechanical Engineering Department
Programme/ Qualification Title*	Bachelor of Science in Mechanical Engineering
Qualification Approval Number	University Council Decision No. (454) of 2008 University Council Decision No. (374) of 2022
NQF Level	8
Validity Period on NQF	5 years from the placement date
Number of Units*	49
NQF Credit	604
Programme Aims*	<ol style="list-style-type: none"> 1. Successfully engage in productive careers in a broad range of the mechanical engineering profession in both public and private sectors, including, but not limited to, oil, gas and processing industries, power and water desalination plants, aluminum production and processing industries, and building services. 2. Successfully engage in ongoing professional development activities by pursuing graduate studies and/or other learning opportunities. 3. Advance in responsibility and leadership in their careers and contribute to the well-being of society and environment.

<p>Programme Intended Learning Outcomes*</p>	<ol style="list-style-type: none"> 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. 2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. 3. An ability to communicate effectively with a range of audiences. 4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. 5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. 6. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions. 7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
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* Mandatory fields

III. Judgment Summary

The Programme's Judgment: 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	Addressed
Indicator 1.3	The Curriculum Content	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	Partially addressed
Indicator 2.3	Physical and Material Resources	Partially addressed
Indicator 2.4	Management Information Systems	Addressed
Indicator 2.5	Student Support	Addressed
Standard 3	Academic Standards of Students and Graduates	Satisfied
Indicator 3.1	Efficiency of the Assessment	Addressed
Indicator 3.2	Academic Integrity	Addressed
Indicator 3.3	Internal and External Moderation of Assessment	Addressed
Indicator 3.4	Work-based Learning	Addressed

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

IV. Standards and Indicators

Standard 1

The Learning Programme

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

Indicator 1.1: The Academic Planning Framework

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

Judgment: Addressed

- The BSc in Mechanical Engineering (MEN) programme has been offered by the College Engineering of the University of Bahrain (UoB) since its establishment in 1986. As per the Self-evaluation Report (SER) and the provided evidence, the MEN programme has been regularly revised and updated in line with UoB policies and regulations to ensure that it 'equips its graduates to become intellectual leaders in industry, government, and academia while keeping up with the most recent relevant technology and market demands'. The MEN programme has also been accredited by the Accreditation Board for Engineering and Technology (ABET) since 2008 and was reaccredited in a recent visit by ABET in 2020. The Panel is of the view that the programme is fit for purpose and aligned with the local and international standards and practices.
- UoB has clear risk management processes. The provided evidence includes a sample of risk management plans and a document entitled 'Academic Risk Management Guide for Programs', which provides clear guidelines related to risk identification, assessment, mitigation, and monitoring at the programme level.
- The programme's title is concise and clearly addresses the qualification type, level and contents. This is reflected in all the relating documents such as the programme's specifications, transcripts and certificates. The programme also adheres to the qualification design requirements of the National Qualifications Framework (NQF). Each course has a mapping score card showing the alignment of its leaning outcomes with teaching, learning and assessment methods. The programme is placed on NQF Level 8 and was validated in 2020.

- The MEN programme has clear and appropriate Programme Educational Objectives (PEOs) that are regularly revised in line with the requirements of UoB and ABET. The Panel is of the view that the PEOs are aligned with the mission and goals of the College of Engineering, which contribute to the achievement of the UoB mission and its strategic goals by covering a variety of MEN subjects to increase the graduates' chances of getting suitable jobs in this field.

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: Addressed

- The MEN PEOs and Programme Intended Learning Outcomes (PILOs) are aligned with the University Intended Learning Outcomes (UILOs), which specify the graduate attributes at the institutional level. The PEOs include both technical and soft skills necessary for the engineering profession. The Panel notes that the PILOs include a wide range of graduate attributes such as the ability to communicate with audience, apply new knowledge, apply engineering design, and produce solutions. These attributes are in line with the market requirements for this specific engineering profession.
- The PILOs are clearly stated in the Program Specification document and meet the NQF requirements. They combine technical, analytical, soft and employability skills that are required for the graduates. As per the SER, these PILOs were benchmarked and developed based on the ABET criteria as well as the institution's policies and processes. The Panel is of the view that the PILOs are appropriate for the programme type and level.
- All the Course Intended learning Outcomes (CILOs) are well written, measurable and appropriate for the level of the courses, as is confirmed by the mapping score cards for every course as well as the minutes of meetings of the programme's Mapping and Confirmation Panels. The CILOs are also appropriately linked and mapped to the PILOs as well as the topics and contents of each course.

