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National Authority for Qualifications &
Quality Assurance of Education & Training



Directorate of Higher Education Reviews

Programmes-within-College Reviews Report

**Bachelor of Science in Mechatronics Engineering
College of Engineering
AMA International University
Kingdom of Bahrain**

**Date Reviewed: 6-8 December 2015
HC074-C2-R074**

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Acronyms

ABET	Accreditation Board for Engineering and Technology
AMAAT	AMA admission test
AMAIU	AMA International University
BSME	Bachelor of Science in Mechatronics Engineering
CILOs	Course Intended Learning Outcomes
CIS	Campus Information System
CQI	Continuous Quality Improvement
CRC	Curriculum Review Committee
DHR	Directorate of Higher Education Reviews
EAC	Engineering Accreditation Commission
FDP	Faculty Development Plan
GPA	Grade Point Average
HEC	Higher Education Council of the
HRD	Human Resources Department HRD
HRMS	Human Resource Management System
ILO	Intended Learning Outcome
IQA	Internal Quality Audits
MIS	Management Information Systems
PAST	Performance Appraisal Systems for Teachers
PD	Professional Development

PEO	Programme Educational Objectives
PIAP	Programme Industry Advisory Panel
PILOs	Programme Intended Learning Outcomes
PLAO	Placement Linkage and Alumni Office
QA	Quality Assurance
QAAO	Quality Assurance and Accreditation Office
QMS	Quality Management System
QQA	National Authority for Qualifications & Quality Assurance of Education & Training
SER	Self-Evaluation Report
SES	Self-Evaluation Survey
SO	Student Outcomes
TBI	Teacher's Behaviour Inventory
TLA	Teaching learning and Assessment
TOS	Table of specifications
WBL	Work-based Learning

The Programmes-within-College Reviews Process

A. The Programmes-within-College Reviews Framework

To meet the need to have a robust external quality assurance system in the Kingdom of Bahrain, the Directorate of Higher Education Reviews (DHR) of the National Authority for Qualifications & Quality Assurance of Education & Training (QQA) has developed and is implementing two external quality review processes, namely: Institutional Reviews and Programmes-within-College Reviews which together will give confidence in Bahrain's higher education system nationally, regionally and internationally.

Programmes-within-College Reviews have three main objectives:

- to provide decision-makers (in the higher education institutions, the QQA, the Higher Education Council (HEC), students and their families, prospective employers of graduates and other stakeholders) with evidence-based judgements on the quality of learning programmes
- to support the development of internal quality assurance processes with information on emerging good practices and challenges, evaluative comments and continuing improvement
- to enhance the reputation of Bahrain's higher education regionally and internationally.

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

Indicator 1: The Learning Programme

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

Indicator 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 3: Academic Standards of the Graduates

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

Indicator 4: Effectiveness of Quality Management and Assurance

The arrangements in place for managing the programme, including quality assurance, give confidence in the programme.

The Review Panel (hereinafter referred to as ‘the Panel’) states in the Review Report whether the programme satisfies each Indicator. If the programme satisfies all four Indicators, the concluding statement will say that there is ‘confidence’ in the programme.

If two or three Indicators are satisfied, including Indicator 1, the programme will receive a ‘limited confidence’ judgement. If one or no Indicator is satisfied, or Indicator 1 is not satisfied, the judgement will be ‘no confidence’, as shown in Table 1 below.

Table 1: Criteria for Judgements

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

B. The Programmes-within-College Reviews Process at the AMA International University

A Programmes-within-College review of the programmes offered by the College of Engineering at AMA International University was conducted by the DHR of the QQA in terms of its mandate to review the quality of higher education in Bahrain. The site visit took place on 6-8 December 2015 for the academic programmes offered by the College, these are: Bachelor of Science in Mechatronics Engineering and Bachelor of Science in Informatics Engineering.

This Report provides an account of the review process and the findings of the Panel for the Bachelor of Science in Mechatronics Engineering based on the Self-Evaluation Report (SER) and appendices submitted by AMA International University (AMAIU), the supplementary documentation made available during the site visit, as well as interviews and observations made during the review site visit.

AMAIU was notified by the DHR/QQA on 15 April 2015 that it would be subject to a Programmes-within-College reviews of the programmes offered by the College of Engineering with the site visit taking place in December 2015. In preparation for the review, AMAIU conducted a self-evaluation of the two programmes offered by the College and submitted the SERs with appendices on the agreed date on 1 September 2015.

The DHR constituted a panel consisting of experts in the academic field of mechatronics engineering and in higher education who have experience of external programme quality reviews. The Panel comprised four external reviewers.

This Report provides an account of the review process and the findings of the Panel for the Bachelor of Science in Mechatronics Engineering based on:

- (i) analysis of the Self-Evaluation Report and supporting materials submitted by the institution prior to the external peer-review visit
- (ii) analysis derived from discussions with various stakeholders (faculty members, students, graduates and employers)
- (iii) analysis based on additional documentation requested and presented to the Panel during the site visit.

It is expected that AMAIU will use the findings presented in this Report to strengthen its Bachelor of Science in Mechatronics Engineering. The DHR recognises that quality assurance is the responsibility of the higher education institution itself. Hence, it is the right of AMAIU to decide how it will address the recommendations contained in the Review Report. Nevertheless, three months after the publication of this Report, AMAIU is required to submit to the DHR an improvement plan in response to the recommendations.

The DHR would like to extend its thanks to AMAIU for the co-operative manner in which it has participated in the Programmes-within-College review process. It also wishes to express its appreciation for the open discussions held in the course of the review and the professional conduct of the faculty and administrative staff of the AMAIU.

C. Overview of the College of Engineering

AMA International University-Bahrain was established in September 2002 as a member of the AMA Education System, which is based in the Philippines. Its mission as a private international university is to provide access to quality education through its commitment to outcome-based instruction, research and community engagement to produce highly skilled and competent graduates dedicated to life-long learning, and responsive to the growing socio-economic needs of Bahrain and the region. The College of Engineering was established in 2002 to produce highly competent, multi-disciplinary specialists in the field of engineering who have problem solving skills to meet the diverse demands of the industries and the enthusiasm for conducting research. Directly under the College of Engineering, two programmes are offered, being Bachelor of Science in Informatics Engineering and Bachelor of Science in Mechatronics Engineering. The College of Engineering has sought accreditation for its programmes with the Accreditation Board for Engineering and Technology (ABET) and both of its programmes were accredited under the 'General Criteria Only' in 2013. At the time of the site visit, the College of Engineering had 21 full-time, five part-time academic staff and two full-time administrative staff. The total number of students in the College was 533 students. The majority of registered students are from Bahrain while others are from neighbouring countries as well as internationally.

D. Overview of the Bachelor of Science in Mechatronics Engineering

The Bachelor of Science in Mechatronics Engineering (BSME) programme is offered by the College of Engineering at AMAIU. The programme commenced at the time of AMAIU's establishment to produce graduates who can practice as successful mechatronics engineers for the advancement of society and to promote professionalism in mechatronics engineering practice. The programme had its first intake in 2002, where two students registered during that time. In 2007, the programme graduated 11 students in its first batch. The BSME curriculum was revised to produce updated versions in 2008-2009, 2010-2011 and 2014-2015 in response to local and regional market needs. At the time of the site visit, the total number of graduates were 343, the programme had 373 registered students and there were 16 faculty members contributing to this programme.

