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ENGINEERING PROGRAMME ACCREDITATION STANDARD 2024

Engineering Accreditation Council
Board of Engineers Malaysia

9th Floor, Kelana Parkview Tower, No. 1, Jalan SS 6/2 Kelana Jaya,
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Notes on the period for which this Standard takes effect

1. **Accreditation is accorded based on students' graduation years, not their intake years.**

2. **IHL's are encouraged to adopt this Standard immediately into their respective programmes. However, any new provision or change to any existing provision in this Standard will be effective from 1st January 2025 and will apply to all student cohorts from Year 1 to Year 4.**

3. **Where programmes require time to adopt to any change, EAC will allow adequate time for a reasonable transition to take place as justified by the Programme.**

4. **In improving this Standard continuingly, the intention of EAC is to accord the benefits to all students as soon as practically possible.**

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Acknowledgements

The Engineering Accreditation Council (EAC) would like to acknowledge the contributions by various individuals and organisations in drawing up this Standard which has gone through several revisions. Their service to the EAC is highly appreciated.

Engineering Accreditation Council (EAC)
Board of Engineers Malaysia (BEM)

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Definitions

Glossary

BEM	-	Board of Engineers Malaysia
CEA	-	Complex Engineering Activities
CEO	-	Chief Executive Officer
CEP	-	Complex Engineering Problem
CQI	-	Continual Quality Improvement
CO	-	Course Outcomes
CEng	-	Chartered Engineer
DL	-	Dependent Learning
EA	-	Complex Engineering Activities
EAC	-	Engineering Accreditation Council
EAD	-	Engineering Accreditation Department
EAMS	-	Engineering Accreditation Management System
EE	-	External Examiner
ELT	-	Effective Learning Time
FTE	-	Full-Time Equivalent
FYP	-	Final Year Project
HoP	-	Head of Panel
HoD	-	Head of Delegation
IAP	-	Industry Advisory Panel
IEM	-	The Institution of Engineers, Malaysia
IDP	-	Integrated Design Project

IL	-	Independent Learning
IG	-	Industrial Guidance
IT	-	Industrial Training
IHL	-	Institutions of Higher Learning (include public or private universities, and other institutions authorised by legislation to award engineering degrees)
ISO	-	International Standard Organization
JPA	-	Jabatan Perkhidmatan Awam (Public Services Department)
MQA	-	Malaysian Qualifications Agency
MQR	-	Malaysian Qualifications Register
MoHE	-	Ministry of Higher Education
MoM	-	Minutes of Meeting
OFI	-	Opportunity for Improvement
OBE	-	Outcome-Based Education (an approach that focuses on outcomes)
PE	-	Professional Engineer
PEO	-	Programme Educational Objectives
PO	-	Programme Outcomes
QMS	-	Quality Management System
RFC	-	Request for Clarification
RFI	-	Request for Information
SAR	-	Self-Assessment Report
STPM	-	Sijil Tinggi Persekolahan Malaysia (Malaysian Higher School Certificate)
SLT	-	Student Learning Time

SOP	-	Standard Operating Procedures
ToR	-	Terms of Reference
WA	-	Washington Accord
WBL	-	Work Based Learning
WK	-	Washington Accord Knowledge & Attribute Profile
WP	-	Washington Accord Problem Identification & Solving

General

Accreditation Appeals Board	-	A Board to consider appeals from an Institution of Higher Learning on EAC decision.
Evaluation Panel	-	A panel of evaluators appointed by EAC to evaluate an engineering programme for compliance with accreditation criteria.
Evaluator	-	A person appointed by EAC to evaluate Application for Approval to Conduct a New Degree Programme or evaluate a programme for accreditation or to evaluate a continuing/interim accreditation.
Graduate Engineer	-	A person registered under Section 10(1a), Registration of Engineers Act 1967 (Revised 2015).
Head of Delegation	-	An Associate Director of EAD/Senior Evaluator/any suitable representative appointed by EAC to advise the Evaluation Panel during an accreditation visit.
Professional Engineer	-	A person registered under Section 10(2), Registration of Engineers Act 1967 (Revised 2015).

Institutions of Higher Learning and Programme

Academic staff	-	Staff responsible for teaching and learning activities in the programme leading to the award of an engineering degree.
Course	-	Subject offered in the programme.
Degree	-	Bachelor of engineering programme leading to engineering qualification in Malaysia.
External Examiner/Advisor	-	A person with high academic standing in relevant field appointed by the IHL to assess overall academic programme and quality.
Faculty/School/ Department	-	The entity which is responsible for designing and conducting the programme to be accredited.
Graduate	-	Anyone who has been conferred a degree.
Industry Advisory Panel	-	A group of professionals with industrial experience in related areas appointed by the IHL for advisory role.
Programme	-	The sequence of structured educational experience undertaken by students leading to completion, on satisfactory assessment of performance.
Stakeholders	-	Parties having interests (direct or indirect) in the programme output, for example, employers, sponsors, lecturers and students.
Student	-	Anyone undertaking an undergraduate programme.
Support staff	-	Staff responsible for supporting teaching, learning and administrative activities in programme implementation.

Accreditation		
Accredited Programme	-	An engineering programme whose graduates are acceptable for graduate registration with the BEM. This is accorded to a programme that satisfies the minimum standard for accreditation set by EAC.
Accreditation with Interim condition	-	A programme given some conditions to be fulfilled within certain period of time which is shorter than the accorded accreditation period.
Accreditation Cycle	-	An accreditation cycle is the number of years of accreditation accorded to a particular programme where the maximum period is six (6) years. Each cycle is considered as a new cycle.
Approval	-	Permission from the relevant authorities to conduct a new programme.
Cessation/ Termination of Accreditation	-	EAC reserves the right to cease/terminate the accreditation if there is non-compliance or breach of accreditation requirements after accreditation has been given.
Continuing Accreditation	-	For a programme that was accorded accreditation less than six (6) years, EAC may accord the remaining number of years of accreditation to the programme subject to application by IHL and re-evaluation by EAC.
Deferred Accreditation	-	This is a status given to a programme observed to have weakness. This programme is given the opportunity to provide for corrective actions within a year from the date of deferment or from the date as determined by EAC.
Declined Accreditation	-	This is the status of a programme that fails to meet the minimum standard for accreditation. In such a case, a further application is not normally considered within the next one year.
Provisional Accreditation	-	This is given to a programme that has been recommended for approval to be conducted by EAC.

ENGINEERING PROGRAMME ACCREDITATION STANDARD 2024

Engineering Accreditation Council
Board of Engineers Malaysia

1.0 Introduction

The Board of Engineers Malaysia (BEM) registers inspector of works, engineering technologists, graduate engineers and professional engineers under the Registration of Engineers Act 1967 (Revised 2015). The pre-requisite for registration of inspector of works, engineering technologists and graduate engineers is a relevant qualification in engineering recognised by the BEM.

The BEM has a duty to ensure that the quality of engineering, engineering technology, and engineering technician education programmes of its registered engineers, engineering technologists and engineering technicians/inspector of works attain the minimum standard comparable to global practice. Hence the necessity to accredit engineering, engineering technology and engineering technician education programmes conducted in Institutions of Higher Learning (IHL).

The Engineering Accreditation Council (EAC) is the body delegated by the BEM for accreditation of engineering degrees. The EAC consists of representatives of the BEM, The Institution of Engineers, Malaysia (IEM), Malaysian Qualifications Agency (MQA) and the Public Services Department (Jabatan Perkhidmatan Awam Malaysia (JPA)). The Terms of Reference (ToR) of the EAC are outlined in Appendix A (Engineering Accreditation Council, Evaluation Panel and Accreditation Appeals Board).

This Standard outlines details for accreditation of an engineering programme in Malaysia. It serves to facilitate IHL to meet the minimum standard stipulated for the accreditation of their existing engineering programmes and proposed new programmes.

This Standard includes elements of outcomes in the engineering programmes to ensure a Continual Quality Improvement (CQI) culture in line with Outcome-Based Education (OBE) approach.

2.0 Accreditation Objective

The objective of accreditation is to ensure that graduates of the accredited engineering programmes satisfy the minimum academic requirements for registration as a graduate engineer with the BEM.

In addition, the objective of accreditation is to ensure that Continual Quality Improvement (CQI) is being practiced by IHL. Accreditation may also serve as a tool to benchmark engineering programmes offered by IHL in Malaysia.

3.0 Engineering

Engineering is creative and innovative application of scientific principles to design or develop structures, machines, apparatus, or manufacturing processes, systems or works utilizing them singly or in combination; or to construct or operate the same with full cognizance of their design; or to forecast their behaviour under specific operating conditions; all as respects an intended function, economics of operation, sustainability, health and safety to life and property.

4.0 Programme Educational Objectives (PEO)

Programme Educational Objectives (PEO) are specific goals consistent with the vision and mission of the IHL, responsive to the expressed interest of the programme stakeholders, and describe the expected achievements of graduates in their career and professional life a few years (such as three (3) to five (5) years) after graduation.

5.0 Programme Outcomes (PO)

Programme Outcomes (PO) are statements that describe what students are expected to know and be able to perform or attain by the time of graduation. These relate to the skills, knowledge, and behaviour that students acquire through the programme.

Students of an engineering programme are expected to attain the following PO:

i. **Engineering Knowledge** - Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in WK1 to WK4 respectively to develop solutions to complex engineering problems

ii. **Problem Analysis** - Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development (WK1 to WK4)

iii. **Design/Development of Solutions** - Design creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required (WK5);

iv. **Investigation** - Conduct investigation of complex engineering problems using research methods including research-based knowledge, including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions (WK8);

v. **Tool Usage** - Create, select and apply, and recognize limitation of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, (WK2 and WK6);

vi. **The Engineer and the World** - Analyze and evaluate sustainable development impacts to: society, the economy, sustainability, health and safety, legal frameworks, and the environment, in solving complex engineering problems (WK1, WK5, and WK7)

vii. **Ethics** - Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion (WK9);

viii. **Individual and Collaborative Team Work** - Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multidisciplinary, face-to-face, remote and distributed settings (WK9);

ix. **Communication** - Communicate effectively and inclusively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences;

x. **Project Management and Finance** - Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects in multidisciplinary environments;

xi. **Life Long Learning** - Recognise the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change (WK8).

The range of **Complex Engineering Problem (CEP)** and **Complex Engineering Activities (CEA)** are given in Appendix B:

- Section (d) Definition of Complex Engineering Problem (CEP);
- Section (e) Definition of Complex Engineering Activities (CEA); and
- Section (f) Washington Accord Knowledge & Attribute Profile (WK).

An Engineering programme for which accreditation is sought must respond to the following:

i. **Programme Outcomes (PO)**: The IHL/faculty shall have published PO that have been formulated considering items i. to xi. given above, and any added outcome that can contribute to the achievement of its stated PEO.

ii. **Processes & Results:** All PO shall be considered in designing the curriculum. The attainment of the POs must be adequately assessed, and used for improvements at course and programme levels.

iii. **Stakeholders' Involvement**: The IHL/faculty shall provide evidence of stakeholders' involvement with regard to Programme Outcomes (PO) and Processes & Results as above.

***Note**: Please refer to Guidelines for Evaluation Panel (Appendix H) for further elaboration of the expectation with regards to this section.*

6.0 Accreditation Policy

This section outlines the EAC's accreditation policy underlying the accreditation process. Accreditation shall be considered upon a written request from the IHL. An accredited programme by the EAC is the prerequisite for a graduate to register with the BEM.

6.1 The Accreditation Process

Accreditation of engineering programmes is undertaken by the EAC at the request of the IHL.

The EAC's accreditation process will focus on outcomes and the internal systems developed by the IHL to ensure that the graduates are adequately prepared to enter the engineering profession.

The process also involves determining the effectiveness of the quality assurance systems and procedures that ensure graduates are adequately prepared to practise engineering.

6.2 The Accreditation Cycle

An accreditation cycle is the number of years of accreditation accorded to a particular programme where the maximum period is six (6) years. In each cycle there is a maximum of two (2) accreditation visits.

The IHL shall apply for accreditation not less than six (6) months before expiry of the accreditation period.

6.3 Programmes

An IHL may offer programme/s via various pathways at the main campus or at different locations, such as full-time, franchised, twinning, part-time, distance learning, joint degree, multi-campus etc. It is advisable that the various pathways are disclosed in the award of the degrees, either on the degree certificate or academic transcripts. For each of the pathways, the IHL shall apply for accreditation separately.

If different pathways for programmes from the same IHL that bear the same name are not disclosed on the degree certificate or academic transcripts, a single accreditation decision applies to all pathways, i.e. the accreditation decision of one pathway will affect the other pathways, and the weakest governs. A programme shall be evaluated based on the criteria stipulated in Section 8 of this Standard.

6.4 Application and Preparation for Accreditation Visit

The IHL shall make applications for (i) provisional accreditation, (ii) new programme accreditation and (iii) new cycle programme accreditation as per the requirements of Section 9 of the Standard to the EAC through MQA. Other applications such as Continuing Accreditation should be directed to EAC. Appendix F shows the Process Flow Chart for Application of Accreditation and Provisional Accreditation of Engineering Programmes.

The accreditation visit shall be deferred if the submitted documents are of unacceptable quality, or do not follow the required format of Section 9 of the Standard. In such a case, the IHL shall resubmit the application.

If the documents submitted followed the required format, but the contents are found to be inadequate, the IHL shall be required to provide further information, or clarification. If the IHL does not provide further information within a period of three (3) months upon request, the EAC may cancel the visit.

6.5 Accreditation Evaluation

An accreditation evaluation is conducted to verify that the programme under evaluation complies with the appropriate accreditation criteria in this Standard.

The evaluation exercise shall be conducted by an Evaluation Panel appointed by EAC (refer to Appendix A).

6.6 Accreditation Decision

Upon completion of the accreditation exercise, the EAC, based on the recommendation of the Evaluation Panel, may decide on one (1) of the following for the graduating cohorts:

i. To accord accreditation for six (6) years.
ii. To accord accreditation for a maximum of six (6) years with conditions.
iii. To defer accreditation. This is to allow the IHL to fulfil condition(s) that may be imposed by the EAC. In such a case, a resubmission shall be made within a year.
iv. To decline accreditation. In such a case, a further application is not normally considered within the next one (1) year.

Programmes with any WEAKNESSES shall be deferred or declined accreditation.

A further visit will be scheduled to verify the results of the remedial action(s), in an interim or continuing accreditation visit, if deemed necessary. If adjudged satisfactory, based on the recommendation of the Evaluator, the interim condition may be lifted for programmes with interim condition and the earlier accreditation award upheld, or the remaining period of the accreditation may be accorded by the EAC for continuing accreditation.

Failure to address the conditions may result in cessation of accreditation at the end of the stated period.

The EAC's decision shall be sent to MQA, with copies to IHL, JPA and IEM. The accreditation shall be accorded to a specific programme, including location and mode.

6.7 Revisions to an Accredited Programme

The IHL shall update the EAC and the MQA of major changes (such as, 30% or more of the curriculum from the last accredited decision, location, pathways, programme name, programme duration or any Malaysian Qualifications Register (MQR) requirements) that may impact an accredited programme. Failure to do so may cause the EAC to reconsider the accreditation decision awarded earlier. The EAC may then direct the IHL to apply for re-accreditation of the revised programme.

6.8 The Provisional Accreditation to Conduct a Programme

The IHL intending to conduct a new programme shall obtain approval from the relevant authorities.

The IHL shall submit the complete set of documents as specified in Section 9 of this Standard to the EAC through the MQA for programme evaluation. The recommendation from the EAC shall be forwarded to the relevant authorities. The evaluation exercise shall be conducted by the EAC.

When the documents are considered to be inadequate, the IHL shall be required to provide further information before an evaluation is carried out. If the required information is not provided within a period of three (3) months, it shall be deemed that the IHL no longer intends to conduct the programme.

6.9 Publication of Accreditation Status

EAC shall regularly update the list of provisionally accredited and accredited programmes on the EAC website.

6.10 Appeal Procedures

An IHL may appeal against a decision **TO DECLINE ACCREDITATION** made by EAC. The notice of appeal must be made in writing to MQA within 30 days upon receiving the decision from MQA, stating the basis of the appeal with all relevant documents.

The Accreditation Appeal Board shall consist of the President of BEM, the President of IEM and the CEO of MQA or their nominated representatives. The President of BEM or the nominated representative shall be the Chairman of the Accreditation Appeal Board.

If necessary, the Accreditation Appeal Board may appoint a Special Committee, comprising members who are experienced in the accreditation process, to consider an appeal. Any expenses incurred shall be borne by the IHL.

The decision of the Accreditation Appeal Board shall be forwarded to the IHL and MQA within three (3) months from the receipt of the complete documents. The decision of the Accreditation Appeal Board shall be final.

6.11 Confidentiality

Anyone who has access to any document or other information in connection with the accreditation exercise shall be treated as confidential.

6.12 Expenses

The IHL shall bear all the costs incurred in carrying out activities related to the accreditation of a programme.

6.13 Conflict of Interest (CoI)

Members of the EAC, the Evaluation Panels, the Head of Delegation (HoD), the Accreditation Appeal Board and the EAD Director/Associate Directors are expected to be constantly aware of any CoI. Members shall adhere to the Conflict of Interest Guidelines adopted by the EAC.

7.0 Accreditation Procedures

This section describes EAC's accreditation procedures from the process of application to the notification of accreditation result.