Indicator 1.3: The Curriculum Content

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

Judgment: Addressed

- The MEN programme is offered in four years (eight semesters) and it comprises 139 credit hours (604 NQF credits). Student workload and course pre-requisites are appropriate for the programme type and level. It includes a combination of compulsory common college courses, compulsory MEN courses, and electives and industrial placement courses. The Panel notes the continuous constructive work of the MEN Department in the development of the curriculum and the variety of engineering courses that are offered to the students, ensuring their specialization in various subject areas related to the industry requirements and market needs. There is evidence for the ABET accreditation, consultation with the relevant stakeholders, and benchmarks conducted by the Department.
- The Panel notes 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 course contents cover the expected elements in terms of depth and breadth. The first year of study consists of mandatory courses, such as Chemistry, workshop practices, graphics, Mathematics, programming and English. This year provides sufficient preparation for the students to take more specialized courses in the subsequent semesters. The students are introduced to advanced Mathematics, Thermodynamic and Material science topics in the 3rd semester, while courses like 'Applied Thermodynamics' (MENG235), 'Numerical Analysis' (MENG274) and 'Junior Project' (MENG290) are offered in the 4th semester, which prepare the students for real-life solutions and management skills at a basic level. The programme continues in the following semesters with more specialized courses such as 'Design of Mechanical Elements' (MENG375), 'Measurement and Instrumentation' (MENG381) and 'Systems and Control' (MENG485), which support the students in their senior design projects and provide them with the necessary knowledge in areas that the market needs.
- The Panel notes that the MEN programme contains the 'Engineering Management' (MENG420) and 'Engineering Ethics' (MENG400) courses in addition to a wide range of elective courses, which develop the professional and employability skills of the future graduates. Furthermore, the MEN programme includes two project courses (MENG 290 and MENG 490), which are strong and positive elements in the programme. However, research skills and attributes are only indirectly included in the PILOs and some of these courses. Therefore, the Panel recommends that the College should ensure that research methodologies are taught to MEN students and that sufficient support is provided to assist them in implementing these methodologies in their research projects.
- Course delivery details are specified in the course specification forms, which include a mapping of the CILOs to the course topics and assessments as well as the required textbooks and references. The Panel notes that the textbooks are current and appropriate. There is also evidence of utilization of recent research findings and current professional practice in course materials and teaching/learning activities that was noted and confirmed during interviews.

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

- UoB developed and approved in 2018 a Teaching and Learning Policy where general principles/guidelines for the teaching and learning are included for the programmes to follow. The teaching and learning methods stated in the programme and course specification forms are aligned with the PILOs and the CILOs as per the institution's teaching and learning design requirements. These methods are also aligned with the institutional teaching strategies, which place emphasis on interactive learning activities, the use of technology and the empowerment of the students to take responsibility of their own learning and develop their lifelong learning skills.
- The MEN Department developed e-learning practices especially during the Covid-19 period where online teaching was applied. As per the SER and the provided evidence, the academic staff use MS Teams, Blackboard and other online tools to support their teaching. Students get access to the course materials, quizzes, learning exercises, and discussion boards through the Blackboard. The UoB also issued the Quality Assurance Guidelines for the Precautionary Period, which clearly cover online teaching, learning and assessments.
- The learning environment in the programme encourages students' exposure to professional practice and enhances their research capabilities. The Panel notes that the course contents together with the teaching and learning strategies deployed by the MEN Department encourages students to develop practical skills and their ability to create and innovate. For example, in the two project courses (MENG290 and MENG490), students work on the development and design solutions of real engineering problems, which enhances their innovation and creativity.