E. Summary of Review Judgements

Table 2: Summary of Review Judgements for the Bachelor of Science in Mechatronics Engineering

Indicator	Judgement
1: The Learning Programme	Satisfies
2: Efficiency of the Programme	Does not satisfy
3: Academic Standards of the Graduates	Satisfies
4: Effectiveness of Quality Management and Assurance	Satisfies
Overall Judgement	Limited Confidence

1. Indicator 1: The Learning Programme

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

- 1.1 The College of Engineering at AMAIU has goals and objectives, which are derived from the university's mission, that stipulate producing highly competent graduates with problem solving skills to meet the demands of industry and who have the enthusiasm for conducting research. The BSME programme has a clear academic planning framework, which includes the Programme Educational Objectives (PEOs), programme aims and Programme Intended Learning Outcomes (PILOs). The programme aims state that the programme graduate would 'practice as successful mechatronics engineer for the advancement of society' and 'promote professionalism in mechatronics engineering practice', which are aligned with the university's mission and the college objectives and are appropriate for the level of the programme and its intended purpose. The Panel appreciates that there is a clear academic planning framework for the BSME programme, which specifies the broad purpose of providing the programme and that the aims of the programme are appropriate for the level and type of the programme and are related to the mission of the institution.
- 1.2 The BSME curriculum has been developed by AMAIU to be part of a multidisciplinary programme and has undergone three major revisions, introducing revised curricula in 2008-2009, 2010-2011 and 2014-2015. The total number of credits in the curriculum were respectively changed in each version from 200 to 207 and finally to 204. A more comprehensive review of the curriculum was conducted in 2014, where the programme was accredited under the ABET's 'General Criteria Only'. Graduating students must complete 204 credits over the course of 12 trimesters, not including the remedial courses, by taking 13 to 18 credits per trimester. The Panel notes that the average student workload is appropriate for the programme. The credits are divided among different areas (mathematics and science=61, computing=12, engineering=107, general education and social sciences=24). Furthermore, the curriculum is well organised, has a well-structured course-by-course academic progression and displays a balance between theory and practice with high percentage of programme courses having practical components. The Panel appreciates that the curriculum is appropriate for the level of the programme, provides academic progression and that a high percentage of programme courses have laboratory components within their contents. The Panel also notes that the BSME programme contains two design projects within the final year; 'Mechatronics Engineering Design Project A and B'. Nonetheless, the Panel is concerned that students are introduced to the design component at a late stage in the curriculum. The Panel recommends that the College introduce open-ended problems and/or design sooner than the fourth year of the programme.

- 1.3 The BSME programme contains course specifications, which are well documented using a standard template that includes the course description, textbooks and references, course objectives, Course Intended Learning Outcomes (CILOs), weekly breakdowns of the curricula that include teaching methods and assessments as well as mapping of the CILOs with the PILOs. During interviews, the Panel confirmed that the CILOs and course contents are designed to meet the labour market needs and are updated by an informal benchmarking process with other ABET accredited programmes as well as the feedback from the external examiners and the Programme Industry Advisory Panel (PIAP). The Panel viewed the course syllabi, and notes that they cover all main elements expected for the level and the type of the programme and was found to be at an appropriate level with respect to depth and breadth. Nonetheless, the Panel suggests replacing some of the syllabi that are more traditional, such as those of the 'Power Plant Control Systems' and 'Electronics 2' courses, with contemporary mechatronics engineering related topics that would further enrich the learning experience of the students.
- 1.4 The BSME programme specification states the programme aims and lists the PEOs and PILOs. The Panel notes that the PILOs are clearly articulated in four categories, being; knowledge and understating, subject-specific skills, thinking skills, and general and transferable skills. Furthermore, mapping exists between the BSME programme PEOs, the university's mission and the PILOs. During interview sessions with the programme team, the Panel was informed that the PILOs were adopted directly from the ABET student outcome and benchmarked informally with other institutions to ensure appropriateness of level. The Panel studied the PILOs and notes that these are measurable and appropriate to the type and level of the programme. The Panel acknowledges that the PILOs are measurable, appropriate to the level of the programme, clearly stated in the programme specification, and are made available to students and staff online as well as in the College Catalogue.
- 1.5 The BSME programme incorporates course specification documents that provide information on the CILOs, which are clearly defined. Furthermore, the Panel notes that there are Course Objectives, which are mapped to the CILOs and to the PILOs. The CILOs have been classified into four categories: knowledge and understanding, subject-specific skills, thinking skills, and general transferable skills. Moreover, the programme specification document provides a curriculum skills map that links each course in the programme with the PILOs, allowing the measurement of the achievement of PILOs. The Panel is of the view that these mechanisms can help to ensure the appropriateness of the course ILOs. However, through the examination of the course portfolios, specifically the 'Industrial Attachment', 'Mechatronics Engineering Design Project A' and B courses, the Panel notes that these courses are mapped to every PILO. In other instances, CILOs have no relevance to the mapped PILO and subsequently to the Course Objectives. For example some courses, such as

'Differential Calculus with Analytic Geometry', 'University Physics 2', 'Electric Circuit Theory 2' and 'Programmable Logic Controllers' have mapped 'A1', which is a soft skill being 'An understanding of professional and ethical responsibility', to a technical knowledge skill. Furthermore, there is inconsistency in mapping the CILOs to the PILOs in different documents. For example the laboratory experiments for the 'University Physics 2' course are mapped to PILOs 'a', 'd' and 'g', while the course specification document links them to 'a', 'b' and 'd', and the programme specification document maps them to 'a', 'b' and 'd'. Moreover, during interviews with the faculty members, the Panel noted that the faculty are knowledgeable regarding their course's ILOs but do not have an overall picture of the whole programme mapping. The Panel recommends revising the CILOs to PILOs mapping of the courses to ensure that they are suitable and properly mapped and that faculty members take a more effective role in the mapping of the programme's ILOs throughout various levels to ensure the effectiveness of students' learning process.

- 1.6 The BSME programme has an 'Industrial Attachment' work-based course in the second trimester of the fourth year, which has six credits and a fourth year standing pre-requisite. During this course, students are placed at an industrial workplace and are required to complete 240 hour of onsite training. There is a clear formal and implemented assessment policy for the 'Industrial Attachment' course. Evaluation is accomplished by filling the company visit activity report and grading the industrial attachment accomplishment report. The evaluation of the training supervisor is worth 70% of the final course mark, while the other 30% is assigned by the course advisor. Panel meetings with faculty and students confirmed that they are well informed and knowledgeable of the assessment process of the 'Industrial Attachment' course. During meetings with stakeholders, the Panel noted the satisfaction of the industrial training providers and the students with the Work Based Learning (WBL) component in the BSME programme and the unequivocal support provided by the College of Engineering to enhance the students' WBL environment and improve the programme quality. The Panel appreciates that there is a clear policy for the assessment and supervision of the 'Industrial Attachment' course, which is communicated to stakeholders, and the positive feedback it receives.
- 1.7 AMAIU has a clear and published policy on Teaching, Learning and Assessment (TLA), which is reviewed as needed to ensure the quality of the college's academic operations and teaching methods. The Panel notes that the policy encourages the implementation of different teaching philosophies, learning and assessment methods, as required by the course level and contents, and these are linked to the CILOs in the course specifications. Furthermore, guidelines are published for the delivery of 'Mechatronics Engineering Design Project A and B' as well as the 'Industrial Attachment' course. Moreover, there are laboratory sessions for all major courses that expose students to professional practice through industry standards. During

interviews, faculty members confirmed that the use of 'Moodle' as an e-learning tool is compulsory in the delivery of the courses. In addition, the Panel was informed that the 'Moodle' platform is not only used to upload course material and specifications, but also utilised as a venue for communication and discussions between the course instructor and the students. The Panel is of the view that the TLA policy is appropriate for the achievement of the intended learning outcomes, including independent learning skills and that staff and students are fully aware of the policy. The Panel appreciates the implemented teaching and learning methods that support the attainment of the ILOs.