7.1 Accreditation Application

The IHL should make an application for programme accreditation to the MQA and the EAC as per the requirements of Section 8 of this Standard. Appendix F shows the process flow chart on the Application for Accreditation and Provisional Accreditation of Engineering Programmes.

For a new programme, the IHL should apply for accreditation at least **six (6) months** before the final examination of the first intake of students.

For a current accredited programme, the IHL should apply for re-accreditation at least **six (6) months** before the expiry date of the accreditation to avoid delay in graduates' registration with the BEM.

The IHL applying for accreditation shall ensure that complete information is forwarded to the EAC. If the information submitted is found to be insufficient, the IHL shall be required to provide further information before an accreditation visit can be scheduled. The application will be deemed to have been withdrawn, if the requested information is not submitted within a period of **three (3) months**.

A cut-off period for submission of application for programme accreditation by IHL is 12 months after graduation of any cohort, if the graduates are to be included in the accreditation decision.

7.2 Evaluation Panel Appointment

On submission of all required documents, an Evaluation Panel shall be appointed as per Appendix A of this Standard. Members of the Evaluation Panel are selected on the basis of their expertise and standing in a particular discipline of engineering. Representatives from both the industry and academia to be appointed because of the perspective and experience that each area of endeavour can bring to the assessment of a programme, and to the maintenance of high professional standards.

The EAC needs to ensure that not only high standards of academic teaching and achievement are being met, but also that the skills acquired and quality of graduates, are relevant to the practices and continued development of engineering.

The Evaluation Panel needs to be aware of the EAC policies on accreditation as outlined in Section 6 of this Standard. The Evaluation Panel will assess all the accreditation criteria set forth in this Standard. The assessment includes obtaining objective evidence from documents submitted by the IHL, interviews and observation.

The Guidelines for Evaluation Panel (Appendix H) are useful tools for ensuring that every important aspect of a degree programme and its delivery are assessed and reported on.

7.3 Scheduling of a Visit

A visit is arranged and coordinated by the EAD on appropriate dates suitable to both the Evaluation Panel and the IHL. The visit should be held promptly after the appointment of the Evaluation Panel. It is important that as far as possible, the agreed dates of visit are adhered to.

7.4 Pre-Accreditation Visit Meeting

The Evaluation Panel should meet at least **once** before the actual accreditation visit takes place to study and discuss submitted accreditation documents, and systematically identify any shortcomings. The Panel should strategically plan and/or request supplementary input from the IHL to fill the gaps. Any further information required should be communicated to the IHL through the EAD. The Pre-Accreditation Visit Meeting is in addition to the meeting on Day (-1) (refer to Guidelines for Evaluation Panel- Appendix H).

7.5 Accreditation Visit

The accreditation visit will normally be scheduled for a period of two (2) days. The overall conduct of the visit shall be managed by the EAD. A typical schedule of the visit is given in item 3 of Guidelines for Evaluation Panel of this Standard (Appendix H). The visit shall include but not be limited to the following:

i. Opening meeting with the IHL management and the programme administrators
ii. Reviewing relevant documents
iii. Meeting with staff members
iv. Meeting with students
v. Meeting with external stakeholders such as alumni, employers, and Industry Advisory Panel (IAP)
vi. Visiting and checking of facilities

vii. Exit meeting with the IHL management and programme administrators

Meetings with all stakeholders are important as this would give an indication of their involvement in the CQI process of the programme.

7.6 Report and Recommendation

The report, prepared in accordance with Evaluation Panel Report (Appendix D), by the Evaluation Panel shall be submitted to the EAD within four (4) weeks after the visit.

8.0 Qualifying Requirements and Accreditation Criteria

An engineering programme shall be assessed by the EAC to enable graduates of the programme to register as graduate engineers with the BEM. The assessment involves a review of qualifying requirements of the IHL and an evaluation based on the following criteria:

i. **Criterion 1 - Programme Educational Objectives (PEO)**
ii. **Criterion 2 - Programme Outcomes (PO)**
iii. **Criterion 3 - Academic Curriculum**
iv. **Criterion 4 - Students**
v. **Criterion 5 - Academic and Support Staff**
vi. **Criterion 6 - Facilities**
vii. **Criterion 7 - Quality Management Systems (QMS)**

The assessment process will involve two (2) parts:

i. Initial assessment of qualifying requirements.
ii. Detailed assessment of the programme based on the accreditation criteria.

The qualifying requirements are meant to screen out programmes that do not meet the core requirements of the assessment criteria.

Failure to meet any one (1) of the qualifying requirements will disqualify the programme from further assessment.

An engineering programme must have the eight (8) components of the qualifying requirements. These components are:

i. **A minimum of 135 Student Learning Time (SLT) credits of which 90 SLT credits must be engineering courses offered over a period of four (4) years.**

ii. **Integrated Design Project (IDP).**

iii. **Final Year Project (FYP) (minimum six (6) SLT credits).**

iv. **Industrial Training (minimum of eight (8) weeks).**

v. **Full-time academic staff (minimum of eight (8)) with at least three (3) Professional Engineers registered with the BEM or its equivalent.**

vi. **Academic Staff: student ratio 1: 20 or better.**

vii. **External Examiner/Advisor report. (one (1) in every two (2) years)**

viii. **Programme Educational Objectives (PEO) and Programme Outcomes (PO)**

Note:

- *For Provisional Accreditation application items v, vi and vii only require strong commitment from IHL.*
- *If the programme has met all the qualifying requirements, a detailed assessment of the programme based on the accreditation criteria as explained in the following sections will be carried out.*
- *Please refer to Guidelines for Evaluation Panel (Appendix H) for further elaboration of the expectation with regards to this section.*

8.1 Criterion 1: Programme Educational Objectives (PEO)

An engineering programme seeking accreditation shall have published PEO (Section 4.0). The PEO shall be the basis upon which the PO (Section 5.0) are formulated. The programme shall have a clear linkage between PEO and PO. It is expected that important stakeholders especially from the industries provide inputs in the process of formulating the PEO. There must be a documented and effective process, involving programme stakeholders, for the periodic review and revision of these PEO.

8.2 Criterion 2: Programme Outcomes (PO)

The quality and performance of students, in relation to the PO is of utmost importance in the evaluation of an engineering programme.

An Engineering programme for which accreditation is sought must respond to the following:

i. **Programme Outcomes (PO):** The IHL/faculty shall have published PO that have been formulated considering items i. to xii. given in Section 5.0, and any added outcome(s) that can contribute to the achievement of its stated PEO. The various PO shall be considered in designing the curriculum as described in Section 8.3 (Criterion 3 – Academic Curriculum).

ii. **Processes & Results:** All PO shall be considered in designing the curriculum. The attainment of the PO must be adequately assessed, and used for improvements at course and programme levels.

iii. **Stakeholders' Involvement:** The IHL/faculty shall provide evidence of stakeholders' involvement with regard to Programme Outcomes (PO) and Processes & Results as above.

Note:

Please refer to Guidelines for Evaluation Panel (Appendix H) for interpretation of requirements in this section.

8.3 Criterion 3: Academic Curriculum

The academic curriculum design shall strongly reflect the philosophy and approach adopted in the programme structure, and the choice of the teaching-learning (delivery) and assessment methods. The curricular approach, the educational content and the teaching-learning and assessment methods shall be appropriate to, consistent with, and support the attainment or achievement of the PO.

A balanced curriculum shall include all technical and non-technical attributes listed in the PO, and shall have the balance between the essential elements forming the core of the programme and additional specialist or optional studies (electives).

Guidelines on academic programme outlined in this Standard provide essential elements and features, which combined together will render a programme acceptable for accreditation by EAC.

All engineering programmes need to cover the broad areas of their respective branches with appropriate depth. Appendix B of this Standard provides list of most courses that the broad areas of the respective traditional programmes. The course structure and sequence of content shall be appropriate. Adequate time shall be allocated for each component of the content/course. Evidence shall be presented to show that the contents are being updated to keep up with scientific, technological and knowledge developments in the field, and to meet societal needs. IHL shall have mechanisms for regularly identifying topics of contemporary importance at local, national and global levels and topics that may not be adequately addressed in the curriculum.

Other contributing components to the curriculum such as a variety of teaching- learning (delivery) modes, assessment and evaluation methods shall be designed, planned and incorporated within the curriculum to enable students to effectively develop the range of intellectual and practical skills, as well as positive attitudes that are constructively aligned with the PEO and PO. The assessment to evaluate the degree of the achievement of the PO of the programme shall be done and its level of attainment recorded. The assessment of PO and the CO by the students may also be done both at the programme as well as at course levels, respectively. The teaching- learning methods shall enable students to take full responsibility for their own learning and prepare them for life-long learning. The programme shall demonstrate the relationship between the courses and the PO.

IHL need to consult the industry in keeping the content and outcomes up-to- date. However, they should not lose sight of the need to provide an education in engineering, which will form a sound basis for a career that is likely to see rapid changes in technology. As a general rule, it will be appropriate for the programme structure to be designed to give a progressive shift of emphasis from engineering science and principles in the early stages towards more integrated studies in the final year, in a way that will impart knowledge of application of fundamentals and provide a focus for a professional approach.

Flexibility and innovativeness are encouraged in the design of engineering courses in a programme. However, the IHL is required to demonstrate that minimum levels of understanding and standards of achievement of the outcomes are attained in engineering fundamentals relevant to the field.

The academic programme component must consist of a minimum total **135 SLT credits** (not including credits for remedial courses) normally based on a 14- weeks of teaching semester, made up as follows:

i. A **minimum of 90 SLT credits** shall be **engineering courses** consisting of engineering sciences and engineering design/projects appropriate to the student's field of study.

ii. The **remaining SLT credits** shall include sufficient content of **general education component** (such as natural sciences, mathematics, computing, languages, general studies, co-curriculum, management, law, accountancy, economics, social sciences, etc.) that complements the technical contents of the curriculum.

The essential elements and features are identified for convenience under several headings, without implying that each is to be treated as a separate or isolated component. In general, the syllabus and curriculum content must be adequate in quality and quantity in terms of coverage and depth. Emphasis on the curriculum shall be placed on the understanding and acquisition of basic principles and skills of a branch, rather than memorisation of details and facts. The curriculum shall also provide students with ample opportunities for analytical, critical, constructive, creative thinking, and evidence-based decision making in dealing with complex engineering problems. The curriculum shall include sufficient elements for training students in rational thinking and research methods.

Typical core contents for selected traditional engineering branches are shown in Appendix B of this Standard. The curriculum shall encompass the **Complex Problem Identification and Solving, Complex Engineering Activities** and **Knowledge & Attribute Profile,** as summarised in Sections (d), (e), and (f) in the same Appendix.

8.3.1 Student Learning Time (SLT) Credit

The SLT credit is based on the Student Learning Time as defined in the Malaysian Qualifications Framework (MQF). The SLT defines that for every one (1) credit specified, students need to spend 40 hours of learning. This was determined by considering the total amount of time available in a week, the time needed for personal matters, the time for rest and recreational activities, and the time for studying. For a course of three (3) SLT credits, students will have to spend 120 hours, which involves both face-to-face and non-face-to-face teaching, learning and assessment activities. The programme shall calculate the SLT credits based on the time students spent in the lecture, tutorial, laboratory sessions, design projects, problem-based learning, e-learning modules, discovery learning, coursework, projects, independent study, assessments and other relevant activities.

A Final Year Project (FYP) is subject to a minimum of six (6) SLT credits and a maximum of 12 SLT credits.

For Industrial Training, the requirements of a programme can be fulfilled in two (2) approaches: the conventional and/or the Work-Based Learning (WBL).

Industrial Training shall be for a minimum of eight (8) weeks subject to a maximum of six (6) SLT credits.

The industrial training must be conducted before the final semester.

8.3.2 SLT credit calculation for conventional Industrial Training (Please refer to 8.3.8)

One (1) credit is allocated for every two (2) weeks of training.

8.3.3 SLT credit calculation for WBL courses (Please refer to 8.3.6)

WBL: The total student learning hours allocated at the workplace must include the following elements:

i. Dependent Learning (DL),

ii. Independent Learning (IL),

iii. Industrial Guidance (IG), and

iv. Assessment (A)

The concept of Effective Learning Time (ELT) shall be given consideration in calculating the SLT credits for WBL. It is estimated that about 80% of the time at work can be determined as ELT. Due to those considerations, SLT for WBL is calculated as described below:

$$\boldsymbol{ELT = (DL + IL + IG) \times 80\%}$$

$$\boldsymbol{SLT\ Credits = \frac{ELT}{40\ (Notional\ Hours)}}$$

For SLT credit calculation for WBL courses, the following guideline shall be followed:

- The total student learning hours allocated at the workplace is inclusive of the Dependent Learning (DL), Independent Learning (IL), Industrial Guidance (IG) and assessment hours. The concept of Effective Learning Time (ELT) shall be given consideration in calculating the SLT and credits for WBL. It is estimated that about 80% of the time at work can be determined as ELT and the remainder of 20% cannot be utilized for learning such as lunch breaks, socialising, work adjustments and travel time to work etc. Due to those considerations, SLT for WBL is calculated as described as above.

8.3.4 Tutorial

Tutorials may complement lectures and a session should preferably not exceed 30 students at any one (1) time.

8.3.5 Laboratory Work

Students should receive sufficient laboratory work to complement and reinforce engineering theory. The laboratory work also helps to develop students' practical competence. Students should work in groups, preferably not more than five (5) in a group. It is expected that a significant number of laboratory works shall be open-ended.

Throughout the programme, there should be adequate provision for laboratory or similar investigative work, which will develop in the future engineer the confidence to deal with complex engineering problems.

8.3.6 Work-Based Learning (WBL)

WBL is one (1) of the industrial training approaches that provides students with real life work experiences in an engineering environment. It is essential that the work environment support the attainment of the learning outcomes. WBL is an alternative teaching and learning approach which can complement the conventional in campus delivery.

The WBL course design integrates theory and industrial practices in the workplace. WBL courses consist of four (4) components: Dependent Learning (DL), Independent Learning (IL), Industrial Guidance (IG), and Assessment all of which contribute to ELT and credits calculation.

8.3.7 Exposure to Engineering Practice

Exposure to engineering practice may also be obtained through a combination of the following:

i. lectures/talks by guest lecturers from industry;
ii. academic staff with industrial experience;
iii. courses on professional ethics and code of conduct;
iv. industry visits and/or industry exhibition;
v. industry-based project and/or industry related competition; and
vi. use of a logbook in which industrial experiences are recorded.

8.3.8 Industrial Training

Industrial training shall be structured, supervised by appropriate personnel and adequately assessed.

Training in engineering practice will provide first-hand experience in an engineering-practice environment, outside the IHL. Familiarity with all common engineering processes is essential and exposure at a practical level to a wide variety of processes is required at a level appropriate to the students

The central aim is to acquire practical know how in carrying out complex engineering activities.

8.3.9 Final Year Project (FYP)

The Final Year Project (FYP) should preferably be industry related, and can provide one of the best means of introducing an investigative research-oriented approach to engineering studies.

The FYP should include problem identification, analysis, judgement and decision making. The student is expected to develop techniques in literature review, investigation and information processing. Use of tools and technologies are expected. FYP must be an individual assessment.

8.3.10 Integrated Design Projects (IDP)

Integrated Design Projects (IDP) shall involve complex engineering problems and design systems, components or processes integrating (culminating) core areas and meeting specified needs with appropriate consideration for public health and safety, cultural, societal, project management, economy, and sustainability considerations.

The IDP is a multifaceted assignment that serves as a culminating academic and intellectual experience for students. The IDP should be a team project.

8.3.11 Criteria for Passing Courses

The IHL must ensure that no students shall pass a course if they fail in their final examination of that course, unless the continuous assessment approach adopted can demonstrate the attainment of the depth of knowledge.

8.4 Criterion 4: Students

The quality and performance of students, in relation to the PO is of utmost importance in the evaluation of an engineering programme.

Students intending to pursue engineering programmes shall have a good understanding of mathematics and natural sciences. The normal entry qualification is Sijil Tinggi Persekolahan Malaysia (STPM) (with good principal passes in mathematics and natural sciences) or its equivalent.

IHL shall ensure that students, who do not meet the above criteria, undertake suitable remedial programmes in order to attain the equivalent entry qualification. IHL must put in place clear policies and mechanism for Credit Exemption/Transfer to allow alternative educational pathways.

Credit Exemption/Transfer may be done in two (2) categories as follows:

i. Credit and Course Exemption from lower to higher level, i.e. **accredited/recognised** Diploma to Bachelor degree. A maximum Credit and Course Exemption of 30% of the total programme credits is allowed.

ii. Credit Transfer between **accredited/recognised** programmes of same level, i.e. from Bachelor to Bachelor degree. A maximum Credit Transfer of 50% of the total programme credits is allowed.

Total credit exemption and transfer should not exceed 50%.

The programme shall provide the necessary teaching-learning environment to support the achievement of the PEO and PO. The teaching-learning environment shall be conducive to ensure that students are always enthusiastic and motivated. The IHL shall provide necessary counselling services to students regarding academic, career, financial, and health matters.

The programme should demonstrate the necessary avenues for students to get their feedback and suggestions on improving the programme such as committee, forum and feedback services.

Students shall not be over burdened with workload that may be beyond their ability to cope with. However, adequate opportunities, such as involvement in co-curricular activities in student clubs, competitions, sports and campus activities shall be provided for students to develop their character apart from academic development.