Indicator 1.5: Assessment Arrangements

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

Judgment: Addressed

- The MEN programme adheres to several assessment policies and procedures, which are specified in the institution's Quality Manual, Study and Examination Regulations, and Moderation of Assessment Regulations. The Panel notes that the theoretical elements of the courses are assessed through quizzes, assignments, examinations, presentations, projects, case studies, and research projects. Practical skills are evaluated in both formative

and summative assessments, presentations, and laboratory works. There are also clear criteria for marking, and appropriate mechanisms for providing students with prompt feedback on their progress and performance, which assist further learning. In addition, there are appropriate provisions for internal and external moderation of assessments. The Panel also notes that the regulations for addressing academic misconduct and appeals are well-documented and implemented at the MEN programme level.

Standard 2

Efficiency of the Programme

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

Indicator 2.1: Admitted Students

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

Judgment: Addressed

- The MEN programme has clear admission criteria, which are guided by the UoB general admission requirements and published in printed documents and on the website of the University. The Panel notes that the admission criteria have different weightage points (70% for secondary school score, 15% university aptitude test score and 15% interview score). The Panel also notes that the admission criteria do not differentiate between male and female applicants, requiring a minimum Cumulative Grade Point Average (CGPA) of 70% in the secondary school certificate from all applicants.
- As per the SER, all accepted students take a one-semester orientation programme, which includes English language courses. Students with CGPA of 90% and above in the secondary school certificate are exempted from the orientation programme. Exemptions are also granted for students who have passed the TOEFL test with 500+ points or the IELTS with 5.5+ points or the university's English exemption examination. During the site visit virtual interviews, the Panel was able to confirm that remedial support measures are in place and adequate. There are also appropriate arrangements that enable students to internally and externally transfer from other departments and universities to the MEN programme. However, the Panel was not provided with sufficient evidence to demonstrate that admission requirements and the remedial measures are regularly revised in light of student performance and feedback from relevant stakeholders, in addition to national and international benchmarks. Therefore, the Panel recommends that the College should regularly revise the admission criteria and the effectiveness of the remedial measures 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.

Judgment: *Partially Addressed*

- The University has adequate policies and regulations for the recruitment, induction, appraisal and promotion of academic staff, which are consistently implemented in a transparent manner at the MEN programme level. The Panel was informed during the virtual site visit interviews, that the induction of new academic staff is taking place at both the university and department levels. The Panel notes that the promotion requirements include a certain level of quality and a minimum number of publications for the different academic ranks. The Panel advises the College to publish guidelines for academic staff specifying the acceptable publication venues.
- As per SER, the Deanship of Graduate Studies and Scientific Research follows-up the scientific research matters and encourages staff to engage in scientific research by providing research grants and awards as well as research capacity building workshops. The Panel appreciates the variety of workshops provided to the academic staff to help them steer the quality of their research work and output.
- The provided evidence shows the qualifications of 16 academic staff in the MEN Department. The Panel notes that their specializations cover the broad field of Mechanical Engineering in the thermal, manufacturing, control, design, materials, etc. However, as per the SER, the MEN Department needs to hire more academic staff and laboratory technicians to reduce the teaching load and to allow faculty to engage more effectively in scientific research and community engagement activities. The SER also indicates that there are efforts in place to hire more academic staff and laboratory technicians. Therefore, the Panel recommends that the College should expedite the process of hiring new academic staff and laboratory technicians to reduce the teaching workload as well as the student-to-staff ratio.
- During the site visit interviews, the Panel was informed that the special needs of women are taken into consideration *via* the University Academic and Administrative Bylaws, which are implemented. However, the Panel notes that there are no female academic staff members in the MEN Department and therefore the Panel advises the Department to make more efforts to attract female academic staff to the Department.
- The SER does not refer to any measures in place to monitor staff turnover and ensure the retention of highly qualified academic staff members. Therefore, the Panel recommends

that the College should regularly monitor staff turnover and develop measures that ensure the retention of highly qualified academic staff.