1.8 The AMAIU has a clear policy on teaching, learning and assessment that includes clear procedures to ensure the accuracy and transparency of the students' assessment and examination. The policy categorises the student course assessments into formative and summative functions, defines how feedback is given to students. Furthermore, there is a Moderation of Assessment policy to ensure the alignment of assessment with learning outcomes and that assessment procedures comply with the assessment policy. All policies are reviewed in accordance to the Review and Approval of University Policies manual and the Programme Head checks the marks for grade consistency and students have the opportunity to go to their advisors and the Dean for any academic issues. Evidence shows that laboratory reports, assignments and examinations have marked feedback for the students, which was confirmed during student interviews. Furthermore, interviews with staff and students confirmed that they are aware of the aforementioned policies, which are incorporated in the Student Handbook that contains information on AMAIU's assessment policy, grading, plagiarism, academic misconduct and appeal systems. The Panel appreciates that the assessment policy and procedures include mechanisms to ensure that students' assessment and examination are conducted in a systematic and transparent manner and that these are known to all academics and students. Nonetheless, the Panel was informed during the interviews that grade distribution is governed by the university's TLA policy and is uniform for all the programme courses despite their level and course contents. Furthermore, the Panel notes that the course specification document does not contain the grade distribution among the different assignments and quizzes. The Panel recommends that the distribution of grades in each course to be made course dependent according to the level and content of the course, and to be published in the course specifications.

1.9 In coming to its conclusion regarding The Learning Programme, the Panel notes, *with appreciation*, the following:

- There is a clear academic planning framework for the BSME programme, which specifies the broad purpose of providing the programme and that the aims of the programme are appropriate for the level and type of the programme and are related to the mission of the institution.

- The curriculum is appropriate for the level of the programme, provides academic progression and has a practical component.
- There is a clear policy for the assessment and supervision of the 'Industrial Attachment' course, which is communicated to stakeholders.
- There are clear and implemented teaching and learning methods that support the attainment of the intended learning outcomes.
- The assessment policy and procedures include mechanisms to ensure that students' assessment and examination are conducted in a systematic and transparent manners and these are known to academics and students.

1.10 In terms of improvement the Panel **recommends** that the College should:

- introduce open-ended problems and/or design earlier than the fourth year in the programme
- revise the mapping of the course intended learning outcomes to the programme intended learning outcomes to ensure proper mapping amongst all courses
- revise the distribution of grades in each course to be made course dependent, and according to the level and content of the course.

1.11 **Judgement**

On balance, the Panel concludes that the programme **satisfies** the Indicator on **The Learning Programme**.

2. Indicator 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.

- 2.1 AMAIU has an institutional admission policy, which has undergone a series of revisions with the latest being published in August 2015. The Panel notes that staff and students are informed of the admission requirements, which are also posted on the university's website and in the Student Handbook. To be admitted, applicants require a high school certificate or equivalent. However, the admission policy does not specify high school subject requirements or a cut-off grade. The main criteria for admission is based on obtaining 70% admission rating which is the sum of the result of the AMA Admission Test (AMAAT) score (70%) and the Dean's interview score (30%). Students who do not meet the AMA admission test requirement for engineering students, (70% in mathematics test and 60% in English test), take remedial courses. However, applicants from AMA International School are exempted from the AMA admission test and the Panel was not provided with clear justification for such exemption. Moreover, the latest revision of the admission policy states 'removal of the science and logic reasoning and incorporate instead in the programme specific mathematics examinations'. During interviews, the Panel was informed that the science component has been incorporated in the engineering programme specific AMAAT mathematics examination. The Panel examined the AMAAT mathematics examination during the site visit, and notes that the science component within the AMAAT mathematics examination is marginal and is not sufficient for evaluating the students' competency in science. This was indicated also in the external examiner's report, which indicates that the test only covers mathematical components. Moreover, application requirements for students transferring from other institutions are defined in the institutional admission policy, but no admission criteria are defined for these students. The Panel recommends that the College revise the admission policy to ensure a better match between the applicant's competencies and the level and type of the programme, and specify clear criteria for admitting transferred students.
- 2.2 The programme attracts mainly Bahraini students but there is a number of students from other nationalities. All students are registered as full-time students and the ratio of male to female students has been relatively steady which was just over 34:1 in 2014-2015. The Panel notes that the high school score of the admitted students range from 53% to 97% with an average of 82%. Whereas indicated earlier, students who do not meet the AMA admission test requirement for engineering students are required to take remedial courses. The Panel notes that evidence shows that these remedial courses ('Remedial Mathematics', 'Modular English 0, 1 and 2'), helped students who failed the AMAAT to improve their scores. For example in the first trimester of 2014-2015 students who took the remedial mathematics course improved their scores on

average from 43.49 prior to taking the course to 73.07 post taking the course. Nonetheless, during interviews, the faculty informed the Panel that the main challenge that students encounter is associated with their academic standards and specifically with regards to their mathematics background, and the Panel also notes that the pass rate in several courses is in the region of 50%. Moreover, the Panel notes that whilst students who fail the AMAAT mathematics examination are able to proceed to the first year of the programme and take engineering and science courses while at the same time taking the remedial mathematics course. The Panel is concerned with the readiness of these students for the engineering and science courses. The Panel recommends that the College ensure that the profile of admitted students matches the BSME programme aims in having adequate mathematical and scientific background that enable them to progress through the programme.

- 2.3 The institution's Organisation Chart provides an outline of the college and programmes' reporting structure. The Dean coordinates with the Programme Head and represents the College in the University Academic Council. The Dean also chairs the Curriculum Review Committee and the meetings with the PIAP. The management of the programme is administered by the Programme Head who decides on matters related to the delivery of the programme and reports to the Dean. The Programme Head is assisted by specialisation coordinators, in main engineering and mathematics areas, who communicate directly with the course coordinators that in turn coordinate with the faculty member assigned to deliver the course. The Panel confirmed from interviews with staff and the reviewed evidence that various committee meetings are held regularly at the college and programme levels, and that academic and administrative staff are well informed about decisions related to the programme management. The Panel appreciates that there are clear lines of accountability with regard to the management of the BSME programme.
- 2.4 The College of Engineering catalogue for 2015-2016 indicates that there are 14 faculty members contributing to the College, where six of them are specialised in fields related to mechatronics engineering and two directly. Nonetheless, evidence provided on faculty specialisation indicates that the College has 21 faculty members who contribute to the delivery of the programme of which two are specialised in mechatronics engineering and eleven in related fields. Moreover, the Panel notes that most of the faculty interviewed and met with during the site visit were very new to the programme, indicating a good amount of recent turnover. The Panel is concerned with the instability in the faculty profile. The Panel viewed evidence of faculty timetables from different sources and notes that these were inconsistent and the Panel advises that the College should keep better records of its faculty teaching loads. The Panel also notes from the evidence and interviews that while the credit hours on the staff timetables are maintained within the institution's load assignment criteria, the teaching hours and administrative load of some faculty members is high. In addition, the Panel

was informed during the site visit that faculty members are often requested to fill for other faculties who leave the College abruptly. This instability and heavy teaching and administrative load has resulted in a lack of faculty research activities, as depicted in the provided evidence. The Panel urges the College to revise its policy on faculty workload to ensure that these are suitable and provide the faculty with the time needed to participate in research and community engagement.