8.5 Criterion 5: Academic and Support Staff

A viable engineering programme is expected to have a minimum of eight (8) full-time academic staff relevant to the particular engineering branch. All eligible academic staff are register with the BEM. Every programme shall have a minimum of three (3) full-time Professional Engineers registered with the BEM or its equivalent and actively teach in the programme. For programmes with a total student enrolment exceeding 160, at least 30% of the actively teaching engineering academic staff shall be registered with the BEM as Professional Engineers or its equivalent.

In addition, the IHL may engage part-time staff with acceptable professional qualifications in the related engineering fields. Numbers of part time staff recruited shall not exceed 40% of the total staff.

Academic staff shall have postgraduate degrees (Masters level or higher). However, a staff member with a recognised first degree and long industrial/specialist experience with acceptable professional qualifications may be considered.

It must be demonstrated that the academic staff have the competencies to cover all areas of the programme, and are implementing the outcome-based approach to education. The overall competence of the academic staff may be judged by such factors as education, diversity of background, engineering experience, teaching experience, ability to communicate, enthusiasm for developing more effective programmes, level of scholarship, participation in professional societies and attainment of Professional Engineer status. The IHL should ensure its staff gain the necessary industrial experience required to achieve Professional Engineer status.

The Full-Time Equivalent (FTE) academic staff to student ratio should not exceed 1:20 to ensure effective teaching and learning, student-staff interaction, student advising and counselling, IHL service and research activities, professional development and interaction with the industry.

There shall also be sufficient, qualified and experienced technical and administrative staff to provide adequate support to the educational programme. It is recommended that each technical staff be in charge of not more than two (2) laboratories.

Sharing academic staff between programmes is allowed, and will count for staff to student ratio based on FTE guidelines. Part-time staff from industry is encouraged, and will count towards staff to student ratio calculations based on FTE guidelines.

8.6 Criterion 6: Facilities

The quality of the environment in which the programme is delivered is regarded as paramount to providing the educational experience necessary to accomplish the PO.

There must be adequate teaching and learning facilities such as classrooms, learning-support facilities, study areas, information resources (library), computing and information-technology systems, laboratories and workshops, and associated equipment to cater for multi-delivery modes.

Sufficient and appropriate experimental facilities must be available for students to gain substantial experience in understanding and operating engineering equipment and of designing and conducting experiments. The equipment must be reasonably representative of modern engineering practice. Where practical work is undertaken at another institution, or in industry, arrangements must be such as to provide reasonable accessibility and opportunity for learning. The IHL must ensure that all facilities are maintained and adhered to best practices and in compliance with applicable rules or regulations in occupational safety, health and environment.

For programmes offered partly in distance mode, or at multiple or remote locations, facilities must be sufficient to support student learning, equivalent to those provided for on-campus students.

Access to support facilities such as hostels, sport and recreational centres, health centres, student centres, and transport must be adequate to facilitate students' life on campus and to enhance character building.

8.7 Criterion 7: Quality Management Systems (QMS)

The IHL must ensure an effective quality management system is in place to oversee and monitor the overall achievement of the PEO and PO. The system must cover planning, development, delivery and review of engineering programmes, professional development and record of staff, admission and record of students.

8.7.1 Institutional Support, Operating Environment, and Financial Resources

The IHL must regard quality engineering education as a significant and long-term component of its activity. This would most commonly be reflected in the IHL's vision and mission statements and strategic plans. In addition, institutional support may be reflected in the leadership, adequate policies and mechanisms for attracting, appointing, retaining and rewarding well-qualified staff and providing for their ongoing professional development; and for providing and updating infrastructure and support services. It must ensure that constructive leadership is available to the IHL through the appointment of highly qualified and experienced senior staff in sufficient numbers.

The development of academic staff, in particular, through opportunities for further education, industrial exposure, as well as research and development, is of utmost importance for the sustainability and quality improvement of the programme.

Opportunities for the development of support staff should be provided. The IHL shall provide sound policies, adequate funding and infrastructure for this purpose. Financial resources must be adequate to assure the overall quality and continuity of the engineering programme. The IHL must have sufficient financial resources to acquire, maintain, and operate facilities and equipment appropriate for the engineering programme.

8.7.2 Programme Quality Management and Planning

The IHL's processes for programme planning, curriculum development, and regular curriculum and content review must involve all academic staff. The processes include reviewing PEO, PO, CO and their constructive alignment, tracking performance assessment processes, reviewing the comments from External Examiner/Advisor, and reviewing feedback and inputs from stakeholders including students and alumni.

The process of CQI shall be implemented with accountability. The IHL must demonstrate appropriate benchmarking is carried out with similar accredited/recognised programme(s) offered at other IHL.

For a new programme, the processes surrounding the decision to introduce the programme should be established.

Programme(s) via various pathways and at different locations, such as, full-time, franchised, twinning, part-time, joint programme and multi campus may be conducted upon approval by the EAC. The IHL awarding the degree shall be responsible for ensuring the quality and management of these programmes.

8.7.3 External Assessment and Advisory System

The IHL shall have an External Examiner/Advisor for each programme to independently review the overall academic standard as shown in Appendix E (External Examiner/Advisor Report) of this Standard.

The External Examiner/Advisor is a person of high academic standing in the relevant or engineering discipline and preferably with industry experience. The External Examiner/Advisor is expected to carry out the overall assessment of the programme including staff as well as all courses and laboratory work undertaken by the students. Assessment is to be made at least once every two (2) years.

The IHL shall have an Industry Advisory Panel (IAP) comprising practicing engineers, and employers of engineers, for the purpose of planning and continual improvement of programme quality. The IAP meeting must be conducted at least once a year.

The IAP should preferably participate on an on-going basis in academic activities such as discussion, forums, talks, guest lectures, etc.

The External Examiner/Advisor report and feedback from IAP shall be used for CQI.

8.7.4 Quality Assurance

A quality management system must be in place to assure the achievement of PO. The IHL shall maintain its quality management system, based on an established quality assurance standard, for example, ISO 9001 Quality Management System, or other quality assurance systems and benchmarking. The quality assurance processes should include, among others:

i. Student admission including credit and course transfer/exemption.

ii. Teaching and learning

iii. Assessment and evaluation which include:

- examination regulations and criteria for pass/fail
- preparation and moderation processes
- level of assessment
- assessment processes for all courses including Design Project and Final Year Project and Industrial Training

8.7.5 Safety, Health and Environment

The IHL shall demonstrate that it has in place, a system for managing and implementation of safety, health and environment. Safety practice is of utmost importance, and among a major factor affecting accreditation decision.

The IHL shall demonstrate activities to inculcate safety practice among the staff and students and comply with any or all applicable rules or regulations pertaining to safety, health and environment.

9.0 Accreditation Documents

9.1 Introduction

The IHL applying for accreditation must submit documents that provide accurate information and sufficient evidence for the purpose of evaluation to the EAC through the MQA.

For each application, unless otherwise stated, the IHL shall submit through the Accreditation Management System (AMS) the following documents:

i. Self-Assessment Report (SAR) (as noted in Section 9.2 of this Standard) – Digital Format.

ii. Supporting Documents (as noted in Appendix I of this Standard)

iii. Appendix C (Checklist of Documents for Accreditation/Provisional Accreditation).

Institutional documents and additional documentation (as noted in Section 9.4) are to be made available during the visit.

9.2 Self-Assessment Report (SAR) – Digital Format

A Self-Assessment Report (SAR) is an account of the IHL's plan, implementation, assessment and evaluation of the programme conducted. It is a report on the processes where results obtained were used in CQI at all levels of the programme's activities. This document should be concise and not exceed 100 pages with a table of contents. The emphasis shall be on qualitative discussion description of each aspect and criterion, and how these meet the requirements of the Standard expectation as set out in this Standard.

The SAR shall be structured according to Sections 9.2.1 to 9.2.9. Appendix G provides samples of formats for tabulation of information.

Supporting documents/evidences related to the SAR write-up on all the criteria should be provided. These can include (but not limited to those items in Appendix C).

9.2.1 General Information

i. Provide general information on the IHL and the specific programme together with academic calendar.

ii. Provide accreditation history (year of accreditation, conditions imposed and actions taken).

iii. Discuss changes made to the programme, stating the year the changes were introduced.

9.2.2 Programme Educational Objectives (PEO)

i. State the vision and mission of the IHL and/or faculty.

ii. List the PEO and state where they are published or publicised.

iii. Describe how the PEO are consistent with the vision and mission of the IHL and/or faculty.

iv. Describe the PEO elements/performance indicators, achievement criteria, performance targets and assessment instruments.

v. Describe the process for the periodic review (with the stakeholders involvement) and revision of the PEO.

9.2.3 Programme Outcomes (PO)

i. List down the PO and state where they are published.

ii. Describe how the PO are mapped to the PEO.

iii. Describe the processes used to establish and review the PO, addressing the outcome requirement in Section 6.2 and the extent to which the programme's various stakeholders are involved in these processes.

iv. Describe the PO assessment model adopted by providing evidences:

- Where and how each of the PO is assessed?
- What are the satisfactory attainments and measures to overcome any shortcomings?

v. Describe CQI implementation in relation to PO.

9.2.4 Academic Curriculum

i. Describe the programme structure and course contents to show how they are appropriate to, consistent with, and support the development of the range of intellectual and practical skills and attainment of the PO.

ii. Describe the programme delivery and assessment (include description of assessment rubrics for projects, case studies, etc. and non-cognitive PO) methods, methods and how these are appropriate to, consistent with, and support the development of the range of intellectual and practical skills and attainment of the PO.

iii. The information required in items i. and ii. should include but not limited to the following:

- A matrix linking courses to PO to identify and track the contribution of each course to the PO. IHL may adopt the sample overall 'Courses to PO mapping matrix included in Appendix G of this Standard to identify and track the contribution of the courses to the PO as a guiding template. IHL may adopt own mapping strategy that may be different from the sample template.

- Distribution of the engineering courses according to areas specific to each programme such as Engineering Sciences and Principles, and Applications for major disciplines (Civil, Mechanical, Electrical and Chemical as in Appendix B and other relevant areas obtained from benchmarking exercises, especially for non-conventional programmes.
- Mapping of the courses to the Knowledge Profile as in Appendix B.
- Distribution of the general education courses such as finance, management and Matapelajaran Umum (MPU) courses.
- Distribution of the courses offered according to semester.

***Note**: Format samples are available in Appendix G.*

iv. Describe how benchmarking report/s and feedback from stakeholders have been considered in Academic Curriculum improvement.

v. Describe how the requirements of Complex Problem Solving (CPS) and Complex Engineering Activities (CEA) have been addressed.

vi. Describe laboratory exercises, including delivery approach and assessment scheme; and how these are mapped to PO. Give examples of open-ended laboratory activities.

vii. Describe industrial training scheme and how it is mapped to PO.

viii. Describe exposure to professional practice and how it is mapped to PO. Give examples of professional practice activities.

ix. Describe Final Year Projects (FYP) and how it is mapped to PO.

x. Describe Integrated Design Projects (IDP), and how it is mapped to PO.

xi. Describe the criteria for Passing Courses.

xii. Describe the extent to which the programme's various stakeholders are involved in the curriculum development and review process.

xiii. Describe CQI strategies to be implemented in Academic Curriculum review.

9.2.5 Students

i. Describe the requirements and process of admission into the programme.

ii. Describe the policies and processes for credit transfer and/or exemption.

iii. Describe the counselling services available.

iv. Describe formal or informal feedback platform/channel to obtain students feedback for programme improvement, and how the feedback has been considered.

v. Describe students' workload.

vi. Describe student activities and involvement in club and society and relevant professional engineering bodies.

vii. The information required in items i. to vi. should include but not limited to the following:

- The distribution of student enrolment for all academic years for the past four (4) years (Table 6 in Appendix G).
- The entry qualifications of final year students of the current semester (Table 7 in Appendix G).

viii. Discuss student performances in relation to PO from overall holistic perspective involving both curricular and co-curricular activities, such as participation in competitions, public speaking, sports and cultural activities, etc.

ix. Describe CQI strategies to be implemented in relation to student performance.

9.2.6 Academic and Support Staff

i. Discuss adequacy, strength and competencies of the academic staff in covering all areas of the programme including implementation of outcome-based approach. The overall competence of academic staff is viewed from their diversity of background, academic qualification, academic and professional practice experiences, including their track record in teaching, research, publications, administration and service to the society, ability to communicate, enthusiasm for developing more effective programmes, level of scholarship, participation in professional societies and attainment of Professional Engineer status.

ii. Discuss how the academic staff workload enables: effective teaching, student-staff interaction, student advisory and counselling services, services (internal and external), research, professional development and industry interaction.

iii. Discuss the sufficiency and competency of technical and administrative staff in providing adequate support to the educational programme.

iv. The information required in items i. to iii. should include but not limited to the following:

- A breakdown in terms of number of academic staff (full-time, part- time and inter-programme) by year for the past four (4) years (Table 8 in Appendix G).
- An analysis of all academic staff (Table 9 in Appendix G).
- A summary of the academic qualifications of academic staff (Table 10 in Appendix G).
- A summary of the professional qualifications and membership in professional bodies/societies of academic staff (Table 11 in Appendix G). This also includes registration with Board of Engineers Malaysia for those qualified.
- A summary of the posts held by full time academic staff (Table 12 in Appendix G).
- A summary of teaching workload of academic staff for the current semester (Table 13 in Appendix G).
- An analysis of all support staff (Table 14 in Appendix G).
- A summary of the posts held by support staff (Table 15 in Appendix G).

- The staff: student ratio by year for all academic years for the past four (4) years (Table 16 in Appendix G).

- A listing of lecturers/invited speakers from industry/public bodies and their level of involvement.

v. Describe the implemented professional training scheme and incentives for academic staff. List down academic staff who have undergone or still undergoing training. Provide projected professional training programme.

vi. Describe participation of academic staff in consultancy activities.

vii. Describe participation of academic staff in research and development activities.

viii. Describe CQI strategies to be implemented in relation to academic and Support Staff.

9.2.7 Facilities

i. Discuss the adequacy of teaching and learning facilities such as classrooms, learning-support facilities, study areas, information resources (library), computing and information technology systems, laboratories and workshops, and associated equipment to cater for various delivery modes.

ii. For programmes offered partly in distance mode, or at multiple or remote locations, describe how the facilities provided are substantially equivalent to those provided for on-campus students.

iii. Describe the adequacy of access to support facilities such as hostels, sport and recreational centres, health centres, student centres, and transport in facilitating students' life on campus and enhancing character building.

iv. The information required in items i., ii. and iii. should be provided together with supporting documents.

v. A tabulated summary of the following information should be provided as follows:

- lecture facilities (give number, capacity, and audio video facilities available).
- laboratories (list down the equipment available in each laboratory).
- workshops (list down the equipment/machinery available in each workshop).
- computer laboratories (list down the hardware and software available).
- other supporting facilities such as the library (list down number of the titles of books/journals/magazines/ standards relevant to the programme).
- recreational facilities.
- information on recent improvements and planned improvements in these facilities.

vi. Describe the procedure, monitoring process, and management of safety, health and environmental aspects of facilities, including lecture halls, laboratories, teaching and safety equipment, etc.

vii. Describe maintenance and calibration of teaching equipment/apparatus.

viii. Describe CQI activities implemented in relation to facilities.

9.2.8 Quality Management Systems (QMS)

i. Outline the organisational structure of the IHL including the structure within the faculty/department/programme.

ii. Discuss the level and adequacy of institutional support, operating environment, financial resources, constructive leadership, policies and mechanisms for attracting, appointing, retaining and rewarding well-qualified staff and provision of professional development, and provision of infrastructure and support services to achieve PEO and PO and assure continuity of the programme.

iii. Discuss the mechanism for the following: programme planning; curriculum development; curriculum and content review; responding to feedback and inputs from stakeholders including industry advisors, partner industry for WBL training (if applicable), students and alumni; tracking outcomes of performance through assessment; responding to External Examiners/Advisor comments; reviewing of PEO and PO; and the CQI. Where these are discussed elsewhere in the report, specify their locations. For a new programme, the IHL also needs to discuss the processes surrounding the decision to introduce the programme.

iv. Summarise responses to the External Examiner/Advisor, IAP and stakeholders and how CQI was carried out.

v. Summarise benchmarking reports and how CQI was done.

vi. Describe how the QMS of the IHL provides quality assurance covering (not limited to) the following:

- System for Examination Regulations including Preparation and Moderation of Examination Papers: The programme has established a working system for examination regulations including preparation and moderation of examination papers.
- System of Assessment for Examinations, Projects, and Industrial Training: The programme has established a working system for assessment of examinations, projects, industrial training and other forms of learning delivery. The scope of assessment is wide enough to cover the achievement of PO.
- System for student admission and teaching and learning: The programme has established a working system for student admission and teaching and learning.
- Quality assurance can be reflected through proper and sufficient policies/ rules/regulations/procedures in the Department/Faculty or IHL, and whether those systems are implemented.

vii. Describe the management system for safety, health and environment.

viii. Describe CQI strategies to be implemented in relation to QMS.

ix. Self-assess on programme performance related to QMS.

9.2.9 Other Relevant Information

Include additional information which supports the continuing progress and visibility of the programme, such as major research accomplishments, collaboration with industry, etc.

9.3 Provision of additional information or evidence as appendices in the Self-Assessment Report (SAR)

IHL may provide the additional evidences as listed in Appendix I, as appendices in the SAR.