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: Partially Addressed

- During the site visit tour, the Panel noted that the MEN Department has a sufficient number of classrooms, meeting rooms, computer laboratories and offices for academic and non-academic staff, which are appropriately equipped with computers, projectors, and interactive whiteboards with direct Internet connectivity. The Department has also eight MEN laboratories, which do not include sufficient and adequate equipment. During the site visit tour, the Panel noted that some of the equipment in these laboratories were not functioning and outdated. Therefore, the Panel recommends that the College should ensure that the MEN laboratories are properly equipped with sufficient equipment and well-maintained.
- In addition to the Central Library at the UoB Sakhir campus, there is an Engineering Library located in the Isa Town campus, where the MEN programme is offered. During the site visit tour, the Panel noted that the Engineering Library is well-equipped with sufficient hard copies and digital resources that support teaching, learning and research. The Panel appreciates that the Engineering Library is well-equipped with e-books and electronic journals which support the teaching, learning and research needs of the MEN academic staff and students.
- As per the SER, the College of Engineering is responsible for ensuring the maintenance of its buildings and facilities in line with the institutional occupational health and safety arrangements. During the site visit tour, the health and safety signs and instructions were well displayed and clear. The Panel noted the availability of safety exits and fire extinguishers, which are provided in adequate number and with instructions of use. The Panel was also informed that evacuation drills are conducted to ensure the safety of students in cases of emergency. The provided evidence includes samples of maintenance requests and the safety measures for students in the MEN Department.

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 has an effective Student Information System (SIS), which is used to record and manage information regarding students' admission, registration and progression, as well as course evaluations, approval of grades, grade appeals and academic advising. The reports that the SIS generate are used by academic and administrative staff for academic planning and decision-making purposes. Students also have access to the SIS to register for courses, check their final grades and evaluate their courses. They also have access to a learning management system, Blackboard, where all the material of their courses are posted. Students and staff can access these systems only by signing in with UoB credentials. The Panel appreciates the solid Management Information System utilized to inform decision-making.
- The Panel was provided with some samples of generated tracking reports of the utilization of laboratories, library resources and e-learning that are used in making decisions to improve the utilization of these resources. The Panel was also provided with an IT risk management plan, which includes regular backups on different servers on and off campus.
- There are policies and procedures in place to ensure the security of learners' records and accuracy of results. As per the SER, the Head of Department (HoD) approves the final grades of the MEN students after cross-checking them with course coordinators to ensure the accuracy of the grades, which are entered into the SIS by the academic staff. During the site visit virtual interviews, the Panel was informed that the awarded certificates and transcripts are issued in a timely manner and are accurate. The Panel was also provided with samples of certificates and transcripts that reflect the achieved learning by students.

Indicator 2.5: Student Support

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

Judgment: *Addressed*

- As mentioned earlier in this Report, students are provided with reasonable physical and e-resources, including well-equipped classrooms and libraries in addition to e-mails on the university domain and access to the SIS and Blackboard. However, the MEN laboratories are not well equipped and there is a need to hire more laboratory technicians (see the recommendations under Indicator 2.2).
- The Deanship of Students Affairs is responsible for providing students with social, behavioral and psychological guidance. At the beginning of each academic year, newly admitted students are provided with two induction days that are organized by the Deanship of Students Affairs at the institutional level and the College of Engineering at the college and department levels. The induction activities aim to introduce the newly admitted students to the different services provided by the University including the library services. They also get some information on the university life and their rights and duties during their study period.
- The SER did not provide information about career guidance services and support to help students prepare for their careers. However, the Panel was informed during the virtual site visit interviews that there is a dedicated Career Counseling Office at the institutional level, which provides the students with different workshops and career guidance.
- As per the SER and the Academic Advising Regulations, each student is assigned an academic advisor to monitor his/her academic progress and achievements. Students receive their invitations to advising meetings *via* the SIS and all the advising notes and comments are entered into this system. Students at risk of academic failure are also monitored *via* the SIS by their academic advisors. They are required to meet more often with their academic advisors who follow-up their progress with the course instructors. Students with special needs are also supported through their academic advisors in conjunction with the Guidance and Counseling Department of the Deanship of Students Affairs. The reported survey results show that students are satisfied and are benefiting from the different support services provided by the College and the University.