- 2.5 AMAIU has clear policies and procedures in place for recruitment, appraisal and promotion, which are detailed in the Faculty Manual. These policies are disseminated to newly hired faculty members through an orientation programme delivered by the Human Resources Department (HRD), the Dean and a peer-monitoring scheme. Faculty appraisal is conducted every trimester to evaluate faculty teaching ability and other attributes that cover advising, research, university and community services, where input is provided by the Dean, Programme Head and students. During staff interviews, the Panel confirmed that the staff are satisfied with the arrangements in place for the orientation programme and staff appraisal, and that two staff members were promoted in 2012 and 2013. Faculty recruitment is initiated by the Dean then submitted to the HRD, who post an advertisement for vacancy, if necessary, at the university websites as well as local online recruitment websites. The Panel notes from interviews and the SER that the hiring request is submitted according to short term need (two months before each trimester) without referring to an overall hiring plan that studies the long term teaching requirements necessary to cover the various sub-specialisations of the programme. Furthermore, the Panel noted from interviews that there are frequent changes in the staff during a semester and some core courses within the BSME programme are taught by staff from other disciplines. The Panel notes that the BSME programme has hired in the recent months a number of faculty to support the teaching and learning of the programme. However, there is a need for the BSME programme to engage in strategic human resources hiring plan that focuses on hiring and retaining full-time faculty with academic expertise and skills in mechatronics engineering. The Panel is of the view that a hiring plan is required to sustain the programme and to ensure the ability to cover the teaching load prior to each new trimester. The Panel recommends that the College should develop and implement a long-term plan to improve staff retention rates and recruit full-time faculty members who have long-term commitment to ensure effective delivery of the programme.
- 2.6 AMAIU has a Management Information System (MIS) comprising of two platforms, namely, the Campus Information System (CIS) and the Human Resource Management System (HRMS). The CIS includes the Registration System, Admission System, Student Financial System and Grading System. Various reports and aggregated data can be retrieved from the CIS. To help the advising process, the CIS provides curriculum and progression plans as well as list of students at risk of academic failure. Furthermore, faculty members can generate reports on students' graduation

eligibility, and also use the CIS to submit course grades, where these are monitored by the Dean. During interviews, the staff were able to demonstrate how the MIS platforms are used to obtain information about the weekly activities of the faculty members and staff, the use of library and e-resource, as well as cohort data. The Panel notes that the AMAIU MIS provides adequate reports that can be utilised for monitoring and decision-making purposes by the administration and faculty at different level of authorisation.

- 2.7 AMAIU has policies on securing student records, for data backup and restoration and on grade erratum. Touring the campus, the Panel observed that there is a systematic filing and safekeeping of student records. Every student has a physical folder holding his/her information in addition to a scanned electronic version of it. Students' folders are stored in filing cabinets located at a securely locked and safe room at the registration office. Faculty members have a time-locked privileged access to grade entry to ensure accuracy and integrity of students' records. Furthermore, grades can only be changed after getting an approval by the Dean, Registrar and the internal auditor. The Panel reviewed the samples of audit trails and found that it is sufficient to detect unauthorised access. The Panel was informed that all activities performed by the MIS are backed up regularly and two copies are saved into hard disks, which are stored in a secured fireproof vault, as well as on an off-site back-up facility. Moreover, access levels are implemented to ensure that only authorised users can access the appropriate data. The Panel appreciates the availability of effective policies and procedures that are consistently implemented to ensure security of learner records and accuracy of results.
- 2.8 The Panel toured the College facilities and visited the registration office, admission office, students' counselling office, IT centre, laboratories, digital library room, the main library, auditorium hall (equipped with audio/video system), prayer rooms, first aid clinic, student lounges and the cafeteria. The Panel found that these facilities are adequate for the programme aims and students' needs, which include Wi-Fi. Furthermore, learning resources are available through 'Moodle' e-learning platform for all the programme courses and through online databases in the Digital Library, such as EBSCO, ACM and IEEE Online Database. The library is equipped with sufficient number of computers and iPads that enable students to access the databases and the eBooks collections of the University. In addition, the library provides adequate and up-to-date books, journals, magazines, and references for the BSME programme, which are available for in-house reading and in multiple copies for off-site loan. The Panel acknowledges the availability of adequate facilities and resources to support the programme. The Panel also visited the laboratories and found that the College has a dedicated laboratory for conducting and displaying senior design projects. Moreover, each laboratory has multimedia projectors and internet connectivity that ease the course delivery and allows students to access e-learning resources. During interviews,

the Panel received positive feedback from the PIAP about the computing and laboratory facilities. However, during interviews with students and alumni, there was concern about the failure in conducting some experiments due to the faulty laboratory module or device, causing students to work in larger group, hence hindering the practical learning experience. The Panel recommends that the College should enforce the implementation of its laboratory maintenance plan and ensure that laboratory resources are regularly monitored and maintained.

- 2.9 During the site visit tour to the digital library, the Panel noted evidence of tracking reports generated by AMAIU Library Monitoring System that regularly tracks the utilisation of AMAIU e-resources and e-reference database. The usage of 'Moodle' e-learning platform is also monitored and statistical reports are generated. In addition, the IT Department uses the HRMS to generate reports about utilisation of classrooms and laboratories. During interviews, staff were able to demonstrate how these reports are disseminated to the programme decision makers, enabling them to evaluate the efficiency of their utilisation, for example on updating equipment and software needs. The Panel acknowledges the existence of tracking systems that determine the usage of laboratories, e-learning and e-resources, and encourages the College to further utilise these systems to ensure that all its learning resources are properly maintained.
- 2.10 During the site visit, the Panel noted that AMAIU provides student support in several areas. The staff at the university library provide adequate assistant to students' library needs and students have access to e-learning whereby all course materials are posted on 'Moodle' platform. Furthermore, the staff at the IT Department provide assistance and support to students on the use of the available IT resources, e-learning tools and installed software in the laboratories, where students have access to an open computer laboratory, which is available from 8:00AM to 8:00PM, Sunday to Thursday. Moreover, the University has a number of consultation rooms whereby faculty members meet with students during consultation hours to provide additional feedback about student's performance and to attend to any other academic concerns, however, these rooms are so close to each other with no doors, causing difficulty in running multiple consultation sessions simultaneously. The Panel also visited the Students Affairs and Guidance Office and learnt that the Office provides support and orientation to students on any co-curricular and/or extracurricular activities, where the Guidance Officer, in coordination with the faculty, provides counselling sessions to the students. The Panel notes that the location of the student's guidance office does not provide adequate privacy for the students seeking counselling support, and suggests facilitating a formal separation between the students' guidance/counselling room and the students' activity office to improve privacy. Nonetheless, during interviews with students and from survey results, the Panel notes that students are satisfied with the various support they receive. The Panel appreciates the university

provisions for student support in terms of library, IT facilities, e-learning, e-resources and guidance.