9.4 List of Documents to be Made Available During the Visit

During the visit, the IHL should provide sufficient documents to evaluation panel so that they can be well informed and make proper evaluation and judgement on the programme.

The institutional documents and additional documentation which are not provided in the SAR shall be made available during the visit. These may include but not limited to those in Appendix J.

9.5 Interim and Continuing Programme Accreditation

For programme that has been accorded accreditation with interim conditions, or programme applying for extension of accreditation in the same cycle, unless otherwise stated, the IHL shall submit through the Engineering Accreditation Management System (EAMS) the following documents:

i. The earlier SAR prepared for the previous accreditation visit (as noted in Section 9.2)

ii. An addendum to the SAR

The addendum shall include:

- Report related to concerns listed under accreditation conditions. Self-assess the closing of concerns, substantiated with evidences of actions taken to close the concerns, and results achieved from the actions. Summarise the closing of concerns in a tabular form.
- Updates on the fulfilment of the eight (8) Qualifying Requirements.
- Report of how the programme is addressing (closing the gap) newly introduced/revised accreditation requirements by the EAC (if any).

- Updates on any changes in information, data, statistics, status, policies, etc., and report on Continual Quality Improvement (CQI) activities related to all the accreditation criteria. These may involve for example change of programme name, PEO or PO statements, OBE model, academic curriculum (structure or content), students' entry requirements, number of academic or support staff, number of academic staff with professional qualifications, academic staff student ratio, facilities, QMS.
- Report on action taken to address issues listed under the Opportunity for Improvement (OFI) in the previous accreditation visit.
- Any other related matters to be highlighted in any section/criteria.

iii. Provision of additional information or evidence as appendices in the SAR (as noted in Section 9.3)

iv. List of Documents to be Made Available during the Visit (as noted in Section 9.4) are to be made available during the visit.

10.0 Provisional Accreditation Procedure for a New Engineering Programme

10.1 EAC Initial Evaluation

The evaluation procedure at this stage shall comprise the following steps:

i. **Application for Provisional Accreditation to Conduct a New Engineering Programme**

The IHL intending to conduct a new programme shall obtain approval from the relevant authorities.

The IHL should prepare a SAR according to Section 9 and Appendix C and submit the application for approval to the MQA and copy to the EAC.

If the SAR is considered inadequate, the IHL shall be required to provide further information. If the required information is not provided within three (3) months, it shall be deemed that the IHL has withdrawn the application.

ii. **Initial Evaluation**

EAC shall appoint an Evaluator to evaluate the proposed programme.

The evaluation shall cover the following areas:

- general awareness of current development in engineering education and engineering practice;
- the PEO and PO;
- the programme content;
- the staff*;
- the teaching facilities;
- the library/resource centre;
- the IHL's quality systems and processes;
- the assessment procedure and examination rules; and
- other related activities.

The evaluation may include a visit to the IHL by the Evaluator.

**All eligible academic staff are to be registered with BEM.*

10.2 Report and Recommendation

The report from the Evaluator shall be submitted to EAC within the timeline as pre-determined by the EAC.

10.3 EAC Decision

Based on the evaluation, EAC may decide on one (1) of the following:

i. To recommend approval of the programme to be conducted.

ii. To recommend conditional approval for the programme to be conducted with the provision that the IHL takes actions to rectify all the shortcomings indicated in the report within a specified period as determined by EAC.

iii. Not to recommend approval.

The recommendation from EAC is specific to the programme, location and mode of study. Where the same programme is offered by the IHL at different locations and/or via different modes of delivery, the IHL shall make a separate application for each of the programmes.

IHL may apply for review on the programme that is not approved.

10.4 Provisional Accreditation

Approved programme will be accorded provisional accreditation by BEM.

Bibliography

This Standard has been developed based on information and practices from the following documents:

i. Engineering Accreditation Standard 2020
https://eac.org.my/v2/wp-content/uploads/2022/09/EAC-Standard-2020.pdf

ii. Engineering Technology Programme Accreditation Standard 2020
https://drive.google.com/file/d/1p6NEJbrXoGyYikRJ1p1MCvIxeKvPcuUR/view

iii. Guidelines to Good Practices: Work Based Learning (GGP: WBL), Malaysian Qualifications Agency.
https://www2.mqa.gov.my/qad/PS/2019/GGP%20WBL%20BI%2023%20Jan%202019-merged.pdf

iv. International Engineering Alliance, Graduates Attributes & Professional Competencies Version 4, September 2021
https://www.ieagreements.org/assets/Uploads/Documents/IEA-Graduate-Attributes-and-Professional-Competencies-2021.1-Sept-2021.pdf

v. Programme Standards: Engineering and Engineering Technology Malaysian Qualifications Agency
https://www2.mqa.gov.my/QAD/garispanduan/2019/PS%20Engineering/14.%20PS%20-%20Engineering%20and%20Engineering%20Technology_BI%20-%20[FB].pdf

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- **YBhg. Dato' Ir. Dr. Goh Teik Cheong**
- **Ir. Rocky Wong Hon Thang**
- **Ir. Jayaseelan Nadarajah**
- **Ir. Prof. Dr. Kaharudin Dimyati**
- **Ir. Prof. Dr. Shaharin Anwar Sulaiman**
- **Ir. AP. Dr. Siva Kumar a/l Sivanesan**
- **Ir. Prof. Dr. Rozita Yusoff**
- **Ir. Gunasagaran a/l Kristnan**
- **Mr. Abdul Saman bin Taip**
- **Ir. Dr. Siti Hawa Hamzah (Former EAD Director)**
- **Ir. Zairul Amri Zakaria (EAD Director)**
- **Ir. Prof. Dr. Nor Kamariah Noordin (Former Associate Director)**
- **Ir. Prof. Dr. Law Chung Lim (Associate Director)**
- **Ir. Prof. Dr. Vinesh a/l Thiruchelvam (Associate Director)**
- **Ir. Prof. Dr. Rajkumar a/l Durairaj (Associate Director)**
- **Ir. Prof. Dr. Wong Hin Yong (Associate Director)**
- **Ir. Prof. Dr. Che Maznah Mat Isa (Associate Director)**
- **Ir. Prof. Madya Dr. Hasril Hasini (Associate Director)**
- **Ms. Norharniza Mohd Noor**
- **Ms. Nor Athira Mohd Jamil**
- **Mr. Mohd Nizam Abd Malik**
- **Ms. Nor Afiqah Hazwani Ramlanros**
- **Ms. Nor Hasniza Amiruddin**
- **Mr. Al Nazirudin Jainudin**
- **Mr. Zamri Zainal Abidin**

List of Appendices

Appendix A

ENGINEERING ACCREDITATION COUNCIL, EVALUATION PANEL AND ACCREDITATION APPEALS BOARD

1.0 ENGINEERING ACCREDITATION COUNCIL

1.1 The Engineering Accreditation Council (EAC), representing the BEM, the IEM, the MQA and the JPA, shall be an independent body for accreditation of engineering programmes.

1.2 The policy on accreditation of engineering programmes is laid down by the EAC and is subject to changes as deemed necessary by the EAC. Implementation of the policy is the responsibility of the EAC.

1.3 Members of the EAC shall be appointed by the BEM as follows:

a. A Chairman (nominated by the BEM)
b. A Deputy Chairman (nominated by the IEM)
c. One (1) MQA representative
d. 14 members representing each of major branches (e.g. Civil, Mechanical, Electrical, Chemical and Electronics) and each of the constituent organisations nominated by the BEM, the IEM and the JPA.

    i. Five (5) members nominated by the BEM
    ii. Five (5) members nominated by the IEM
    iii. One (1) member nominated by the JPA
    iv. Three (3) members from the major employers of engineers in Malaysia

e. Ex-Officio: Registrar of the BEM
    Secretary of the BEM

1.4 The EAC shall comprise persons from academic institutions and industries, with a minimum of 50% from industries. In appointing the members of the EAC, the BEM shall maintain a reasonable spread of expertise across various branches of engineering.

1.5 The final decision on the membership of the EAC is with the BEM.

1.6 All members shall be professional engineers, unless not available within the constituent organisation.

1.7 The terms of reference for the EAC are as follows:

i. Formulate and update the accreditation policies and criteria.
ii. Approve detailed guidelines and operating procedures for accreditation.
iii. Oversee all operational arrangements, and appoint members of the Evaluation Panel.
iv. Receive evaluation report on engineering programmes, and decide on award of accreditation.
v. Establish and maintain a list of accredited engineering programmes.
vi. Respond to any complaints or appeals on accreditation.
vii. Oversee the development and operation of accreditation and mutual recognition of programmes with other countries.
viii. Inform the Board of the activities of the EAC and where necessary make recommendations to the Board.
ix. Foster the dissemination of developments and best practices in engineering education.
x. Advice the Board on public statements or representations that should be made in relation to engineering education.
xi. Hold consultation meetings with IHL as and when necessary.
xii. Hold meetings at least six (6) times per year.

2.0 EVALUATION FOR APPROVAL TO CONDUCT A NEW PROGRAMME

2.1 The EAC shall appoint an evaluator to assess the application. The person should have extensive academic experience and/or industrial experience.

2.2 An Evaluator shall be appointed preferably from amongst the Council members from fields related to the programme being evaluated. In cases where the Council members are not available, appointment of Evaluator shall be made from amongst Associate Directors or senior Evaluation Panel members.

3.0 EVALUATION PANEL FOR ACCREDITATION

3.1 The Evaluation Panel shall be appointed by the EAC and normally consists of:

i. a Head of Panel who shall be a Professional Engineer; and

ii. two members, typically chosen for their broad experience in engineering and their ability to evaluate the generic programme outcomes and quality systems. The Evaluation Panel should include at least one member with extensive academic experience, and one member with extensive industry experience. All members must be chosen from fields related to the programme being evaluated.

All members of the Evaluation Panel shall be professional engineers unless in exceptional circumstances.

4.0 ACCREDITATION APPEALS BOARD

4.1 The Accreditation Appeals Board shall consist of the President of BEM, the President of IEM and the Chief Executive Officer of MQA or their nominated representatives. The President of BEM or his nominated representative shall be the Chairman of the Accreditation Appeals Board.

4.2 If necessary, the Accreditation Appeals Board may appoint a Special Committee, the members of which must be experienced in the accreditation process, to consider an appeal. Any expenses incurred shall be borne by the IHL making the appeal.

4.3 The decision of the Accreditation Appeals Board shall be final.

Appendix B

ENGINEERING CONTENT FOR THE MAIN BRANCHES

(a) (i) Engineering Science and Fundamentals for Main Branches

An accredited programme is expected to cover the broad areas of the respective disciplines at an appropriate level. The following are the areas to be considered for the respective programmes in the main branches:

CIVIL	MECHANICAL	ELECTRICAL	CHEMICAL
Strength of Materials	Materials	Circuits and Signals	Chemical Thermo-dynamics
Structural Analysis and Design	Statics and Dynamics	Electromagnetic Fields and Waves	Material and Energy Balance
Fluid Mechanics/ Hydraulics	Fluid Mechanics	Instrumentation and Control	Chemical Kinetics and Reactor Design
Soil Mechanics/ Geotechnical Engineering	Thermo- dynamics and Heat Transfer	Digital and Analogue Electronics	Momentum Transfer
Civil Engineering Materials	Mechanical Design	Machines and Drives	Heat Transfer
Statics and Dynamics	Instrumentation and Control	Power Electronics	Mass Transfer
Construction Engineering	Vibrations	Electrical Power Generation and High Voltage Engineering	Separation Process
Surveying	Solid Mechanics	Communications System	Process Design
Water Resources and Hydrology	Manufacturing/ Production	Power System Analysis	Process Control and Instrumentation
Highway and Transportation	Electrical Power and Machines	Electronic Drives and Applications	Safety and Environmental Protection
Environmental Studies	Electronics and Micro- processors	Electrical Energy Utilisation	Environmental Studies
	Computer Aided Engineering		Plant, Equipment Design, and Economics

(a) (ii) Engineering Applications

Emphasis on engineering applications in degree programmes aims to ensure that all engineering graduates have a sound understanding of up-to-date industrial practice, in particular:

Civil Engineering:

1. To appreciate the characteristics and structural behaviour of materials in a variety of user environments.
2. To be able to analyse and design structural components from these materials.
3. To appreciate the range of construction technology currently available and the skills which they require in people for their use.
4. To appreciate the cost aspects of material selection, construction methods, operation and maintenance in their interaction with design and the delivery of civil engineering facilities and services.
5. To understand the whole process of industrial decision-making in design, manufacturing and use and how it is influenced not only by technical ideas but also by the practical constraints of financial and human resources as well as the business and social environment of engineering.

Mechanical Engineering:

1. To appreciate the characteristic behaviour of materials in a variety of user environments.
2. To appreciate the range of manufacturing systems and industry energy currently available and the skills which they require in people for their use.
3. To appreciate the cost aspects of material selection, manufacturing methods, operation and maintenance in their interaction with design and product marketing.
4. To understand the whole process of industrial decision-making in design, manufacturing and use and how it is influenced not only by technical ideas but also by the practical constraints of financial and human resources as well as the business and social environment of engineering.

Electrical Engineering:

1. To appreciate the characteristic behaviour of materials in electrical and electronic systems.
2. To be able to analyse and design electrical and electronic systems from devices/components made of various materials.
3. To understand the concepts of generation, transmission and distribution of low and high voltage power.
4. To appreciate cost effectiveness and energy consumption of component/device equipment selection, manufacturing process and integration process.
5. To appreciate the range of manufacturing methods currently available and the skills which they require in people for their use.
6. To understand the whole process of industrial decision making in design, manufacturing and use and how it is influenced not only by technical ideas but also by the practical constraints of financial and human resources and by the business and social environment of engineering.

Chemical Engineering

1. To appreciate the physical/chemical characteristics and properties of materials.
2. To be able to adopt these materials in process design and analysis.
3. To calculate and analyse the material and energy flows for a given chemical process.
4. To understand the general sequence of processing steps for any given type of chemical process.
5. To understand the selection or estimation of process operating conditions, selection of process equipment, maintenance and process troubleshooting.
6. To analyse the various types of unit operations and processing steps and to decide their relative advantages or disadvantages on the basis of environment, economics, safety and operability.
7. To understand the various process control schemes for the purpose of maintaining production quality, ensuring process safety and preventing waste.

(b) Mathematics, Statistics and Computing

These courses should be studied to a level necessary to the engineering courses of the programme accordingly and with a bias towards application. The use of numerical methods of solution is encouraged, with an appreciation of the power and limitations of the computer for modelling engineering situations. Wherever practicable, it is preferred that mathematics, statistics and computing are taught in the context of their application to engineering problems and it follows that some mathematical techniques may be learnt within other subjects of the course. In addition to the use of computers as tools for calculation, analysis and data processing, the programme should introduce their application in such area as given in the following table:

CIVIL	MECHANICAL	ELECTRICAL	CHEMICAL
Computer Aided Analysis and Design	Computer Aided Design and Manufacture	Mathematical Applications	Computer Analysis and Design
Economics Analysis for Decision Making	Economics Analysis for Decision Making	Statistical and Numerical Techniques	Economics Analysis for Decision Making
Databases and Information Systems	Databases and Information Systems	Computer Applications	Numerical Methods and Optimisation
Operational Research	Operational Research		Operational Research
Business and Management Systems	On-line Control of Operations and Processes		Databases and Information Systems
Statistical and Numerical Techniques			

(c) Evaluating non-Traditional or Innovative Programme

IHL should promote education culture among the staff and students so that they are aware of contemporary engineering issues and the technology advancement for industry.

It is a challenge for an accreditation process to promote innovation, experimentation and dissemination of good practice, while maintaining standards that can be objectively certified nationally and internationally. Innovation by its nature challenges existing wisdom, but not every programme that departs from existing norms can be said to be innovative or desirable. All fundamentals required in the programme must be maintained.

Since this Standard is silent on the broad or areas of these non-traditional programmes/disciplines, the IHL needs to conduct extensive Academic Curriculum benchmarking exercise with established IHL conducting similar programme. A good External Examiner report will also help justify the adopted Academic Curriculum.

The EAC accreditation system encourages innovation by minimising prescriptiveness in how the required outcomes are attained. Programme evaluation will always focus on the intent of the criteria and on the demonstrated capability of graduates to enter engineering practice at a professional level. Clearly however, a programme which departs radically from the methods normally thought necessary – for example, by employing only a fraction of the normal required number of staff – may expect a more thorough examination of method as well as demonstration of the outcomes. The EAC and the Evaluation Panel are expected to be receptive to new approaches, and to use best judgement available to evaluate the substance and merit of the programme.

Continuing innovation and development can be expected to lead to restatement of the criteria and policy of accreditation.