Standard 3

Academic Standards of Students and Graduates

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

Indicator 3.1: Efficiency of the Assessment

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

Judgment: Addressed

- The course specification forms include various assessment methods that are suitable to evaluate the MEN theoretical and practical courses and that escalate in complexity in higher-level courses. As per the SER, the MEN Department ensures the implementation of the Engineering College and UoB assessment policies and procedures in line with the Study and Examination Regulations and the Quality Assurance and Enhancement Policy, all assessments are linked and mapped to CILOs, PILOs and graduate attributes.
- The Panel notes that there are appropriate mechanisms in place to evaluate the achievement of the PEOs and the PILOs through the assessment of the CILOs and through the surveys, which assess the satisfaction of the alumni and employers with the graduate attributes that are embedded in the PILOs and the UILOs. The Panel is also satisfied with the mechanisms used to monitor and improve assessments. These mechanisms include the internal and external moderation processes, quality audits conducted by the Quality Committee at the college level and the annual self-evaluations conducted at the department level.

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: Addressed

- The academic integrity related policies and regulations are well-documented and disseminated *via* the university website and known by staff and students, as confirmed during the virtual site visit interviews. As per the SER, the MEN Department ensures the

implementation of these policies and regulations, which include the Anti-Plagiarism Policy and Study and Examination Regulations. Students are introduced to these policies and regulations during their induction at the university and the college levels and in the introductory session of each course.

- As per the SER, invigilators are provided with training on the different forms of cheating and the steps that are taken to handle cheating and misconduct cases in examinations. The Lockdown Browser and Respond is used to detect cheating in the examinations that are conducted through the online platforms, and Turnitin is used to detect plagiarism. The provided evidence confirms that suspected cases of cheating and academic misconduct are recorded, and appropriate actions are taken.

Indicator 3.3: Internal and External Moderation of Assessment

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

Judgment: Addressed

- The moderation of the MEN programme is based on a course rolling plan and is in line with the related policies and regulations including the Moderation of Assessment Regulations and the Study and Examination Regulations. The Moderation process includes internal pre-assessment moderation, internal post-assessment moderation and external-post assessment moderation. The selection of internal and external moderators for courses is based on their expertise in the subject areas. The Panel notes, however, that the moderation policies and regulations do not include detailed procedures related to the appointment and approval of external moderators. The Panel recommends that the College should revise the policies and regulations related to external moderation to include clear criteria for the appointment and approval of external moderators. The Panel also advises the College to establish formal links through memoranda of understanding or cooperation with other local, regional and international universities to ensure the effectiveness of external moderation.
- The Panel notes that there are well-defined criteria for pre-assessment and post-assessment moderation, which include course syllabi, the mapping of the CILOs to assessments and PILOs, suitability and difficulty levels of examinations, distribution of marks, and fairness of grading. The provided evidence includes a moderation data analysis report and samples of internal and external moderation forms. As per the SER, the findings of internal and external moderators are communicated to the course coordinators, which in turn communicate these findings to the Moderation Committee and subsequently to the Quality Assurance Committee (QAC) at the department level, which monitors the moderation process to ensure its effectiveness and the continuous

improvement of the MEN programme and its courses. The Panel notes from the filled moderation forms that the reliability, consistency, appropriateness, and accuracy of assessments are validated during the internal pre-assessment moderation, while the accuracy, consistency, and fairness of marking are verified in the internal and external post-assessment moderation. The evidence also shows changes to assessments as a result of the internal and external moderation.