- 2.11 The University conducts an orientation programme for the newly admitted and transferred students at the beginning of each term to let them be acquainted with its policies and procedures. Students Affairs and Guidance Office is responsible for organising the orientation programme and providing newly admitted students with a copy of the Student Handbook. During interviews, students elaborated that the orientation programme includes a presentation about relevant academic policies and procedures, the composition of the university administration, college faculty and staff, information about the programme, and the facilities at AMAIUB, as well as being briefed about the supports and services provided by the Students Affairs and Guidance Office. During interview sessions, students expressed high satisfaction with the information provided at the orientation day. In addition to the orientation programme, AMAIU offers two non-credited compulsory euthenics courses, 'Euthenics 1 and 2', which provide students with information related to their academic needs, services and facilities of the university and the roles and responsibilities of staff within the College, including assessment, monitoring and appeals. The Panel appreciates the university's approach in orienting newly admitted and transferred students.
- 2.12 AMAIU has a Policy on Student Academic Support Services that defines the roles and responsibilities of the academic affairs and academic support services units. The policy also includes procedures for dealing with students at risk of academic failure, students with special needs and the allocation of an academic advisor for every student. During the site visit, the Panel viewed a sample of student's academic advisor portfolios and found that it contains student's progression documents. During staff interviews, the Panel was informed that course instructors are asked to identify students who fail in the midterm examination and schedule tutorial sessions to provide them with extra support. Moreover, the registrar office submits an at-risk report to the Dean at the end of each trimester, and the Dean issues a notice to every student included in the list and informs their respective academic advisers and the Students Affairs and Guidance Office. Consequently, academic advisers inform at-risk students that the maximum allowable credit units for the following trimester are fifteen. Furthermore, the progress of at-risk students is monitored every trimester and recorded by their advisor and evidence provided indicates some improvements in students' performance. Interviewed students confirmed the above and added that students with learning difficulties are referred by their advisor to the Students Affairs and Guidance Office. The Panel appreciates that there are formal mechanisms for advising and tracking at-risk students.

- 2.13 The Panel visited the Student Affairs and Guidance Office and was informed that co-curricular and extra-curricular annual activities are organised by the Office and by the Students Council, including various sport activities that are organised on-campus utilising the campus sport facilities. Furthermore, the Panel noted that a few students participate in international competitions, such as the World Robot Olympiad competitions, whereby the AMAIU team had won the competition for two consecutive years and the AMAIU students represented the Kingdom of Bahrain in World Robot Olympiad held in Russia in November 2014. Further evidence shows students' participation in community engagement activities such as fund raising events for orphans, charity dish, blood donation, and visits to the industry. The Panel acknowledges the college's efforts in exposing the students to informal learning experience through their participation in a multitude of activities.
- 2.14 In coming to its conclusion regarding the Efficiency of the Programme, the Panel notes, *with appreciation*, the following:
- There are clear lines of accountability with regard to the management of the BSIE programme.
 - There are effective policies and procedures that are consistently implemented to ensure security of learner records and accuracy of results.
 - There are provisions in place for student support in terms of library, IT facilities, e-learning, e-resources and guidance.
 - There are arrangements in place for the orientation of newly admitted and transferred students.
 - There is a formal mechanism for advising and tracking the progress of at-risk students.
- 2.15 In terms of improvement, the Panel **recommends** that the College should:
- revise the admission policy to ensure a better match between the admission criteria and the level and type of the programme, and specify clear criteria for admitting transferred students
 - ensure that the profile of admitted students matches the programme aims in having adequate mathematical and scientific background that enable them to progress through the programme
 - revise its policy on faculty workload to ensure that these are suitable and provide the faculty with the time needed to participate in research and community engagement
 - develop and implement a long-term plan to improve staff retention rates and recruit full-time faculty members who have long-term commitment to ensure effective delivery of the programme
 - enforce the implementation of its laboratory maintenance plan and ensure that laboratory resources are regularly monitored and maintained.

2.16 Judgement

On balance, the Panel concludes that the programme **does not satisfy** the Indicator on **Efficiency of the Programme**.

3 Indicator 3: Academic Standards of the Graduates

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

- 3.1 The BSME programme graduate attributes are stated in the programme specification as the PEOs identifying what alumni should achieve three to five years post-graduation. The PEOs include graduate attributes such as; graduates who would 'practise as successful mechatronics engineers for the advancement of society and promote professionalism in mechatronics engineering practice'. Additionally, eleven PILOs are identified, which are similar to the ABET eleven student outcomes. The PILOs are mapped to the PEOs and each course has its specific CILOs that are mapped to the PILOs and to the assessment tasks, where the CILOs are assessed directly by the achievements of the students. Furthermore, graduate attributes such as lifelong learning skills are evaluated in the 'Mechatronics Engineering Design Project A and B', 'Industrial Attachment' and case studies. During interviews, the Panel was informed that the course instructor submits the course CILOs reports to the Faculty Committee for the Assessment and Evaluation of PILO to assess and evaluate the PILOs and Student Outcomes (SOs). The committee's primary task is to evaluate the performance of the students within the programme in terms of the PILOs and SOs and forward the results to the faculty and other related committees to take action. Furthermore, the Panel was informed during staff interviews that AMAIU has a formal policy for the assessment and evaluation of PEOs, which is primarily based on two surveys; one for the alumni's feedback and the other is dependent on the employers' input. The Panel appreciates that the Graduate attributes are clearly stated as PEOs, which are mapped to the PILOs.
- 3.2 AMAIU has developed a benchmarking policy that stipulates the purpose and procedures for both informal, formal benchmarking and the areas of benchmarking for its programmes. Informal benchmarking have been achieved with three institutions which have similar programmes that are ABET accredited, one in Bahrain, another within the region and one international institution. During the site visit meetings with the programme team, it became clear to the Panel that the informal benchmarking was done on the course level only. It was mainly achieved by matching different courses and was based on the information posted by the institutions on their web pages and within their public documents. Moreover, it was limited to course offerings, course content, assessments and CILOs, where there is evidence of curriculum revision on these basis. Furthermore, the Panel was informed during interviews with staff that the College of Engineering has taken on the initiative to achieve a formal benchmarking with a university in Malaysia. The Panel acknowledges the college's efforts for informally benchmarking the programme with those offered by other institutions. Nonetheless, the Panel recommends that the

College formalise its benchmarking process and expand its scope beyond the course level, as stated in its existing benchmarking policy.

- 3.3 The BSME programme implements the university assessment and monitoring policy, which is part of the AMAIU TLA policy, and there is evidence of the policy being revised in November 2013 by the University Academic Council, as well as the staff being informed of its revision. Further to the internal moderation processes, the College implements an external moderation process using external reviewers for the programme and courses. Moreover, there are external panel of examiners for the assessment of the final year design project course. During interviews, the Panel was informed that the policy is communicated effectively to students and faculty members, and that both the University and the College monitor the implementation of the policy through the Continuous Quality Improvement Committee (CQI). According to the SER, the implementation of the assessment policy is monitored both at the college and institution levels, where the CQI committee monitors and reports on assessment and grading, while at the institution level, the Quality Assurance and Accreditation Office (QAAO) oversees the policy implementation. The Panel notes that there is an improvement plan addressing the recommendations of the CQI reports. Nonetheless, no evidence was provided on the implementation of the improvement plan. The Panel acknowledges that there are clearly stated assessment policy and procedures that are well known by faculty and students and are consistently implemented and subject to reviews. Nonetheless, the Panel recommends that the College should develop a mechanism to systematically monitor the implementation of improvement plans on assessment, which are reported by various committees, to facilitate continuous improvement.
- 3.4 The BSME programme implements the AMAIU policy on PILOs assessment and evaluation through the use of the CILOs evaluation. According to the SER, periodic examinations are subject to internal review to ensure the alignment of assessment with outcomes and are inspected by three levels including the specialisation coordinator, the Programme Head and the Dean. Moreover, all final examinations are reviewed and approved by the external examiner assigned to each course. The Panel viewed course specifications and notes that instructors use a table of specifications to map course elements to the CILOs and how each element is assessed. There is also a CILO assessment plan, which specifies the assessment criteria per CILO. The Panel acknowledges the mechanisms in place to ensure the alignment of assessment with outcomes. Nonetheless, in some of the viewed courses, the Panel notes an inconsistent approach in how an individual CILO is aligned to a particular assessment task. For example, the 'University Physics 2' course is linked with the PILOs 'a', 'b' and 'd', where 'd' covers a range of general and transferable skills but the assessment methods for these are specified as various summative assessments, including prelim examination and final examination. The Panel is of the view that written examinations