(d) Range of Problem Identification and Solving

The range of **Complex Engineering Problem** is defined as follows:

No.	Attribute	**Complex Engineering Problems** have characteristic WP1 and some or all of WP2 to WP7:
WP1	Depth of Knowledge Required	Cannot be resolved without in-depth engineering knowledge at the level of one or more of WK3, WK4, WK5, WK6 or WK8 which allows a fundamental-based, first principles analytical approach.
WP2	Range of conflicting requirements	Involve wide-ranging and/or conflicting technical, non-technical issues (such as ethical, sustainability, legal, political, economic, societal) and consideration of future requirements
WP3	Depth of analysis required	Have no obvious solution and require abstract thinking, creativity and originality in analysis to formulate suitable models
WP4	Familiarity of issues	Involve infrequently encountered issues or novel problems
WP5	Extent of applicable codes	Address problems not encompassed by standards and codes of practice for professional engineering
WP6	Extent of stakeholder involvement and conflicting requirements	Involve collaboration across engineering disciplines, other fields, and/or diverse groups of stakeholders with widely varying needs
WP7	Interdependence	Address high level problems with many components or sub-problems that may require a systems approach

(e) Definition of Complex Engineering Activities (CEA)

The range of **Complex Engineering Activities** is defined as follows:

No.	Attribute	**Complex activities** mean (engineering) activities or projects that have some or all of the following characteristics:
EA1	Range of resources	Involve the use of diverse resources including people, data and information, natural, financial and physical resources and appropriate technologies including analytical and/or design software
EA2	Level of interactions	Require optimal resolution of interactions between wide-ranging and/or conflicting technical, non-technical, and engineering issues
EA3	Innovation	Involve creative use of engineering principles, innovative solutions for a conscious purpose, and research-based knowledge
EA4	Consequences to society and the environment	Have significant consequences in a range of contexts, characterised by difficulty of prediction and mitigation.
EA5	Familiarity	Can extend beyond previous experiences by applying principle- based approaches.

(f) Knowledge and Attitude Profile[1]

The curriculum shall encompass the **knowledge and attitude profile** as summarised in the table below:

No.	Knowledge and Attitude Profile
WK1	A systematic, theory-based understanding of the **natural sciences** applicable to the discipline and awareness of relevant **social sciences**
WK2	Conceptually-based **mathematics**, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline
WK3	A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline.
WK4	Engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.
WK5	Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports **engineering design and operations** in a practice area
WK6	Knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline.
WK7	**Knowledge of** the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development[2]
WK8	Engagement with selected knowledge in the current **research literature** of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues
WK9	**Ethics, inclusive behavior and conduct.** Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes

Notes:

1. *A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in four (4) years after STPM or equivalent of study,*
2. *Represented by the 17 UN Sustainable Development Goals (UN-SDG)*

Appendix C

ENGINEERING ACCREDITATION COUNCIL

1.0 Checklist of Documents for Accreditation* / Provisional Accreditation[1] and Relevant Information

Please tick:

Accreditation	
Provisional Accreditation	

Name of IHL:

Programme for Accreditation / Provisional Accreditation:

*** For accreditation of programme only, please fill out the table below for qualifying requirements:**

A. QUALIFYING REQUIREMENTS

No.	Description of the Qualifying Requirements	YES	NO
1	A minimum 135 SLT credits of which 90 credits must be engineering courses offered over a period of four (4) years. (Based on SLT)		
2	Integrated Design Project (IDP)		
3	Final Year Project (FYP) minimum six (6) credits)		
4	Industrial Training (minimum of eight (8) weeks)		
5	Full-time Academic Staff (minimum of eight (8) with at least three (3) Professional Engineers registered with the BEM or its equivalent		
6	Academic Staff: student ratio of 1: 20 or better		
7	External Examiner/Advisor report. (One in every two (2) years.)		
8	Programme Educational Objectives (PEO) and Programme Outcomes (PO)		

Failure to meet any one (1) of the qualifying requirements will mean that the programme shall not be assessed for accreditation, and the process shall stop here and no submission to the EAC can be made by the IHL. IHLs are advised to ensure all requirements are fulfilled by the programme before re-applying for accreditation.

1. *For Provisional Accreditation, please fill response to this Appendix wherever applicable.*
   For new programme, a commitment to the minimum eight (8) full-time academic staff, academic staff: student ratio of 1:20 or better is expected, and appointment of External Examiner/Advisor.

2.0 INTRODUCTION

***** *Delete where applicable*

This Appendix contains checklist of Documents for Accreditation/Provisional of New Programme and Relevant Information as follows:

1. Section A to I: Self-Assessment Report (SAR) to be submitted.
2. Section J: Supporting documents to be submitted in digital format with the SAR.

A. GENERAL INFORMATION

No.	Item	To be filled by the IHL where applicable	Checked by EAD
1	Name of IHL		
2	Address of IHL		
3	Name of Faculty/School/Department		
4	Name and phone number of Staff to be contacted		
5	Programme for Accreditation		
6	EAC Reference Number		
7	Degree to be Awarded and Abbreviation.		
8	IHL Awarding the Degree: (if different from A1).		
9	Mode of Study [Full-Time/Twinning/Part-Time/Others (please specify)].		
10	Duration of Programme (in years).		
11	Medium of Instruction of Programme Evaluated		
12	Language Available for Reference Materials		
13	IHL Academic Session		
14	URL Address; IHL website		

B. PROGRAMME ACCREDITATION HISTORY

No.	Aspect	To be filled by the IHL where applicable	Checked by EAD
1	Introduction Year of Programme		
2	Year of last accreditation for this programme		
3	Conditions (if any) from previous accreditation		
4	Action taken on the conditions above		
5	Major changes (self-initiated), reasons and year of changes		

C. CRITERION 1: PROGRAMME OBJECTIVES (PEO)

Refer to Sections 8.1 and 9.2.2

D. CRITERION 2: PROGRAMME OUTCOMES (PO)

Refer to Sections 8.2 and 9.2.3

E. CRITERION 3: ACADEMIC CURRICULUM

Refer to Sections 8.3 and 9.2.4

F. CRITERION 4: STUDENTS

Refer to Sections 8.4 and 9.2.5

G. CRITERION 5: ACADEMIC AND SUPPORT STAFF

Refer to Sections 8.5 and 9.2.6

H. CRITERION 6: FACILITIES

Refer to Sections 8.6 and 9.2.7

I. CRITERION 7: QUALITY MANAGEMENT SYSTEMS (QMS)

Refer to Sections 8.7 and 9.2.8

J. SUPPORTING DOCUMENTS

To be submitted as evidences with SAR.

Ref. item	Supporting documents required	Indicate the location of these items in the digital form	Checked by evaluation panel
A1 – A14	Official publications relating to the faculty/School/ Department/Programme, undergraduate prospectus and other information accessible through website.		
B1 – B5	Programme's previous accreditation history, reports, relevant letters, and other relevant documents.		
C1	Documented evidences of publication or dissemination of vision and mission statements.		
C2	Documented evidences of publication or dissemination of PEO statements.		
C4	Documented evidences of publication of PEO elements/performance indicators, achievement criteria, and performance targets.		
C5	Sample responded questionnaires/survey forms and/or other tools used to establish/formulate/define PEO elements/performance indicators, and review the PEO.		
	Documented evidences such as minutes of meetings, training lists and documents, workshop reports, briefing notes, reminders, relevant forms, and internal communications, instructions, etc. of the processes related to PEO, and the involvement of various internal and external stakeholders in these processes to support claims made in this section.		
D1	Documented evidences of publication or dissemination of PO statements.		
	Documented evidences of publication or dissemination of definition of PO elements/performance indicators.		
D3	Sample responded questionnaires/survey forms and/or other tools used to establish/formulate/define PO elements/performance indicators, and review of the PO.		
D4	Documented evidences of publication or dissemination of the OBE model adopted to deliver, assess and evaluate achievement of the PO.		
D5	Documented evidences of how the processes and results obtained from the processes resulted in the CQI of PO.		

E3	Documented evidences of publication or dissemination of overall 'Courses to POs' mapping matrix.		
E5	Documented evidences of publication or dissemination of the elaboration/definition of CPS, CEA and Knowledge Profile.		
E6	List of titles of experiments in the laboratory and documented evidences showing open- ended laboratory activities.		
E7	List of industrial training companies.		
E8	List of exposure to professional practice activities and sample students' reports.		
E9	List of final-year project titles and learning outcomes and Course to Programme Outcomes matrix.		
E10	Design (capstone) project's synopsis and learning outcomes and Course to Programme Outcomes matrix.		
E11	Documented evidences showing programme implementation of the 'Condition for Passing Courses'.		
E12	Provide documented evidences such as minutes of meetings, training lists and documents, workshop reports, briefing notes, reminders, relevant forms, and internal communications, instructions, etc. of the processes related to Academic Curriculum, and the involvement of various internal and external stakeholders in these processes to support claims made in this section.		
E13	Documented evidences of how the processes and results obtained from the processes resulted in the CQI to be implemented in Academic Curriculum.		
F1	Documented evidences showing the students admission requirements to the programme.		
F2	Documented evidences showing the policies and processes for credit transfer/exemption.		
F3	Documented evidences showing available students' counselling services.		
F4	Documented evidences showing formal or informal feedback platform/channel to obtain students feedback and suggestions for further programme improvement.		
F6	Documented evidences showing students' involvement in student organisations and relevant professional engineering bodies that provide experience in management and governance, representation in		

	education and related matters, non-academic or co-curricular activities, and social activities.		
F8	Provide documented evidences showing students' performance in relation to PO from an overall holistic perspective, from both curricular and co-curricular activities, such as participating in design competition, public speaking activities, etc.		
F9	Documented evidences of CQI strategies to be implemented in relation to student performance.		
G1	Documented evidences of staff training to ensure real understanding and implementation of OBE, as well as other training such as effective communication skills, teamwork, leadership, etc.		
G5	Documented evidences showing participation of academic staff in professional training and qualifications, and programme's projection/plan on professional training schemes for academic staff.		
G6	Documented evidences showing participation of academic staff in consultancy activities.		
G7	Documented evidences showing participation of academic staff in research and development activities.		
G8	Documented evidences of CQI strategies to be implemented in relation to academic and support staff		
H5	Documented evidences of procedures and monitoring of health and safety aspects of facilities including lecture halls, laboratories, equipment, etc.		
H6	Documented evidences of maintenance and calibration of facilities and equipment/apparatus in the laboratories or elsewhere.		
H7	Documented evidences of CQI activities to be implemented in relation to facilities.		
I1 – I9	Documented evidences of (not limited to): ○ QMS and organisational structure. ○ Available policies. ○ Standard Operating Procedures (SOP), or ISO or other certifications. ○ Relevant files (including course files) and documentations. ○ Relevant minutes of meeting (MoM) related to QMS, such as from IAP's meetings, Quality Committee meeting, etc. ○ Management system for safety, health and		

	environment. ○ Letters of appointment of IAP, External Examiner/Advisor, and committee members, etc. ○ External Examiner/Advisor reports. ○ Benchmarking report/s. ○ Provide responses to close the loop of feedback from stakeholders. ○ Evidences of CQI strategies to be implemented in relation to QMS		

Appendix D

ENGINEERING ACCREDITATION COUNCIL

Evaluation Panel Report

Name of IHL:

Programme for Accreditation:

Date of the Visit:

General Remarks

A. QUALIFYING REQUIREMENTS

No.	Description of the Qualifying Requirements	YES	NO
1	A minimum 135 SLT credits of which 90 credits must be engineering courses offered over a period of four (4) years (Based on SLT)		
2	Integrated Design Project (IDP)		
3	Final Year Project (FYP) (minimum six (6) credits)		
4	Industrial training (minimum of eight (8) weeks)		
5	Full-time Academic Staff (minimum of eight (8)) with at least three (3) Professional Engineers registered with the BEM.		
6	Academic Staff: Student ratio of 1: 20 or better		
7	External examiner/advisor report. (One (1) in every two (2) years.)		
8	Programme Educational Objectives (PEO) and Programme Outcomes (PO)		

B. ASSESSMENT

***** Delete where applicable

ASSESSMENT CRITERIA

1. CRITERION 1: PROGRAMME EDUCATIONAL OBJECTIVES

Comments/Remarks on Programme Educational Objectives: The Evaluation Panel shall comment on the appropriateness of the Programme Educational Objectives as required by Section 4.0 and 8.1 of the Standard.

1.1 General Observations:

Performance Indicators	
Statements are well-defined, measurable and achievable	**YES** ☐ **NO** ☐ Remarks:
Statements are well published and publicised	**YES** ☐ **NO** ☐ Remarks:
Clear linkage between Programme Educational Objectives and Programme Outcomes	**YES** ☐ **NO** ☐ Remarks:
A documented and effective process, involving programme stakeholders, for the periodic review and revision	**YES** ☐ **NO** ☐ Remarks:
Assessment of performance available and subsequent CQI indicated.	**YES** ☐ **NO** ☐ Remarks:

Overall Comments / Remarks

2. CRITERION 2: PROGRAMME OUTCOMES

Comments/Remarks on Programme Outcomes: The Evaluation Panel shall comment on the appropriateness of the Programme Outcomes as well as the Processes and Results as required by Section 5.0 and 8.2 of the Standard.

2.1 Observation on Programme Outcomes:

2.2 Observation on Processes and Attainment:

2.3 Observation on Stakeholders Involvement:

Overall Findings / Remarks

Strength	
Weakness	
Concern	
Opportunity for Improvement	

3. CRITERION 3: ACADEMIC CURRICULUM

3.1 Credits

a. Total number of credit hours

b. Number of credit hours for engineering subjects

c. Number of credit hours for related non-engineering subjects

3.2 The Curriculum

a. Programme Structure, Course Contents, and Balanced Curriculum

Observation

b. Programme Delivery and Assessment Methods

Observation
Delivery: Assessment:

c. Laboratory

Observation

d. Integrated Design Project

Observation

e. Final-Year Project

Observation

f. Industrial Training

Observation

g. Exposure to Professional Engineering Practice

Observation

Overall Findings / Remarks

Strength	
Weakness	
Concern	
Opportunity for Improvement	

4. CRITERION 4: STUDENTS

4.1 Students Admission

a. Entry requirements (Academic)

Students entering (entry requirements) the programme have GOOD PRINCIPAL PASSES in mathematics and natural sciences or their equivalent.	**YES** ☐ **NO** ☐ Remarks:
Programme ensured that students, who do not meet the above criteria, undertake suitable remedial programmes in order to attain the equivalent entry qualification.	**YES** ☐ **NO** ☐ Remarks:

b. Transfer Policy/Selection Procedures/Appropriateness of arrangement of Exemptions from part of the course

Programme has clear policies on credit transfer/credit exemptions.	**YES** ☐ **NO** ☐ Remarks:
Programme has put in place the mechanism for credit transfer/credit exemption to allow alternative educational pathways. • A maximum of 30% of the total credit hours is allowed for vertical credit transfer/credit exemption (Diploma to Bachelor Degree). • A maximum of 50% of the total credit hours is allowed for lateral credit transfer/credit exemption (Bachelor to Bachelor Degree)	**YES** ☐ **NO** ☐ Remarks:

4.2 Students Development

	YEAR 1	YEAR 2	YEAR 3	YEAR 4
Number of students interviewed				

a. Student Counselling

The IHL has counselling unit/section /department with qualified counsellor(s).	**YES** ☐ **NO** ☐ Remarks:
Programme monitors and evaluates student performance, advice and counsel students regarding academic and career matters, as well as provide assistance in handling health, financial, stress, emotional and spiritual problems.	**YES** ☐ **NO** ☐ Remarks:
Programme has academic mentor-mentee system.	**YES** ☐ **NO** ☐ Remarks:

b. Workload

Students workload is not burdensome.	**YES** ☐ **NO** ☐ Remarks:

c. Enthusiasm and motivation

The teaching-learning environment is conducive.	**YES** ☐ **NO** ☐ Remarks:

Students have avenues to provide feedback and suggestions about the programme.	**YES** ☐ **NO** ☐ Remarks:

d. Co-curricular activities

Programme ACTIVELY encourages student participation in activities that provide experience in management and governance.	**YES** ☐ **NO** ☐ Remarks:

e. Observed attainment of Programme Outcomes by students

Overall Findings / Remarks

Strength	
Weakness	
Concern	
Opportunity for Improvement	

5. CRITERION 5: ACADEMIC AND SUPPORT STAFF

5.1 Academic Staff

	< 1 YEAR	1-5 YEARS	6-10 YEARS	> 10 YEARS
Number of academic staff interviewed				

a. Number and Competency of academic staff

Total number of academic staff teaching the programme	
All eligible academic staff are registered with BEM	**YES** ☐ **NO** ☐ Remarks:
Academic staff are sufficient in number and competencies to cover all curricular areas.	**YES** ☐ **NO** ☐ Remarks:
Academic staff have the education, diversity of background, engineering experience, teaching experience.	**YES** ☐ **NO** ☐ Remarks:
Academic staff have the ability to communicate, enthusiasm for developing more effective programmes, level of scholarship.	**YES** ☐ **NO** ☐ Remarks:
Academic staff participate in professional societies and attainment of Professional Engineer status or as Corporate Members of Learned Bodies	**YES** ☐ **NO** ☐ Remarks:

b. Qualification, industrial experience & development

Total number of teaching staff teaching the programme with professional/industrial/specialist certificates or at least two (2) years of relevant industrial work experience	
Total number of academic staff teaching the programme with P.Eng. qualification.	
Total number of academic staff with PhD qualification.	
Total number of academic staff with Masters qualification.	

c. Research/publication/consultancy

Academic staff are given opportunities to conduct research and do consultancy.	**YES**		**NO**	
	Remarks:			

d. Industrial involvement

Academic staff are given provision to undergo industrial attachment towards attaining P.Eng. qualification.	**YES**		**NO**	
	Remarks:			
Academic staff are involved in appropriate professional/learned bodies providing services towards the development of the entity.	**YES**		**NO**	
	Remarks:			

e. Teaching load/contact hours

Average teaching hours per week is less than 15	**YES**		**NO**	
	Remarks:			

f. Motivation and enthusiasm

Academic staff know that IHL has adequate policies and mechanisms for retaining and rewarding well-qualified staff.	**YES** ☐	**NO** ☐ Remarks:
Academic staff are satisfied and motivated with their work environment.	**YES** ☐	**NO** ☐ Remarks:

g. Use of lecturers from the Industry

Academic staff organise industry talk towards enhancing students' learning activities.	**YES** ☐	**NO** ☐ Remarks:

h. Implementation of the Outcome-Based approach to education

Academic staff understand and implement OBE in the teaching and learning of the programme	**YES** ☐	**NO** ☐ Remarks:

5.2 Support Staff (Laboratory and Administration)

	< 1 YEAR	1-5 YEARS	6-10 YEARS	> 10 YEARS
Number of support staff interviewed				

a. Qualification and experience

Laboratory staff are qualified.	**YES** ☐ **NO** ☐ Remarks:
Total number of laboratory staff.	
Total number of administrative staff.	

b. Adequacy of support staff

Laboratory staff adequacy is satisfactory (ideally 1 staff to 2 laboratories)	**YES** ☐ **NO** ☐ Remarks:
Administrative staff adequacy is satisfactory to support programme's operation.	**YES** ☐ **NO** ☐ Remarks:

5.3 Development of Staff

a. Staff development

Academic staff development: The IHL has systematically plan and provide appropriate sponsorship for postgraduate studies/ sabbatical leave, professional training towards P.Eng qualification. Academic staff development: The IHL has systematically plan and provide appropriate training and conferences. Academic staff development: The IHL provides appropriate assistance in paying annual professional membership fees.	**YES**	**NO** Remarks:
Laboratory/Technical support staff: The programme has provided the opportunities for them to upgrade their competencies through training and practical exposure. Laboratory/Technical support staff: The programme has provided safety training.	**YES**	**NO** Remarks:

b. Staff assessment

Annual assessment of staff performance is well understood. Assessment takes into account participation in professional, academic and other relevant bodies as well as community involvement.	**YES**	**NO** Remarks:
The programme established a working system for evaluation/feedback by students on matters relevant to the academic environment.	**YES**	**NO** Remarks:

c. Academic staff: student ratio

Ratio is 1:20 or better for the period of assessment.	**YES**	**NO** Remarks:

Overall Findings / Remarks

Strength	
Weakness	
Concern	
Opportunity for Improvement	

6. CRITERION 6: FACILITIES

a. Lecture rooms - quantity provided and quality of A/V

Lecture rooms and theatres provided are in satisfactory condition equipped with learning facilities and equipment.	**YES** ☐ **NO** ☐ Remarks:
Maintenance of facilities and equipment are in proper order and properly documented.	**YES** ☐ **NO** ☐ Remarks:
Safety and health of the lecture room is satisfactory.	**YES** ☐ **NO** ☐ Remarks:

b. Laboratory/workshop - student laboratory and equipment

Number of laboratories/workshops available.	
Laboratories/Workshops provided are in satisfactory condition equipped with adequate equipment to facilitate learning of modern engineering practice. Equipment and testing bays to accommodate FYP, IDP, mini projects and other activities are adequate and satisfactory.	**YES** ☐ **NO** ☐ Remarks:
Maintenance of facilities and equipment are in proper order and properly documented. Safety and health practice of the laboratory/ workshop is satisfactory.	**YES** ☐ **NO** ☐ Remarks:

c. IT/computer laboratory - adequacy of software and computers

IT/computer laboratories provided are in satisfactory condition equipped with up-to-date computing and software facilities including internet access and online platforms. Engineering original software to accommodate analysis & design, FYP and IDP's activities and simulation are adequate and satisfactory.	**YES**	**NO** Remarks:
Maintenance of facilities and equipment are in proper order and properly documented. Safety and health practice of the IT/computer laboratory is satisfactory.	**YES**	**NO** Remarks:

d. Library/resource centre - quality and quantity of books, journals, and multimedia

Number of books and related materials for the programme are satisfactory. Number of electronic/digital books and references for the programme are satisfactory.	**YES**	**NO** Remarks:
Learning facilities and spaces are satisfactory. Discussion rooms are available and satisfactory. Opening hours are conducive to students.	**YES**	**NO** Remarks:
Maintenance of facilities and equipment are in proper order and properly documented. Safety and health practice of the library is satisfactory.	**YES**	**NO** Remarks:

e. Recreation facilities

The IHL provides a lively and dynamic atmosphere for the students: • The IHL provides student accommodations. • The IHL provides sport and recreational centres. • The IHL provides health centre. • The IHL provides student centre (including surau/masjid). • The IHL provides eateries/cafe.	**YES** ☐ **NO** ☐ Remarks:
Maintenance of facilities and equipment are in proper order and properly documented. Safety and health practice of the facilities are satisfactory.	**YES** ☐ **NO** ☐ Remarks:

Overall Findings / Remarks

Strength	
Weakness	
Concern	
Opportunity for Improvement	

7. CRITERION 7: QUALITY MANAGEMENT SYSTEMS

7.1 Institutional Support, Operating Environment, and Financial Resource.

a. Sufficient to assure quality and continuity of the programme

The institutional support and financial resources are sufficient to ensure programme quality and continuity. Support from external bodies is observed.	**YES**		**NO**	
	Remarks:			

b. Sufficient to attract and retain well-qualified academic and support staff

The institutional support and financial resources are sufficient for the programme to attract and retain well-qualified academic (take note of employing international academic staff, to comply with the BEM regulation to register) and support staff.	**YES**		**NO**	
	Remarks:			

c. Sufficient to acquire, maintain, and operate facilities and equipment

The institutional support and financial resources are sufficient for the programme to acquire, maintain and operate facilities and equipment.	**YES**		**NO**	
	Remarks:			

7.2 Programme Quality Management and Planning

a. System for programme planning, curriculum development, and regular review of curriculum and content

There are established systems towards the improvement of overall programme quality. There are proper and sufficient policies/rules/regulations/procedures in the Department/Faculty or the IHL and properly implemented including benchmarking and CQI.	**YES**		**NO**	
	Remarks:			

7.3 External Assessment's Report and Advisory System

a. External Examiner/Advisor report and how these are being used for quality improvement

External Examiner/Advisor report one (1) in every two (2) academic years.	**YES**		**NO**	
	Remarks:			

b. Advisory panel from industries and other relevant stakeholders

Industry Advisory Panel is available. Minutes of meeting one (1) in every year.	**YES**		**NO**	
	Remarks:			

7.4 Quality Assurance

a. System for student admission and teaching and learning

The programme has established a working system for student admission and teaching and learning to assure the achievement of the programme outcomes.	**YES**		**NO**	
	Remarks:			

b. System of assessment and evaluation of examinations, projects, industrial training, etc. including preparation and moderation of examination papers

The programme has established a working system for examination regulations including preparation, moderation and assessment of examination papers, projects, industrial training and other forms of learning delivery.	**YES**		**NO**	
	Remarks:			

7.5 Safety, Health and Environment

a. System for managing and implementation of safety, health and environment

There is in place a system for managing and implementation of safety, health and environment.	**YES**		**NO**	
	Remarks:			

Overall Findings / Remarks

Strength	
Weakness	
Concern	
Opportunity for Improvement	

EVALUATION PANEL ASSESSMENT REPORT SUMMARY

Overall Comments/Remarks:

Name of IHL:

Programme Title:	
Faculty:	
Date of Visit:	

Strength	
Weakness	
Concern	**MAJOR CONCERN** **MINOR CONCERN**
Opportunity for Improvement	
Other remarks	
Suggested Branch	

Please Mark (x)	Evaluation Panel's recommendation	Graduating Years
	Full Accreditation (6 years)	E.g. 2021, 2022, 2023, 2024, 2025 and 2026.
	Accreditation (6 years) with interim report/interim visit within 1/2/3 years	E.g. 2021, 2022, 2023, 2024, 2025 and 2026.
	Condition(s) to meet/Recommendation for further improvement	
	Accreditation (3 years)	E.g. 2021, 2022 and 2023
	Condition(s) to meet/Recommendation for further improvement	
	Decline/Defer Accreditation	
	Comments	

Prepared and submitted by Evaluation Panel:		**Signature**
Head:		
Member:		
Member:		
Date:		

ACTION BY ENGINEERING ACCREDITATION COUNCIL (EAC)

Date Received by the EAC:

Comments by the EAC:

Recommendation by EAC

Concurs with Evaluation Panel	**YES**		**NO**	

If not agreeable with Evaluation Panel's recommendation, EAC recommendations are:

Please Mark (x)	**Evaluation Panel's recommendation**	**Graduating Years**
	Full Accreditation (6 years)	E.g. 2021, 2022, 2023, 2024, 2025 and 2026.
	Accreditation (6 years) with interim report/interim visit within 1/2/3 years	E.g. 2021, 2022, 2023, 2024, 2025 and 2026.
	Condition(s) to meet/Recommendation for further improvement	
	Accreditation (3 years)	E.g. 2021, 2022 and 2023
	Condition(s) to meet/Recommendation for further improvement	
	Decline/Defer Accreditation	
	Reasons	
	Condition(s) to meet	

ACTION BY SECRETARIAT	
Date of Transmission of decision to BEM	
Date of Transmission of decision to MQA	
Date of Transmission of decision to JPA	
Date of Issue of Accreditation Certificate	

Appendix E

EXTERNAL EXAMINER/ADVISOR REPORT

Among others, the External Examiner/Advisor may comment and give suggestions for further improvement on the following in the report:

(i) Programme curriculum.

(ii) OBE implementation and achievement of the PO.

(iii) The quality of staff assigned to the programme.

(iv) Student workload and involvement in extra-curricular activities.

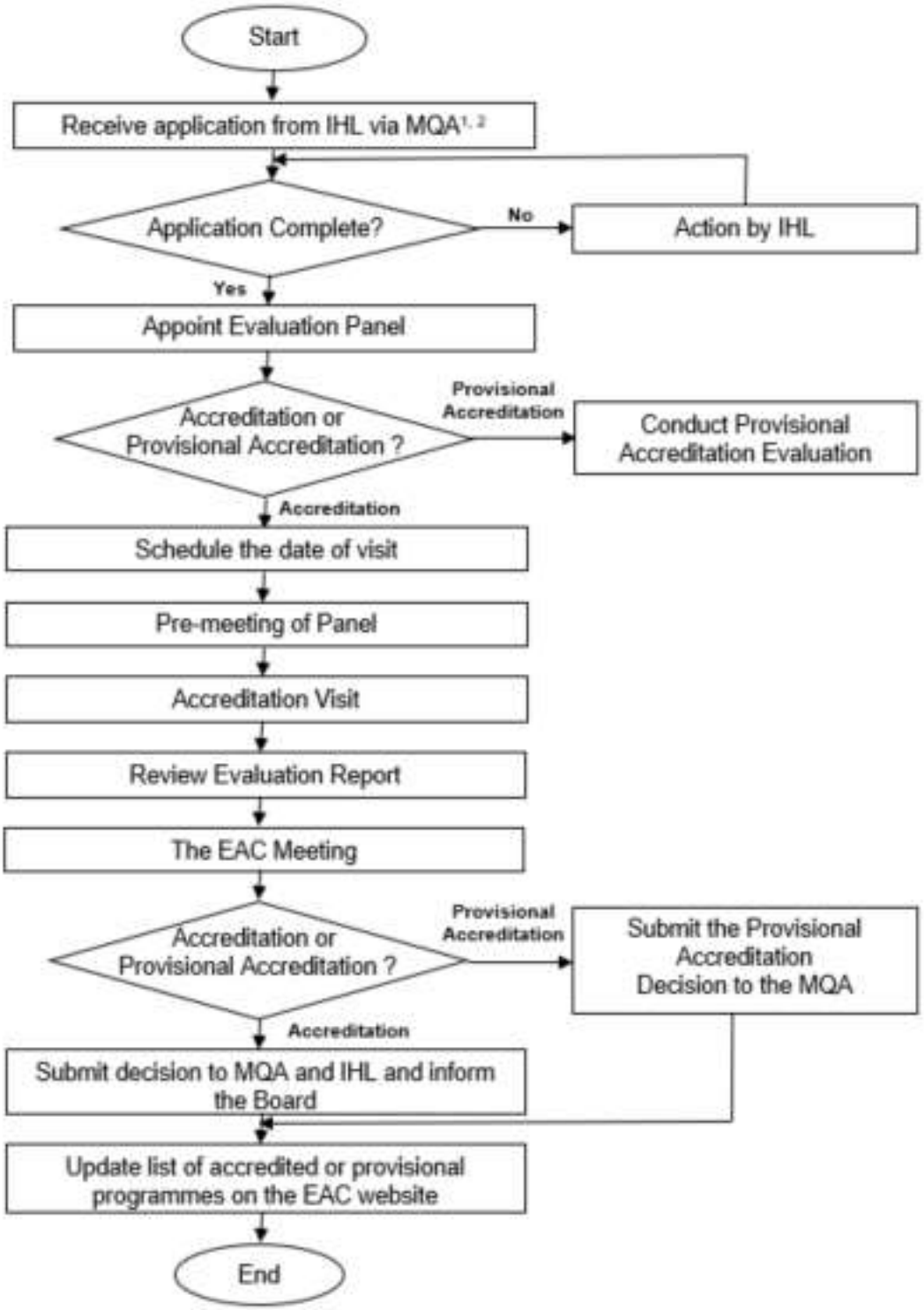
(v) Quality of examination papers as well as other coursework components.

(vi) Quality management system of the programme.

(vii) Facilities that support the programme.

Appendix F

PROCESS FLOW CHART FOR APPLICATION OF ACCREDITATION AND PROVISIONAL ACCREDITATION OF ENGINEERING PROGRAMMES



Notes:

1. *Submit to MQA; MQA-01 for New Programme / MQA-02 for New Cycle together with the accreditation fees.*

2. *Submit the Self-Assessment Report through Engineering Accreditation Management System (EAMS).*

3. *Application for Recommendation for Provisional Accreditation to conduct an engineering programme is to be submitted before offering the engineering programme.*

4. *Provisional Accreditation to conduct any engineering programme does not guarantee full accreditation. The faculty needs to apply for accreditation of the programme as specified in the EAC Standard.*

Appendix G

SAMPLE TABLE TEMPLATES FOR SELF-ASSESSMENT REPORT (SAR)

TABLE 1: Course to PO Matrix (SAMPLE)

Code:	Course:	Core/ Elective:	Link to the PO										
			1	2	3	4	5	6	7	8	9	10	11
ENGXXA	Course 1	Core	X			X						X	
ENGXXB	Course 2	Core		X	X	X							
ENGXXC	Course 3	Elective	X			X		X					
ENGXXD	Course 4	Elective	X		X							X	
ENGXXE													
ENGXXF													
ENGXXG													
ENGXXH													
ENGXXJ													
ENGXXK													
ENGXXL													

NOTE: *Programmes can adopt other approaches and not necessarily adhere to the above table.*

TABLE 2: Distribution of Engineering Courses for an Engineering Programme (SAMPLE)

Groupings	Course Code	Course	Course Type	Student Learning Time							Credits
				Guided Learning					Self-learning	Others E.g. Assessment	
				Lecture	Lab/ Workshop	Project	PBL/ Design	Tutorial			
Broad Area 1	ENG11A	Subject1	Common	28	28						3
	ENG11B	Subject2	Common	28		28					3
	ENG21A	Subject3	Common	28				28			3
Board Area 2	ENG21B	Subject4	Core	42							3
	ENG23A	Subject5	Core	14	28		28				3
	ENG241A	Subject6	Core								
Elective Courses	MPW211Y	Elective I	Elective								
	MPW213Z	Elective II	Elective								
	MPW214X	Elective III	Elective								
Industrial Training	IT234	Industrial Training	Core			16 weeks					8
TOTAL CREDITS											
Final Project	FP1	Project 1	Core			Thesis					
	FP2	Project 2	Core			Thesis					
TOTAL CREDIT HOURS FOR ENGINEERING COURSES											

TABLE 3: List of Elective Courses according to Areas of Field of Specialisation (if applicable) (SAMPLE)

AREAS	CODE	ELECTIVE COURSES
Broad Area 1		
Broad Area 2		
Broad Area 3		
Broad Area 4		
Broad Area 5		

TABLE 4: Distribution of General Education Courses for an Engineering Programme (SAMPLE)

Areas (EAC)	Code	Course	Course Type	Student Learning Time						Credits
				Guided Learning				Self-learning	Others Eg: assessment	
				Lecture	Lab/Work-shop/ Project	Tutorial	Others			
	XXXX	Subject 1	Core	42		14	xxx			xxx
Applied Science/ Maths/Computer	XXXY	Subject 2	Core	28	28					xxx
	XXXZ	Subject 3	Core	42		6				xxx
	TOTAL CREDITS									XXX
Management/Law/ Accountancy	XXXX	Subject 1	Core	42						
	XXXY	Subject 2	Core	42						
	TOTAL CREDITS									XXX
	XXXV	Subject 1	Core	35		14				
Communication Skills/Humanities/ Ethics	XXXW	Subject 2	Core	42						
	XXXX	Subject 3 Subject 4	Core |	28 28						
	XXXY	Subject 5	Core	42						
	XXXZ		Core							
	TOTAL CREDITS									XXX
Co-Curriculum	H	Co-Curriculum 1	Core	14						
	H	Co-Curriculum 2	Core	14						
	TOTAL CREDITS									XXX
TOTAL CREDITS FOR GENERAL EDUCATION COURSES										XXX