Indicator 3.4: Work-based Learning

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

Judgment: Addressed

- Work-based learning is carried out as part of several courses in the MEN programme, which include laboratory work and the students are requested to write technical laboratory reports that are used to assess learning outcomes. These courses include 'Properties of Materials' (MENG201), 'Manufacturing Processes' (MENG310), and 'Measurements and Instrumentation' (MENG381). The MEN programme also includes an 'Industrial Training' (MENG290) course, which contributes effectively to the achievement of the learning outcomes.
- The University has appropriate policy and procedures for the industrial training to manage student industrial placements and ensure an equivalent experience amongst all students. The Panel notes that the roles and responsibilities of different parties are clearly defined in the Industrial Training Policy and Procedure. During the virtual site visit interviews, the Panel was also informed that roles and responsibilities are communicated to the training providers through meetings between the industrial training course coordinator and the training providers.
- The 'Industrial Training' (MENG290) course has clear CILOs, which contribute effectively to the achievement of the PILOs. These CILOs are mapped to the assessment methods and the PEOs and PILOs. The Panel notes that assessment methods of the Industrial Training course are appropriate and include reports and presentations that are assessed by the course supervisors. In the virtual site visit interviews, the Panel confirmed that the students and internship supervisors evaluate the internship course through surveys to improve the work placements experience.

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 MEN programme includes a 'Junior Project' (MENG290) course and a 'Senior Project' (MENG490) course. The latter is an important component of the programme, which connects the knowledge and skills gained through the different courses to real life practical applications. The responsibilities of the students and supervisors for the Senior Project course are clearly defined in the SER and the Guidelines for Senior Projects. The Senior Project Committee is responsible for setting standards and procedures for the Senior Project Course. As per the SER, the Senior Project Committee 'conducts lectures to inform students of the entire procedure and the criteria for submitting the project'. The Panel advises the MEN Department to include all the regulations and procedures related to the senior project in one document and to ensure that it is accessible to students and supervisors in printed form and on its website.
- The Panel notes that the senior project contributes effectively to the achievement of the learning outcomes. The CILOs of the senior project course are mapped to the PILOs. The achievement of those CILOs and PILOs are measured using specifically designed grading sheets.
- The Panel notes that the progress of the students in their projects is regularly monitored by their supervisors, in line with the Guidelines of Senior Projects. During the virtual site visit interviews, students confirmed that their progress is regularly monitored, and feedback and guidance are given to them throughout the duration of the projects.
- The Panel notes that there is appropriate assessment of the 'Senior Project' (MENG490) course. The project proposals are evaluated by an academic committee and the MEN Department based on the criteria listed in the Senior Project Proposal Form. The Senior project report is evaluated by the project supervisor (50%), two internal examiners (40%) and one external examiner (10%). Students are also required to submit a poster and a presentation as part of their viva-defense. The Senior Project Committee oversees the implementation of the regulations and procedures related to the senior design projects. Senior projects issues are also discussed in the MEN Department Council.

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*

- Based on the provided evidence, which includes the results of the assessment of the MEN PILOs and samples of students' assessed work from different course levels including senior projects, the Panel is satisfied that the level of students' achievements is appropriate and reflects their ability to create and innovate.
- The Panel notes that number of students registered in the MEN programme decreased from 587 in 2017-2018 to 339 in 2021-2022. Approximately 95% of the 339 students that were registered in 2021-2022 are male and 10% of them are regional and international students. The average number of students admitted to the programme was 137 students for the last five years. The average length of study was 4.89 years and the average number of the graduates from the programme was 95 graduates per year in the last five years. Overall, the Panel is satisfied that the ratios of admitted students to successful graduates including year-on-year progression and length of study are consonant with those on equivalent programmes.
- The Panel notes that the student progression and destinations are tracked, analyzed and discussed and action plans are set based on the student progression and graduation records and based on the alumni, employer and market surveys and studies. Based on the output of the alumni and employer surveys and based on the interviews with the alumni, members of the Programme Advisory Committee (PAC) and employers, the Panel notes that the graduates of the programme and their employers are satisfied with the programme outcomes.

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.