are not suitable for assessing the achievement of general and transferable skills, and advises reviewing the process of assigning and mapping assessments to the CILOs and hence PILOs for those courses. Furthermore, the Panel notes that the programme has one threshold, $\geq 50\%$, for success level that is applied to the assessment of CILOs, and hence PILOs. Moreover, the analysis of CILOs is conducted mainly at the final years of the curriculum and primarily for courses at the 500 and 600 levels. In addition, the data of all the courses is aggregated and the average is taken, which is not an accurate evaluation of students performance. For example, in the case of PILO 'B1' or 'SOB', 'an ability to design and conduct experiments, as well as to analyse and interpret data', the students' abilities and skills vary from one year to another and thus the overall aggregated average results in skewing the assessment outcome. The Panel advises the College to revise the mechanisms used for the assessment of CILOs, and student achievement, to provide greater indications of the students' performance and to enable the improvement of the curriculum elements needed to elevate the students' performance.

- 3.5 The BSME programme implements the university's policy on moderation of assessment and its procedures, which govern the programme's internal moderation of the students' assessment. Internal moderation has two formal mechanisms, being; use of the specialised coordinators to ensure the alignment of CILOs to the assessment tasks during pre-moderation, and to ensure the fairness, consistency, transparency and accuracy of the students' assessment criteria, methods and grading system of the course during post-moderation. The CQI committee and the QAAO monitor the efficiency of the internal moderation mechanisms. During interviews with faculty members, the Panel was informed that an internal moderator is assigned to each course and that the faculty members are aware of the internal moderation mechanisms, where the Programme Head selects the moderators and double markers. The sample of the students' work that was available and reviewed by the Panel on site supports the SER's information about the internal moderation process. The Panel notes with appreciation the internal moderation system that contributes to the review and improvement of courses.
- 3.6 The university's policy on moderation of assessment covers the guidelines and procedures of internal and external moderation for all summative forms of student's examinations. The External Examiner Guidelines document provides instructions for the verification of course content, the learning outcomes and assessment. Furthermore, during staff interviews, the Panel was informed that there are external panel examiners for the moderation of the final year design project course. According to the SER, external examiners also pre-moderate final examinations and post-moderate students' assessed work, which includes assessments of industrial attachment. Moreover, their feedback is utilised in preparing improvement plans that are based on their recommendations. The Panel reviewed the courses' moderation of assessment

forms and found that in a few courses a number of forms had missing feedback or input from the external examiners. The Panel notes that the College has a clear policy on external moderation and encourages the College to ensure that the policy is implemented equally for all of the courses.

- 3.7 The Panel viewed samples of course files provided by the College for the BSME programme that included course specifications, lecture notes, students' assessed work, final year projects, 'Industrial Attachment' course reports and examination papers and notes that the level of the used assessment tools is, in general, appropriate for the programme. Furthermore, and as noted in paragraph 3.11, the Panel is satisfied that the level of student achievement in the final year projects and their prototypes are appropriate for the level and type of the programme. Moreover, the Panel viewed a sample of students' course grade sheets and notes that they are within a normal distribution, although slightly skewed towards the lower end of the scale. The Panel met with various stockholders, including alumni, employers, students and PAIP members, and all expressed confidence and support for the programme, and were satisfied with the students' achievements. The Panel is satisfied that the level of students' achievement viewed in students' work, that included an appropriate variety of assessment tools, is comparable with other similar programmes in Bahrain and internationally.
- 3.8 The BSME programme implements a number of mechanisms to assess the achievement of its graduates, which include the mapping and alignment of the CILOs to the PILOs and PEOs. Furthermore, the programme uses indirect measurements, such as senior students' exit surveys, student's self-evaluations, alumni survey, employer survey and the grade distribution of graduates. The Panel studied the Grade Point Average (GPA) distribution of the graduates and notes that the distribution of these in 2014 were from 1.48 to 2.99 and 37% of the graduates achieving a GPA below 2, which is acceptable, where AMAIU grading scale ranges from 1 (being the highest) to 5 (being the lowest). Moreover, alumni and employers' surveys are used to collect external feedback on graduate achievements and the Panel notes the positive survey results (80% alumni satisfaction and 82% employer satisfaction). During interviews, the alumni and employers expressed their satisfaction with the programme and noted that the senior design projects tackle a variety of problems from different fields of mechatronics, mechanics, control and computer engineering that are considered as desirable skills by the employers of the BSME graduates. The Panel is satisfied that statistical reports on the PILOs and PEOs assessments, as well as the survey results, which were provided as part of the supporting material, and interviewed stakeholders, show that the level of achievement of graduates meet the aims and intended learning outcomes for the BSME programme. Notwithstanding the above, the Panel notes that the passing mark is set at 50% of the total mark, which is not the

norm in programmes adopting the credit system. Therefore, the Panel recommends that the College consider the passing mark in its benchmarking activities.

- 3.9 According to the SER, the progression rate of student cohorts from year 1 to year 2 for the academic years 2008-2011 is on average 70%. The progression rates from year 2 to year 3 is 75% and from year 3 to year 4 is on average 81%, resulting in a year-on-year cumulative average of 75%. The published average retention rates in the SER for the same cohorts are 84%, 67%, and 62% respectively, while the retention rates for the academic years 2012-2013 and 2013-2014 were 83% and 88% respectively. Moreover, for 2008-2009 intake, 33% of the students graduated within 5-6 years. Similarly, the average study period for 2009-2010 and 2010-2011 are within 5-6 years. During interview sessions, the Panel was advised that the longer study period could be attributed to the fact that many students are in full-time employment and study an average of 12-15 credits per trimester. According to the Alumni Report, 69% of the graduates of the BSME programme who graduated in the last two years, are employed in related disciplines and the remaining are employed in other fields of practice or types of activities. Nonetheless, the Panel notes that, based on the viewed evidence and discussions during the site visit, a high percentage of students are departing the programme, especially between the first-second year (30%) and second-third year (25%). The Panel is of the view that these are high attrition rates compared to similar programmes internationally. The Panel recommends that the College conduct a formal study to investigate the reasons for the high attrition rate and develop a plan to mitigate these.
- 3.10 The BSME programme has an 'Industrial Attachment' course in the second trimester of the fourth year and it has six credit units. Moreover, the course is compulsory and requires a prerequisite of fourth year standing. AMAIU has a WBL policy, which details the guidelines for the assessment of work-based learning. As noted earlier, the policy defines the role and responsibilities of the student, the training supervisor and course coordinator as well as the deployment and assessment of WBL. The student is assessed on the submission of an Industrial Attachment Accomplishment Report, progress reports and performance evaluation, which are conducted by the training supervisor. The Panel confirmed during the site visit and from the evidence that the assessment policy is implemented consistently. Moreover, students and alumni indicated that the 'Industrial Attachment' course has provided them with valuable skills that have assisted them with their current jobs or in gaining employment. Moreover, the companies that provide industrial attachment gave positive feedback of the students and the course during the interviews. The Panel notes with appreciation the implemented measures by the College for the management and assessment of work based learning. However, the Panel notes that a member of the Placement Linkage and Alumni Office (PLAO), who is a member of the administration staff and does not have an engineering background, conducts on-site visits to monitor

the student activities on site. The Panel is of the view that academic faculty members should be involved in the on-site mentoring and evaluation of the students as it is an academic element of the course. Likewise, the Panel suggests that the College arranges for the training and orientation of the Practicum Supervisor on completing the relevant parts of the student evaluation as these parts are worth 70% of the final course mark. The Panel recommends revising the WBL policy to include the role of faculty members in all aspects of its management to ensure quality and consistency of the industrial supervision and assessment.