TABLE 5: Courses Offered (Programme Structure) According to Semester and Total Credit (SAMPLE)

Semester	Course Code	Course	Course Type	Credit
1	GED11A	Course A	Common	3
	GED11B	Course B	Common	3
	MPU111H	Course H	Compulsory	3
	BEE101	Course 1	Core	3
	BEE102	Course 2	Core	4
	BEE103	Course 3	Core	3
2	GED21C	Course C	Core	3
	BEE201	Course 4	Core	3
	BET201	Course 6	Core	3
	BET202	Course 7	Core	3
	BET203	Course 8	Core	3
	BEE202	Course 9	Core	4
3	MPU314K	Course K	Compulsory	3
	BEE302	Course 10	Core	3
	BET303	Course 11	Core	3
	BEE304	Course 12	Core	4
	BET305	Course 13	Core	2
	GED311M	Course M	Core	2
4	BEE401	Course 14	Core	3
	BEE402	Course 15	Core	3
	GED441G	Course G	Elective	3
	BEE403	Course 16	Core	3
	BET404	Course 17	Core	4
5	DEE501	Course 18	Core	3
	MPU511L	Course L	Compulsory	3
	DEE502	Course 19	Core	3
	DEE503	Course 20	Core	3
	GEE512	Course H	Elective	4
6	DUT601	Course 21	Core	3
	GED602	Course 22	Core	3
	BEE603	Course 23	Core	3
	BEE604	Course 24	Elective	4
	BEE605	Course 25	Core	3
	BEE606	Final Year Project 1	Core	6
7	BET701	Course 26	Core	6
	BET702	Course 27	Core	3
	BET703	Course 28	Core	3
	GET714	Course 29	Elective	3
	BEE712	Final Year Project 2	Core	4
8	BUT801	Industrial Training	24 weeks	12
TOTAL CREDIT HOURS				**140**

TABLE 6: Distribution of Students Enrolment for all Academic Years for the Past Four (4) Years

Year	Year			
	202a	202b	202c	202d
1st Year				
2nd Year				
3rd Year				
4th Year				
Total No. of Students Per Year				

TABLE 7: Entry Qualification of Final Year Students of the Current Year

Entry	Number
STPM	
Matriculation	
Foundation	
A-Level	
Diploma	
Others (Please Specify)	
TOTAL	

TABLE 8: Breakdown in Terms of Numbers of Academic Staff (Fulltime, Part-Time and Interprogramme) by Year for all Academic Years for the Past Four (4) Years

ACADEMIC STAFF	SESSION			
	202a	202b	202c	202d
(a) Total number of full-time academic staff (including those servicing other programmes, staff on study or sabbatical leave)				
(b) Full-time equivalent of academic staff servicing other programmes				
(c) Academic staff (on study or sabbatical leave)				
(d) Effective full-time academic staff = (a)-(b)-(c)				
(e) Full-time equivalent of academic staff from other programmes servicing this programme				
(f) Full-time equivalent of part time academic staff				
Full-Time Equivalent Academic Staff Contributing to Academic Staff: Student Ratio = (d)+(e)+(f)				

Notes

i. If an academic staff member is involved in teaching more than one degree programme (including off-campus and distance learning), then the full-time equivalent of that particular academic staff has to be calculated.

ii. For full-time equivalent academic staff calculation, the following can be used as a basis:

- *One Full-Time Equivalent Academic Staff Member should normally have 15 contact hours (lecture/tutorial/lab supervision/student consultation) per week.*

TABLE 9: Analysis of all Academic staff

Name	Post Held	Date of First Appointment at the Faculty/School/Dept.	Part or Full Time or from other Programmes	Academic Qualifications/ Field of Specialization/ Institution and Year of Award	Professional Qualifications	Membership in Professional Bodies	Years of Experience		Level of Activity (high, med, low, none)					
							Govt./ Industry Practice	This Faculty/School/Dept	Professional Society (Indicate Society)	Research	Consulting/ Work in Industry	Publications	Administration

TABLE 10: Academic Qualifications of Academic Staff

Academic Qualifications	Number
Doctorate	
Masters	
Bachelor	
TOTAL	

TABLE 11: Professional Qualifications and Membership in Professional Bodies/Learned Societies of Academic Staff

Type of Qualification/Field	Total Number of Staff	Registration/ Certification number
Graduate Engineer BEM		
PEng		
CEng		
CPEng		
FIEM		
MIEM		
Graduate Member IEM		
IEAust		
Others (please specify such as APEC, Int PE)		

TABLE 12: Post Held by Academic Staff

Post	Number	
	Full Time	Part Time
Professor		
Assoc. Professor		
Assistant Professor		
Senior Lecturer		
Lecturer		
Others (please specify)		
TOTAL		

TABLE 13: Academic Staff Teaching Workload Summary for the Current Semester

Staff Member (Name)	Part or Full Time or From Other Programme	Courses Taught (Course Code/Credits)

TABLE 14: Analysis of All Support Staff

Name	Post Held	Date of First Appointment at the Fac/Sch/Dept	Academic Qualifications/Field of Specialisation/ Institution and Year of Award	Years of Experience	
				Govt/Industry Practice	This Fac/Sch/Dept

TABLE 15: Post Held by Support Staff

Post	Number
TOTAL	

Table 16: Academic Staff: Student Ratio

SESSION	202a/202b	202b/202c	202c/202d	202d/202e	AVERAGE
RATIO					

Appendix H

GUIDELINES FOR EVALUATION PANEL

1. INTRODUCTION

This Appendix serves as a guide to all Evaluation Panel members who are appointed by the EAC, on their responsibilities and conduct during the accreditation exercise. It must be adhered to strictly in order to ensure consistency between one Evaluation Panel and another in terms of evaluation and final recommendation. The Guidelines have been developed based on the IEM Accreditation Handbook for Engineering Degrees: Volumes 1 & 2 and Buku Penilaian Kursus Pengajian IPTS and LAN, and improved further based on feedback from Washington Accord Mentors and relevant stakeholders, the EAC, the IHL and industry. Regular improvements will be made based on new developments and experiences.

2. PREPARATION FOR ACCREDITATION VISIT

2.1 The Evaluation Panel needs to be aware of the EAC policies on accreditation as detailed in Section 6 of this Standard.

2.2 The Evaluation Panel members shall read the programme documentation carefully, with a view to ensuring that it provides the necessary information sought by the EAC in the prescribed format.

2.3 The Evaluation Panel will assess the Programme Objectives and Outcomes as well as carry out an evaluation based on all the accreditation Criteria 1 to 7 set forth in Section 8 of this Standard. The assessment includes the auditing and confirmation of documents submitted by the IHL. If the documents submitted are not complete, the Evaluation Panel shall request for the additional information through the EAD

2.4 This Guidelines for Evaluation Panel is a useful tool for ensuring that every important aspect of a degree programme and its delivery are assessed and reported on. However, it should be remembered that the aim of the accreditation is to determine whether a degree programme meets the academic requirements of the EAC.

2.5 The Head of Panel (HoP) and the Evaluation Panel members, either together or separately, should prepare a list of questions for each section of the criteria to be certain that all aspects of the criteria have been addressed. If the IHL does not provide sufficient information, the EAD should be notified and asked to request for the additional information from the IHL. When the information is received, it should be forwarded to the HoP and Evaluation Panel members. It is highly desirable for the Evaluation Panel to meet face to face and/or communicate by phone and/or on-line (pre-accreditation visit meeting) regarding issues associated with the evaluation before the final Day (-1) meeting. Issues related to curriculum should have been cleared before the Day (-1) meeting.

3. DURING VISIT

3.1 Experience indicates that the success and credibility of an accreditation visit is shaped by:

- the professionalism and ***prior preparation*** of the Evaluation Panel and the rigour and objectivity of on-site enquiries and the report;
- the quality of feedback provided to the IHL by the Evaluation Panel; and
- timeliness of report to the EAC.

3.2 The visit schedule should allow time for group discussion among all Evaluation Panel members for preliminary feedback and discussion of issues with the Dean and/or Head of the Faculty/School/Department/Programme.

3.3 Typical Schedule

Accreditation: Day Minus One (-1)	
Time	**Description**
20:00 – 23:00	Private Session Evaluation Panel Meeting

3.4 A day before the accreditation visit, the HoP and Evaluation Panel members should hold a further meeting to finalise their findings and other issues related to the institutional programme to be evaluated. It is also important to review the questions and concerns that they have raised. At this meeting, the HoP and Evaluation Panel members should discuss the EAC evaluation criteria and how they apply to the programme being evaluated.

The discussion should include, but not be limited to the following:

i. Solving of complex engineering problems is demonstrated.
ii. Programme objectives and outcomes
iii. The development, review and attainment programme outcomes are shared with the relevant stakeholders
iv. The outcome specification drives a top-down educational design process
v. The academic curricular reflects a professional engineering programme, and whether it satisfies the criteria completely
vi. The learning outcomes and assessment measures within courses systematically track delivery of the targeted graduate outcomes
vii. The mathematics and natural sciences, courses are at appropriate levels
viii. The content of each course is appropriate
ix. The level of course materials is appropriate
x. The prerequisite requirements for courses are appropriate and met
xi. The teaching-learning process includes appropriate assessment
xii. The industrial training and project work are at a sufficient level
xiii. Students' standing in terms of their admission standards, academic performance, and industrial training
xiv. The academic and support staff in terms of their credentials and qualifications, range of competencies, industrial experience, teaching loads, and their involvement in professional bodies, etc.
xv. The facilities are appropriate for the programme and operational; whether there is sufficient laboratory space for the programme, and whether safety is a theme conveyed in the laboratories, etc.
xvi. The quality management system is adequate for the programme
xvii. The external examiner/advisor report is appropriate
xviii. Networking with the relevant industries is available and sufficient
xix. The CQI is properly implemented at both programme and individual course levels.

3.5 These matters should be discussed by the Evaluation Panel to ensure that they are all in agreement with the issues to be investigated during the accreditation visit and that they are used as a basis for finalising proposed questions or themes for questioning during the various visit sessions. A proposed schedule for the evaluation visit is provided below. It should be noted that the objective is to be efficient with the time available, and to ensure that all of the questions and issues are addressed.

Accreditation Visit: Day One (1)	
8:30 - 8:45	**Private Session** Evaluation Panel Meeting
8:45 – 09:00	Evaluation Panel briefing to the IHL Opening Remarks and Briefing by the EAC Head of Delegation (HoD) on the objective of accreditation visit to the IHL
9:00 – 9:30	Welcoming Remarks/Presentation by Top Management of the IHL (Vice Chancellor/Rector/Dean/Head)
09:30 – 11:00	Evaluation Panel Meeting to review displayed documents (If necessary, academic staff will be called upon for discussions or to respond to any queries)
11:00 – 13:00	Meeting with (Dean/Head of Department /Head of Programme) to discuss OBE assessment processes, curriculum design and Quality Management System (QMS)
13:00 – 14:00	Evaluation Panel Meeting to review displayed documents (includes a working lunch)
14:00 – 16:00	Meeting with students
16:00 – 17:00	Meeting with external stakeholders (employers, WBL partner industry, alumni, industry advisors/programme advisors) (includes a refreshments)
20:00 – 23:00	**Private Session** Evaluation Panel Meeting

3.6 Throughout the discussions with the administrators, academic staff, students, and support staff, the Evaluation Panel should confirm that an outcome-based approach to education is implemented by the IHL.

3.7 Meetings with alumni, employers, and other stakeholders are important, as this would give an indication of their involvement in the CQI process of the programme.

Accreditation Visit: Day Two (2)	
08:30 – 10:00	Evaluation Panel Visit to engineering laboratories and associated facilities
10:00 – 11:30	Evaluation Panel Meeting with Academic Staff/technical/administrative staff (additional meeting with academic staff /WBL industry mentor and/or students may also be arranged)
11:30 – 12:30	Evaluation Panel Review of examinations, course materials and student work (includes a morning tea)
12:30 – 15:00	**Private Session** Evaluation Panel Meeting to review displayed documents (includes a working lunch)
15:00 – 15:30	Evaluation Panel Meeting with Head of Department/Programme Coordinator
15:30 – 16:30	**Private Session** Evaluation Panel Meeting to revise draft exit notes (includes a refreshment)
16:30 – 17:00	Exit meeting with the IHL Senior leadership team
20:00 – 23:00	**Private Session** Evaluation Panel Meeting

4. EVALUATION PANEL REPORT GENERAL STATEMENT

4.1 It is expected that all the IHL will strive to achieve and maintain the highest standards. Thus, the quality control aspect has to be audited by the Evaluation Panel.

4.2 The Evaluation Panel is to evaluate the submitted documents and check on the relevant sections of Appendix C (Checklist of Documents for Accreditation/ Provisional Accreditation and Relevant Information).

4.3 The Evaluation Panel is to prepare a report as per Appendix D (Evaluation Panel Report). Appropriate comments and remarks shall be made based on the assessment, which includes checking and confirmation of the documents submitted by the IHL.

4.4 The Evaluation panel report (Appendix D) shall:

i. State whether the programme meets EAC requirements.
ii. Where appropriate, provide constructive feedback in the report, which may include strengths, concerns and even weaknesses. Suggestion for opportunities for improvement should be given in the report.
iii. In the event of adverse comments, provide a judgement as to the seriousness, any remedial action proposed or required, the time frame for the remedial action, and whether accreditation should be recommended, deferred or declined.
iv. Make clear and unequivocal recommendations to the EAC.

4.5 The Evaluation Panel report should be forwarded to the EAD within the timeline as pre-determined by the EAC.

4.6 For full accreditation, there should not be any weakness for any criterion (Section 8.1 to 8.7). Before proceeding with the thorough evaluation of the criteria, the Evaluation Panel must ensure that the following qualifying requirements have been met by the programme:

i. A minimum of 135 SLT credits of which 90 SLT credits must be engineering courses offered over a period of four (4) years.
ii. Integrated Design Project (IDP).
iii. Final Year Project (FYP) (minimum six (6) SLT credits).
iv. Industrial training (minimum of eight (8) weeks).
v. Full-time academic staff (minimum of eight (8)) with at least three (3) Professional Engineers registered with the BEM or its equivalent.
vi. Academic Staff: student ratio 1: 20 or better.
vii. External Examiner/Advisor report. (one (1) in every two (2) years)
viii. Programme Educational Objectives (PEO) and Programme Outcomes (PO)

If any of the requirements above are not complied with, the application for accreditation shall be rejected.

5. GUIDE FOR PANEL ASSESSMENT AND EVALUATION

The Evaluation Panel will carry out the assessment based on the expectations set forth in Section 8.1 to 8.7 for all the seven (7) criteria.

<table>
<tr><th colspan="2">CRITERION 1 – PROGRAMME EDUCATIONAL OBJECTIVES</th></tr>
<tr><th>STANDARD REFERENCE</th><th>GUIDE FOR EVALUATION</th></tr>
<tr><td>Section 8.1
Programme Educational Objectives</td><td>
An engineering programme seeking accreditation shall have published Programme Educational Objectives (PEO) that are consistent with the mission and vision of the IHL, and are responsive to the expressed interest of various groups of programme stakeholders. The PEO with appropriate performance indicators must be considered in the design and review of curriculum in a top down approach.

The following are examples of performance indicators expected for Programme Objectives:
• Defined, measurable and achievable
• Linked to Programme Outcomes
• Have own niche
• Published and publicised
• Consistent and linked to mission & vision of IHLs and stakeholder needs
• Linked to curriculum design
• Reviewed and updated
• Established process for assessing and evaluating achievement of PE
• Evaluation results are used in CQI of the programme
• Stakeholder involvement

The process of establishing the educational objectives should be evaluated by the Evaluation Panel by examining the evidence provided by the programme. The following guidelines are recommended for evaluation:

<table>
<tr><th colspan="2">Performance Level
(Indicative Guide)</th></tr>
<tr><td>Unsatisfactory</td><td>Fails to address the performance indicators</td></tr>
<tr><td>Satisfactory</td><td>Addresses most of the performance indicators</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="2">CRITERION 2 - PROGRAMME OUTCOMES</th></tr>
<tr><th>STANDARD REFERENCE</th><th>GUIDE FOR EVALUATION</th></tr>
<tr><td>Section 8.2
Programme Outcomes</td><td>
An engineering programme seeking accreditation must have published Programme Outcomes that have been formulated considering items (i) to (xi) given in Section 8.2 of the Manual Standard, and/or any added outcomes by the programme that can contribute to the achievement of its stated Programme Objectives. The Programme Outcomes must be shown to be linked to the Programme Objectives.
The following performance indicators are expected for Programme Outcomes:

Covers (i) to (xi) of Section 8.2
Linked to Programme Objectives
Defined, measurable and achievable
Detailed out and documented
Published
Consistent and tied to Programme Objectives
Outcomes in line with national needs
Reviewed and updated

Evaluation shall be based on the following:
<table>
<tr><th colspan="2">Performance Level
(Indicative Guide)</th></tr>
<tr><td>Unsatisfactory</td><td>Fails to address the performance indicators</td></tr>
<tr><td>Satisfactory</td><td>Addresses most of the performance indicators</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="2">CRITERION 2 - PROGRAMME OUTCOMES</th></tr>
<tr><th>STANDARD REFERENCE</th><th>GUIDE FOR EVALUATION</th></tr>
<tr><td>Section 8.2
Processes and Results</td><td>
The programme shall also establish a process of measuring, assessing and evaluating the degree of achievement of Programme Outcomes. The results of this assessment process shall be applied for continual improvement of the programme.
The following performance indicators are expected for Processes and Results:

Processes for all elements of criteria are quantitatively/qualitatively understood and controlled
Processes are clearly linked to mission, Programme Objectives, and stakeholder needs
Systematic evaluation and process improvement in place
CQI involved support areas
Processes are deployed throughout the programme, faculty, and IHLs
Sound and highly integrated system
Common sources of problems understood and eliminated
Sustained results
Results clearly caused by systematic approach

Evaluation shall be based on the following:
<table>
<tr><th colspan="2">Performance Level
(Indicative Guide)</th></tr>
<tr><td>Unsatisfactory</td><td>Fails to address the performance indicators</td></tr>
<tr><td>Satisfactory</td><td>Addresses most of the performance indicators</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="2">CRITERION 2 - PROGRAMME OUTCOMES</th></tr>
<tr><th>STANDARD REFERENCE</th><th>GUIDE FOR EVALUATION</th></tr>
<tr><td>Section 8.2
Stakeholders Involvement</td><td>
The IHL shall produce evidence of stakeholder involvement in the programme with regard to Section 8.2 of the Standard.