Judgment: Addressed

- The University has appropriate institutional policies and regulations that govern the functions of the MEN programme and meet the needs of academic staff and students. The Panel notes that these policies and regulations are recent and regularly updated as evidenced by the version number and dates stated on the provided documents. During the virtual site visit interviews, the Panel confirmed that all policies and regulations are available online to the relevant stakeholders.
- The Quality Manual clearly describes the institutional quality management system, Quality Assurance (QA) policies and procedures, QA tools and the roles and responsibilities of the related posts and committees at the institution, college and programme levels. The Panel notes that there is a Quality Assurance Office (QAO) and a QAC, which are responsible for monitoring QA activities at the college level. The Panel also notes that there are implemented mechanisms at the department level to ensure the implementation of QA policies and procedures. The consistency in the implementation of these policies and procedures across the College is ensured by the QAC which includes representatives from the different Departments in the Engineering College.
- Based on the site visit virtual interviews with academic staff, the Panel notes that they are well-aware of their specific roles and responsibilities in ensuring the quality of the MEN programme through the moderation of the assessments, preparation of course e-portfolios and the assessment of students' achievements. The Panel was able to confirm that the quality management system is regularly revised and improved through the preparation of the Annual SERs and based on the recommendations of the external local and international accreditations.

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 organizational chart of the College is appropriate for the management of the programme. The SER clearly describes the management structure of the MEN programme, which is in line with the UoB Academic and Administrative Bylaws. It includes the Dean of the Engineering College and the Head of the MEN Department, supported by the different councils and committees at the college and department levels.
- The Panel notes the existence of clear communication and reporting lines starting from the academic staff to the Department Council headed by the HoD who reports to the Dean through the College Council. The HoD also conveys and reports decisions, proposals and resolutions to the academic staff during the department council meetings. The Dean of the College reports to the University Council and raises the issues and requests of the different departments and programmes to the UoB management.
- The main academic committees and the different management posts have clear Terms of Reference (ToRs), which clearly state their roles and responsibilities. The Panel recommends that the College should ensure that all the committees at the college and department levels have clear ToRs and are listed in the document, which includes the responsibilities of the different committees.
- The Panel notes from the virtual interviews and the provided evidence that the custodianship of the academic standards rests on the department, college and institutional levels through the concerned councils and committees. At the department level, the HoD has the overall responsibility of the MEN programme and acts as the programme coordinator. The academic responsibilities are also clearly assigned to the different department committees. Based on the feedback of the internal and external stakeholders during these interviews, the Panel confirms that there is an appropriate management of the MEN programme, which demonstrates 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: Partially Addressed

- The MEN programme evaluation is conducted annually as stipulated in the Quality Manual and results are compiled in a comprehensive Annual SER, which includes inputs from different sources (i.e., admissions, assessment of PILOs, surveys, etc.) and recommendations for improvements. Furthermore, there is a Continuous Improvement Cycle Report for every academic semester, which contains the evaluation of the achievements of the CILOs, and recommendations for improvement. As per the Quality Manual, which requires an annual action plan to be produced at the end of each internal evaluation cycle, both the Annual SERs and Continuous Improvement Cycle Reports include improvement and action plans with specific proposed actions and timeframes. However, no clear mechanisms for ensuring the implementation of improvement plans are reported in the SER. Therefore, the Panel recommends that the College should develop mechanisms to monitor and track the implementation of the improvement action plans that are included in the Annual SERs and Continuous Improvement Cycle Reports.
- The Panel notes that the roles and responsibilities of individuals and committees at the UoB and MEN programme level, as well as the necessary steps, are clearly stated in the Quality Manual to ensure the proper implementation of the periodic reviews. As per the SER, the MEN programme is externally reviewed by academic experts, and the modified curriculum was recently approved by the University Council. The revision of the curriculum was based on the benchmarking study conducted by the MEN Department, the annual self-evaluation of the programme and the feedback received from the PAC and the Student Advisory Committee (SAC). However, the Panel was not provided with sufficient evidence to prove that periodical reviews are conducted on a regular basis in line with the Quality Manual. Therefore, the Panel recommends that the College should ensure that the periodic reviews of the programme are regularly implemented in line with the procedures specified in the Quality Manual.

Indicator 4.4: Benchmarking and Surveys

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

Judgment: Addressed

- The programme was recently benchmarked against seven regional and international ABET-accredited MEN programmes. The similarities and differences were highlighted in the MEN Benchmarking Report, which covered different aspects of the programme such as admission requirements, PILOs and the number of credit hours allocated to core, supporting and elective courses. The Panel confirmed during the virtual interviews that the benchmarking activities have led to major changes in the curriculum. For example, the

period of the senior design project was extended to two semesters based on the benchmarking outcomes.