- 3.11 The BSME programme has two design project courses in the final revision of the programme's syllabus, 'Mechatronics Engineering Design Project A and B'. Students work in groups of 2-3 and select a project that relates to the company that employs them, in case they are employed, or a research based project to develop an engineering system that solves a defined problem. The University Research Guidelines are implemented such that a design course supervisor is assigned to each group of project students. These guidelines and the anti-plagiarism guidelines govern the writing of the project reports. Project students are evaluated through progress monitoring forms, a group project report and a working prototype. An examination panel conducts the assessment, where the Research Guidelines stipulate the grade distribution, as follows; final report 30%, prototype 30% and oral presentation 40%. During the site visit, the Panel reviewed some of these projects and their prototypes and learned from the faculty and students that a number of these projects were developed as research projects. Some of the groups took their designed prototypes even further to compete at engineering design competitions. Other projects have been expanded, by the faculty and students, into long-term research projects that have resulted in the publishing of their findings in scientific journals and conferences. The Panel notes that the course contents and the scope of the design projects are appropriate and provide a good combination of analytical knowledge, experiential learning and design skills. The Panel appreciates the level of learning that the students receive in the two design project courses and the sound documentation that is used to monitor and report the results of the design projects.
- 3.12 The BSME programme has a Programme Industry Advisory Panel (PIAP) that works with defined terms of reference, mandates and roles to support the programme and the College of Engineering in general. The PIAP is composed of five members, including three members from industry, one member from a professional organisation and one alumnus. The PIAP meets regularly twice a year in March and September and all of the programme faculty, including the Programme Head and the Dean attend the meetings. Minutes were taken for all of the PIAP meetings, which record the main discussions, decisions and suggestions. From the minutes of meetings and the material examined by the Panel, it was clear that the PIAP members have the relevant industry experience appropriate for the programme needs and are completely engaged with

the BSME programme. Viewed evidence revealed that the PIAP's feedback and suggestions had an influence on the programme decision making, and that the members participated in developing and approving the PILOs for the BSME programme. During interview sessions, the Panel learned that the PIAP works closely with the College and the University to help provide advice on the development and improvement of the college's laboratories. Furthermore, the members of the PIAP showed great enthusiasm and support for the programme, which they indicated that it would assist Bahrain's industry, as it is a unique programme within the region. The Panel appreciates the PIAP members' engagement in the BSME programme development through their feedback, enthusiasm and their dedication in supporting the BSME programme and the College of Engineering.

- 3.13 The BSME programme and the College conduct alumni and employer surveys to gauge the satisfaction of the stakeholders with the graduates' profile. The alumni survey contains three sections: general information, assessment of the PEOs and the experience of the alumni with the academic programme and the College of Engineering facilities. The employer survey includes two sections: general information about the person filling the survey and their experience with the graduates of the programme. The Panel viewed the surveys' questions as well as the results and is satisfied that they are regularly conducted. The results show that alumni are satisfied with the education they gained from the BSME, with a weighted mean of 4.19 and 4.02 out of 5 for the surveys conducted in 2013-2014 and 2014-2015, respectively. The results of the employer satisfaction for the BSME batch of 2012-2013 graduates show a weighted mean of 4.2 out of 5. During meetings with alumni and employers, both groups conveyed their satisfaction with the programme and the standards of graduate profile. Furthermore, PIAP members support the employability skills that graduates gain from the programme. Based on the interviews and the reviewed evidence, the Panel notes with appreciation that stakeholders are satisfied with the standards of the graduates of the BSME programme and the university's efforts to support the learning environment.
- 3.14 In coming to its conclusion regarding the Academic Standards of the Graduates, the Panel notes, *with appreciation*, the following:
- There are clear graduate attributes, which are stated as programme educational objectives, and are linked to the programme intended learning outcomes.
 - There is a formal mechanism in place for internal moderation that contributes to the review and improvement of the programme courses.
 - There are well implemented measures for the management and assessment of work based learning.
 - There are clear policies and procedures that are implemented for managing the design projects that ensure a suitable level of learning that the students receive in the two design project courses.

- There is a functioning and actively engaged programme industrial advisory panel that supports the BSME programme.
- The alumni and employers of the BSME programme are satisfied with the standard of the programme and its graduates.

3.15 In terms of improvement, the Panel **recommends** that the College should:

- formalise the benchmarking process and expand its scope beyond the course level, as stated in the university's existing benchmarking policy, as well as to consider the passing mark during the benchmarking activities
- develop a mechanism to systematically monitor the implementation of the improvement plans on assessment
- conduct a formal study to investigate the reason for the high attrition rates and develop a plan to mitigate these
- revise the Work Based Learning policy to include the role of faculty members in all aspects of its management.

3.16 **Judgement**

On balance, the Panel concludes that the programme **satisfies** the Indicator on **Academic Standards of the Graduates**.

4 Indicator 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.

- 4.1 There is a suite of institutional policies and procedures that are available to staff, faculty and students through a set of handbooks, such as the Student Handbook; Faculty and Employees Manual; Academic Policies and Procedures Handbook; and Policies and Procedures Manual. The 'Policy and Procedures on Review and Approval of University Policies' is in place for the management of these policies and procedures. Primary responsibility for monitoring the implementation of the university's policies and procedures rests with the QAAO, while the implementation is carried out by the college's CQI Committee and overseen by the Dean and the Programme Head. The Panel is of the view that the nature and scope of these policies, and their implementation and oversight, are in general sufficient. In terms of the communication of these policies and procedures to staff, evidence of mechanisms for this was provided, for example, workshops that were held on this topic, and faculty were found to be generally aware of what is expected of them in the QA process on the course level. Nonetheless, during interviews, the Panel noted that the faculty were not involved in the development of the policies and procedures and the QA process beyond the course level, as elaborated below. The Panel notes the availability of institutional policies and regulations and the mechanisms for communicating them to the staff, which are adequate for the needs of the programme and encourages the College to further involve the faculty members in the development and improvement of these policies and procedures.
- 4.2 The management of the programme takes place through a reporting line that starts from the Programme Head, to the Dean and up to the Provost. Under the Programme Head, there are both Specialisation Coordinators and Course Coordinators, who relate more directly to concerns related to the course delivery. During interviews, the Panel noted the limited involvement of the Dean in the management of the College, where rather direct academic responsibility and authority is exerted by the university's higher management in connection with programme management. Similarly, the involvement of Programme Head is in question, on matters of details pertaining to the overall programme quality assurance, even though the programme management appears to be done in a clear way and one in which the expected standards are articulated and monitored. Moreover, faculty involvement in the QA process seemed to be limited at the course level only. The Panel therefore recommends that the programme team should increase its role and level of leadership in the programme maintenance, with the important aim of increasing the faculty members' ownership of the quality of the programme as a whole and its delivery.