- The MEN Department conducts regular meetings with PAC and SAC and uses several periodic surveys to collect the feedback of internal and external stakeholders. These surveys include senior exit surveys, course evaluation surveys, faculty surveys, alumni surveys, employer surveys and market surveys. The Panel notes that the collected comments from the different stakeholders are analyzed and discussed in the department council meetings. The Panel also notes that action plans are set in the Annual SERs based on the feedback received from internal and external stakeholders. During the virtual interviews with SAC and PAC members, alumni and employers, the Panel notes that stakeholders are satisfied with changes implemented in the MEN programme. However, the SER does not refer to the mechanisms used to inform stakeholders about the changes that were made based on the survey results and their suggestions. Therefore, the Panel recommends that the College should develop mechanisms to inform the different stakeholders about the results of the surveys and the actions taken based on these results. The Panel also suggests introducing an alumni club for the alumni to meet and share their experiences with each other and with the MEN administration.

Indicator 4.5: Relevance to Labour market and Societal Needs

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

Judgment: Addressed

The MEN programme has a functioning PAC with clear roles and responsibilities that are defined in its ToR. The PAC includes industry representatives, employers and alumni. As per the SER, the PAC meets regularly every six months. As mentioned earlier in this Report, the feedback and suggestions of the members of the PAC are compiled and reported in the Annual SERs and action plans are set based on their feedback and suggestions are made with clear responsibilities and timeframes. The PAC members confirmed to the Panel during the virtual interviews that they have noticed some positive changes in the MEN curriculum based on their feedback and suggestions.

- During the virtual interviews the Panel was informed that the MEN Department is continuously monitoring and reviewing the whole feedback process and its mechanisms including the market surveys and the meetings with the PAC and SAC to ensure the alignment of the programme with the labour market and societal needs. The Panel also notes that a market survey was recently conducted with 27 institutions and its results were compiled in a market survey analysis report, which includes recommendations for

improvement. The Panel recommends, however, that the College should conduct more detailed market analyses and studies on a regular basis using tools other than surveys, such as interviews and published statistics, to ensure that the MEN programme meets the labour market needs.

V. Conclusion

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

There is "Confidence" in the Bachelor of Science in Mechanical Engineering of the College of Engineering offered by the University of Bahrain.

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

1. The academic staff are provided with a variety of workshops to help them steer the quality of their research work and output.
2. The Engineering Library is well-equipped with e-books and electronic journals which support the teaching, learning and research needs of the Mechanical Engineering academic staff and students.
3. The solid Management Information System utilized to inform decision-making.

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

1. Ensure that research methodologies are taught to Mechanical Engineering students and that sufficient support is provided to assist them in implementing these methodologies in their research projects.
2. Regularly revise the admission criteria and the effectiveness of the remedial measures in light of student performance and feedback from relevant stakeholders, in addition to national and international benchmarks.
3. Expedite the process of hiring new academic staff and laboratory technicians to reduce the teaching workload as well as the student-to-staff ratio.
4. Regularly monitor staff turnover and develop measures that ensure the retention of highly qualified academic staff.
5. Ensure that the Mechanical Engineering laboratories are properly equipped with sufficient equipment and well-maintained.
6. Revise the policies and regulations related to external moderation to include clear criteria for the appointment and approval of external moderators.

7. Ensure that all the committees at the college and department levels have clear terms of references and are listed in the document, which includes the responsibilities of the different committees
8. Develop mechanisms to monitor and track the implementation of the improvement action plans that are included in the Annual Self-Evaluation Reports and Continuous Improvement Cycle Reports.
9. Ensure that the periodic reviews of the programme are regularly implemented in line with the procedures specified in the Quality Manual.
10. Develop mechanisms to inform the different stakeholders about the results of the surveys and the actions taken based on these results.
11. Conduct more detailed market analyses and studies on a regular basis using tools other than surveys, such as interviews and published statistics, to ensure that the Mechanical Engineering programme meets the labour market needs.