- 4.3 AMAIU has an institutional Quality Manual, and a Quality Assurance and Accreditation Office established to monitor the programme's compliance with these procedures. The College compose its college development plan and faculty development plan as part of this system, and has a CQI committee that monitors programme quality assurance. The Panel notes the existence of several committees that are involved in the QA and management of the programme, such as the College Council, the Academic Council, as well as faculty meetings with the programme managers. Furthermore, the analysis of PILOs for the programme is done annually, using not only CILOs and maps of these to the programme level (which were provided in the course portfolios), but input from external stakeholders (primarily through the PIAP). The Panel notes that while examples of programme improvement were given during the visit, such as the introduction of more fuzzy control into one course as well as other changes necessitated by ABET requirements, it was less clear how these may have emanated directly from the quality assurance process described to the Panel. The Panel recommends that the College should evaluate the effectiveness of its quality assurance mechanisms to ensure systematic programme improvements.
- 4.4 AMAIU as well as the College of Engineering conduct workshops and faculty development activities to deepen knowledge of QA processes, and interviewed faculty members seemed generally aware of how their work on the course level fed into programme QA processes. However, during meetings, the Panel noted that despite the relative clarity on procedures to be followed with respect to their own courses in quality assurance and outcome assessment, faculty members seemed less clear (and perhaps, not highly involved) on the integration of the course level results and improvements into the programme as a whole. As stated in paragraph 4.2, the Panel is of the view that programme faculty members should be encouraged to broaden their QA knowledge and involvement beyond their own courses to include more holistic consideration of the overall programme quality.
- 4.5 The University has a published policy on the development of new programmes, and according to the SER, the College Review Committee has the responsibility for assessing the need for introducing a new programme. The process includes market needs assessment, analysis of the competition and risk, as well as the potential demand amongst prospective students. The Panel is of the view that the provided policy includes appropriate consideration of relevance to institutional mission, a proper market analysis, and subject to the QA procedures already established. During interviews, the Panel was informed that this policy has been followed recently for a new application for a programme in environmental engineering, which is currently under consideration by the HEC. The Panel viewed evidence of the College conducting several activities as part of the programme development process, which are generally in line with its policy on the development of new programmes. The Panel

acknowledges that there is an appropriate policy for the development of new programmes, which has been implemented.

- 4.6 According to the SER, there is a policy for Programme Development, Review and Enhancement which is implemented by the College. The primary mechanism for this is the annual Self-Evaluation Survey on the programme level. The Panel viewed evidence of recent efforts for improvements on the course level, utilising the input of appropriate specialisation and course coordinators and was able to confirm this utilisation through detailed examples of course level outcome reports that were provided. During interviews, the Panel was informed that the recommendations for course revisions are first developed amongst the Programme Head and the appropriate coordinators, and then taken forward to the College Council, as appropriate. The Panel appreciates that annual internal programme review takes place and recommendations for improvement are generated and utilised to inform programme improvement.
- 4.7 The Programme Development, Review and Enhancement policy is in place for conducting periodic reviews of the programme; the scope for such reviews is comprehensive and includes admission, learning resources, market demands as well as curricular detail. The SER states that the expected cycle for programme review is 3-5 years; while during interview sessions the Panel was informed that this cycle is 4 years. The Panel viewed evidence of the programme enhancement and review process as depicted in the programme review summary report conducted in 2010-2013 and notes that the procedure for programme review relies heavily on feedback from PIAP. Nonetheless, there is no clear mechanism for incorporating the feedback from other stakeholders (in the form of surveys, like the senior exit survey or alumni survey) in the periodic review process of the programme. The Panel notes that, in general, both internal and external mechanisms, which are stated in the policy for periodic reviews of the programme, have been used to make improvements, but a systematic and consistent approach is not evident (See paragraph 4.3).
- 4.8 The SER indicates that the College implements course evaluation surveys, senior exit surveys, alumni surveys, employer surveys, student satisfaction surveys and employee surveys. The Panel was provided with examples of all these surveys, and the analysis results for most. During interviews, staff were able to clarify to the Panel how mechanisms are put in place for improvements, such as the course level surveys and exit surveys being used in the PILOs review on the programme level. The strongest mechanism, however, for such structured feedback appeared to be through the biannual meetings of the PIAP. During interviews, the Panel noted that PIAP members were well aware of the laboratory and curricular improvements that had been made and had specific suggestions about many of them, and they confirmed that their most formal feedback provided was received and acted upon by the College. The

Panel acknowledges that there are structured feedback collection systems but notes that there is no evidence of systematic and consistent approach in using feedback from all stakeholders to effect programme improvements (See paragraph 4.3).

- 4.9 The College has a Faculty Development Plan (FDP) and documentation was provided of a sample of an individual faculty development plan, where these individual faculty development plans are collated by the Dean and used to form the College plan. According to the SER, staff Professional Development (PD) focuses on their individual needs in teaching, research, community engagement, quality assurance and accreditation. Faculty submit their PD plans to the Programme Head who summarises them and forwards them to the Dean. Furthermore, financial support is provided to encourage research, conference attendance and membership of professional bodies. Moreover, the University facilitates internal and external staff development activities for faculty and support staff. During interviews, the Panel explored the effectiveness of PD arrangements extensively with the faculty and several indicated that they had attended professional meetings either as contributors, such as research contributions, or as PD opportunities, and that separate budgets are available for both. The Panel appreciates the staff PD system in place, which is functional and provides faculty with the growth opportunities that they need to improve their capabilities and overall programme delivery.
- 4.10 According to the SER the policy on programme development, review and enhancement stipulates that potential labour market needs and current trends in the engineering sector are incorporated in programme review. The programme supplements the available sector market studies, such as Tamkeen's reports and the HEC's report on Industry and Employer Graduate Skills Requirement, and the recent university-commissioned study by a formal consulting firm with the feedback gained through biannual meetings of its own PIAP to stay connected to the labour market and its needs. During interviews, the Panel was informed that the PIAP provide feedback on market needs, which is acted upon by the College, and stakeholder confirmed that the BSME programme meets a strong market need in Bahrain associated with automation of manufacturing and industrial processes. The Panel appreciates that the university conducted a formal study to scope labour market needs.
- 4.11 In coming to its conclusion regarding the Effectiveness of Quality Management and Assurance, the Panel notes, *with appreciation*, the following:
- There is an annual internal programme review that informs the implementation of recommendations for improvement.
 - There is a staff professional development system, which is functional and provides faculty with the growth opportunities.
 - There is a formal study conducted by the University to scope labour market needs.

4.12 In terms of improvement, the Panel **recommends** that the College should:

- increase the role of programme leadership, and its level of leadership, in the programme maintenance, with the important aim of increasing the faculty members' ownership of the quality of the programme as a whole and its delivery
- evaluate the effectiveness of the quality assurance mechanisms to ensure systematic programme improvements.

4.13 **Judgement**

On balance, the Panel concludes that the programme **satisfies** the Indicator on **Effectiveness of Quality Management and Assurance**.

5 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/QQA *Programmes-within-College Reviews Handbook, 2014*:

There is limited confidence in the Bachelor of Science in Mechatronics Engineering of the College of Engineering offered by the AMA International University.