The following performance indicators are expected for relevant Stakeholder Involvement:

• In defining Programme Outcomes statements
• In assessing the achievement of Programme Outcomes
• In assessing improvement cycles (CQI)
• Involved in strategic partnership

The involvement of stakeholders should be of prime importance for the programme. The Evaluation Panel shall examine the relationship established between the programme and the intended stakeholders. Evaluation shall be based on the following:
<table>
<tr><th colspan="2">Performance Level
(Indicative Guide)</th></tr>
<tr><td>Unsatisfactory</td><td>Fails to address the performance indicators</td></tr>
<tr><td>Satisfactory</td><td>Addresses most of the performance indicators</td></tr>
</table>
</td></tr>
</table>

CRITERION 3 – ACADEMIC CURRICULUM	
ASPECTS	**GUIDE FOR EVALUATION**
Programme Structure, Course Contents, and Balanced Curriculum	The academic curriculum and curricular design shall strongly reflect the philosophy and approach adopted in the programme structure. The programme structure shall be appropriate to, consistent with, and shall support the attainment or achievement of the Programme Outcomes. Emphasis on the curriculum shall be placed on the understanding and acquisition of basic principles and skills of a discipline, rather than memorisation of facts and details. The curriculum shall also provide students with ample opportunities for analytical, critical, constructive, and creative thinking, and evidence-based decision making. The curriculum shall include sufficient elements for training students in rational thinking and research methods and other Programme Outcomes listed by the programme. Co-curriculum activities must be designed to enrich student experiences, foster personal development and prepare them for responsible leadership. For each course, the title shall be suitable, and the pre-requisites shall be mentioned and appropriate in terms of content. The course content and core materials etc. shall cover each component specified in **Appendix B** to an appropriate breadth and depth, and shall be adequate and relevant to the Programme Outcomes. The curriculum shall encompass the complex problem solving, complex engineering activities and knowledge profile as summarised in the same appendix. Adequate time shall be allocated for each component of the content/course, including the elective courses. The sequence of contents shall be appropriate and updated to keep up with the scientific, technological and knowledge development in the field, and to meet the needs of society. There shall be mechanisms for regularly identifying topics of contemporary importance at local, national and global levels and topics that may not be adequately addressed in the curriculum. The curriculum content shall cover: • mathematical techniques, technical subjects, co-curriculum subjects and technical communication subjects; • technical proficiency in a major field of engineering, including the ability to tackle a wide variety of practical problems; • a professional attitude towards matters such as design reliability and maintenance, product quality and value, marketing and safety; • skills in oral and written communication; and • appropriate exposure to professionalism, codes of ethics, safety and environmental considerations. The curriculum shall be balanced and includes all technical and non-technical attributes listed in the Programme Outcomes. Electives are encouraged, monitored, and appraised. The proportion of electives shall not exceed the core subjects and shall preferably offer wide options. The curriculum integrates theory with practice through adequate exposure to laboratory work and professional engineering practice.

Programme Delivery and Assessment Methods	The programme delivery and assessment methods shall be appropriate to, consistent with, and shall support the attainment or achievement of the Programme Outcomes. Alongside traditional methods, other varieties of teaching-learning (delivery) modes, assessment and evaluation methods shall be designed, planned and incorporated within the curriculum to enable students to effectively develop the range of intellectual and practical skills, as well as positive attitudes as required in the Programme Outcomes. The assessment to evaluate the degree of the achievement of the outcomes by the students shall be done both at the programme as well as at course levels. The teaching-learning methods shall enable students to take full responsibility for their own learning and prepare them for life-long learning. The Evaluation Panel is to find out from staff members and students the opportunities provided for interaction and group learning. Tutorials must be supervised, and attendance made compulsory. Sufficient contact hours must be allocated for consultation and interaction between staff members and students. Staff members can be full time academic staff members at the remote campuses, or qualified engineers from the industry. Tutorials, group learning, interaction and innovative educational experience are designed to complement lectures. Tutorial and all other delivery approaches are part and parcel of the programme so as to complement the lectures. A tutorial session should preferably not exceed 30 students at any one time. The Evaluation Panel shall ascertain if the continuous assessment components demonstrate the depth of knowledge that satisfies the condition for passing courses.
Laboratory	Laboratory reports shall be checked by the Evaluation Panel. The assessment of laboratory reports shall have been done through a systematic manner. There must be proper laboratory supervision by academic staff members or qualified engineers from the industry. Students shall receive sufficient laboratory work to complement engineering theory that is learnt through lectures. The laboratory should help students develop competence in executing experimental work. Students need to work in groups, not exceeding five (5) in a group. The laboratory works shall also involve open-ended exercises. Laboratory exercises shall be relevant and adequate, illustrative, and promote development of instrumentation skills. Inspection of reports needs to show that the required outcomes have been achieved.

Final Project/Design Project	The final year project report shall be checked by the Evaluation Panel. The assessment shall have been done through a systematic manner. The appropriateness of the project topics in relation to the degree programme is to be monitored. It is proposed that at least 9 reports are to be examined by the Evaluation Panel (three (3) from the best group, three (3) from the middle group and three (3) from the poor group). The supervisors of the Projects must be academic staff members or qualified Engineers from the industry. The place where the projects are conducted should have the facilities to support the projects. The final year project is compulsory for all students and demands individual analysis and judgement, and shall be assessed independently. The student is shown to have developed techniques in literature review and information prospecting. It provides opportunities to utilise appropriate modern tools in some aspect of the work, emphasising the need for engineers to make use of computers and multimedia technology in everyday practice.
Integrated Design Project	The assessment shall have been done through a systematic manner. The appropriateness of the project topics in relation to the degree programme is to be ascertained. It is proposed that at least 9 reports are to be examined by the Evaluation Panel (three (3) from the best group, three (3) from the middle group and three (3) from the poor group). The facilitator/coordinator of the Projects must be qualified academic staff with relevant experience. The projects must be supported with relevant resources and facilities. Integrated Design Projects/Capstone Projects shall involve complex problem solving and complex engineering activities which include design systems, components or processes integrating (culminating) core areas; and meeting specific needs with appropriate consideration for public health and safety, cultural, societal, project management, economy, and environmental considerations where appropriate. The capstone project should involve students working in group. The programme may take the opportunity to assess many relevant programme outcomes through capstone project.
Industrial Training	Exposure to professional engineering practice in the form of an industrial training scheme is compulsory for minimum of eight (8) weeks continuously. The industrial training is shown to have exposed students and to have made them familiar with relevant engineering practices. Students should be placed in relevant organization and undergo structured training supervised by qualified person. The IHL shall put in place a system to monitor and assess the industrial training. It is proposed that at least 9 reports are to be examined by the Evaluation Panel ((three (3) from the best group, three (3) from the middle group and three (3) from the poor group)).
Exposure to Professional Practice	Exposure to engineering practice is integrated throughout the curriculum. It has been obtained through a combination of the following: (a) Lectures/talks by guest lecturers from industry (b) Academic staff with industrial experience (c) Courses on professional ethics and code of conduct (d) Industry visits and/or industry exhibition (e) Industry-based project and/or industry related competition; and (f) Regular use of a logbook in which industrial experiences are recorded

<table>
<tr><th colspan="2">CRITERION 4 – STUDENTS</th></tr>
<tr><th>ASPECTS</th><th>GUIDE FOR EVALUATION</th></tr>
<tr><td>Entry requirements (Academic)</td><td>The entry requirement to the programme shall be evaluated to ensure that the students accepted have the minimum qualifications required for training and education as an engineer.</td></tr>
<tr><td>Admission, Credit Transfer and Credit Exemption Policies</td><td>The IHL shall develop a clear, documented and enforced policy on admission and transfer of students. The policy shall take into account the different backgrounds of students in order to allow alternative educational pathways. The exemptions of credit hours shall be based on justifiable grounds. A maximum Credit Exemption of 30% of the total programme credits is allowed for accredited/recognized Diploma to Bachelor degree; and a maximum Credit Transfer of 50% of the total programme credits is allowed between accredited/recognised from Bachelor to Bachelor degree.

Total credit exemption and credit transfer should not exceed 50% of the total programme credits.</td></tr>
<tr><td>Student Counselling</td><td>IHLs shall provide counselling services to students regarding academic and career matters, as well as provide assistance in handling health, financial, stress, emotional and spiritual problems.</td></tr>
<tr><td>Workload</td><td>Students shall not be over-burdened with workload that may be beyond their ability to cope with. Average Credits per 14-week semester:

<table><tr><th colspan="2">Performance Level
(Indicative Guide)</th></tr><tr><td>Unsatisfactory</td><td>20 or more</td></tr><tr><td>Satisfactory</td><td>Less than 20</td></tr></table></td></tr>
<tr><td>Enthusiasm and Motivation</td><td>The teaching-learning environment shall be conducive to ensure that students are always enthusiastic and motivated.</td></tr>
<tr><td>Co-curricular activities</td><td>IHLs shall also actively encourage student participation in co-curricular activities and student organisations that provide experience in management and governance, representation in education, competitions and related matters and social activities. These involvements can be towards attainment of the relevant PO if the IHL designed them to be part of the process. Evaluation Panel should consider these.</td></tr>
<tr><td>Observed attainment of Programme Outcomes by students</td><td>The Evaluation Panel is to get a first-hand feel of the students' achievement of the PO by interviewing and observing them at random to triangulate various aspects of the attainment.</td></tr>
</table>

CRITERION 5 – ACADEMIC AND SUPPORT STAFF	
ASPECTS	**GUIDE FOR EVALUATION**
A. ACADEMIC STAFF **Adequacy of Academic Staff**	There must be a minimum of eight (8) full-time academic staff relevant to the particular engineering discipline. The staff shall be sufficient in number and competencies to cover all curricular areas.
Academic Qualification	At least 60% of the staff members are full-timers, with the majority having PhD in appropriate areas.
Professional Qualification	Each programme shall have at least three (3) full-time Professional Engineers registered with the Board of Engineers Malaysia or equivalent at all times and actively engaged in the programme. For programmes with a total student enrolment exceeding 160, at least 30% of the full time and actively teaching engineering academic staff shall be registered with the BEM as Professional Engineers or equivalent. Staff Members are also encouraged to attain other professional qualifications and be active.
Research/ Publication	Academic Staff members should be given opportunities to conduct research. The IHL should have provision for research grants for the staff members. Research Output includes recent publication in conferences/refereed journals and patents.
Industrial Involvement/ Consultancy	The Evaluation Panel is to assess whether the staff members are involved in appropriate consultancy, collaborations, advisory and engagements with the industry and relevant organisations.
Teaching Load	Average teaching load (teaching hours per week): 12 – 15 (satisfactory), >15 (unsatisfactory). The Evaluation Panel shall triangulate the teaching load assessment with the academic staff during the interview.
Motivation and enthusiasm	The Evaluation Panel is to have a separate meeting with faculty staff members to assess their motivation and enthusiasm.
Use of lecturers from industry/public bodies	The Faculty is encouraged to invite engineers from industry and professional bodies to deliver seminars/lectures/talks to students.
Awareness of the Outcome-Based approach to education	The Evaluation Panel is to assess staff ability to implement the Outcome-Based approach to education.

<table>
<tr><th colspan="2">CRITERION 5 – ACADEMIC AND SUPPORT STAFF</th></tr>
<tr><th>ASPECTS</th><th>GUIDE FOR EVALUATION</th></tr>
<tr><td>B. SUPPORT STAFF

Qualification</td><td>Certificates, diplomas and degrees in the relevant areas:

<table><tr><td>>80% of staff</td><td>Good</td></tr><tr><td>60% - 80%</td><td>Satisfactory</td></tr><tr><td>< 60%</td><td>Unsatisfactory</td></tr></table></td></tr>
<tr><td>Adequacy of support staff</td><td>The Evaluation Panel may use his/her discretion when a large laboratory/workshop is evaluated. The objective is to ensure that the laboratories and workshops are well maintained, and equipment is functioning for the learning purposes.

<table><tr><td>1 Technical Staff Member to 1 Laboratory</td><td>Good</td></tr><tr><td>1 Technical Staff Member to 2 Laboratories</td><td>Satisfactory</td></tr><tr><td>1 Technical Staff Member to more than 2 Laboratories</td><td>Unsatisfactory</td></tr></table></td></tr>
<tr><td>C. DEVELOPMENT OF STAFF

Staff Development</td><td>The IHL shall systematically plan and provide appropriate training, sponsorship for postgraduate studies/ sponsorship for conferences, sabbatical leave etc. for academic staff.

Similarly, for support staff, the IHL shall provide the opportunities for them to upgrade their competencies through training and practical exposure.</td></tr>
<tr><td>Staff Assessment</td><td>The IHL shall incorporate annual assessment of staff performance which takes into account participation in professional, academic and other relevant bodies as well as community involvement.

Similarly, the IHL shall also establish a working system for evaluation/feedback by students on matters relevant to their academic environment.</td></tr>
<tr><td>Academic Staff: Student Ratio</td><td>The Evaluation Panel shall evaluate the ratio of academic staff: student for the programme for the last four (4) academic sessions. The following guide shall be used for evaluation.

<table><tr><td>1:20 or better</td><td>Satisfactory</td></tr><tr><td>Poorer than 1:20</td><td>Unsatisfactory</td></tr></table></td></tr>
</table>

<table>
<tr><th colspan="2">CRITERION 6 – FACILITIES</th></tr>
<tr><th>ASPECTS</th><th>GUIDE FOR EVALUATION</th></tr>
<tr><td></td><td>Facilities in terms of lecture rooms, laboratory facilities, library/resource centre, eateries and general facilities should be available and accessible to the students.
In the case of off-campus/distance-learning mode, the Evaluation Panel should comment on whether the facilities are equivalent to those provided for the on-campus students. In the case where the students are sent to the main campus to complete the experiments over a short period of time rather than being spread out (as in the case of the main campus), the Evaluation Panel should comment on the effectiveness of such a practice in the report after interviewing the students.</td></tr>
<tr><td>Lecture rooms - quantity provided and quality of A/V</td><td>(a) Lecture Rooms – Quantity and Quality (in terms of furniture, environment and AV Equipment)<table><tr><td>Adequate</td><td>Satisfactory</td></tr><tr><td>Inadequate</td><td>Unsatisfactory</td></tr></table></td></tr>
<tr><td>Laboratory / Workshop - Student Laboratory and Equipment</td><td>Laboratory/Workshop – Laboratory facilities should be examined to ensure there are sufficient facilities and equipment, and in working order to cater for the students.
Average Student Number per Laboratory Experiment:<table><tr><td>≤ 5</td><td>Satisfactory</td></tr><tr><td>> 5</td><td>Unsatisfactory</td></tr></table></td></tr>
<tr><td>IT/Computer Laboratory/Modern Tools - Adequacy of Software</td><td>IT/Computer Laboratory/Modern Tools
Accessibility and Adequacy<table><tr><td>Available, accessible and adequate for teaching and learning activities</td><td>Satisfactory</td></tr><tr><td>Not available and not accessible</td><td>Unsatisfactory</td></tr></table></td></tr>
<tr><td>Library / Resource Centre - Quantity of Books Provided</td><td>The IHL is to have sufficient, relevant and recent titles of online/hardcopies of text and reference books, standards and journals to support teaching and research for the programme evaluated.
For off-campus/distance-learning mode, the Evaluation Panel should comment on how the learning materials are made available and accessible to the students.<table><tr><td>Available and accessible</td><td>Satisfactory</td></tr><tr><td>Not available and not accessible</td><td>Unsatisfactory</td></tr></table></td></tr>
</table>

<table>
<tr><th colspan="2">CRITERION 7 – QUALITY MANAGEMENT SYSTEMS</th></tr>
<tr><th>ASPECTS</th><th>GUIDE FOR EVALUATION</th></tr>
<tr><td></td><td>Unless stated otherwise, the evaluation should follow this scale:
<table><tr><td>Adequate</td><td>Satisfactory</td></tr><tr><td>Inadequate</td><td>Unsatisfactory</td></tr></table></td></tr>
<tr><td>A. Institutional Support, Operating Environment, and Financial Resources

Quality and Continuity of the Programme</td><td>The Evaluation Panel should examine the evidence provided by the Faculty/IHL on whether institutional support and financial resources are sufficient to ensure programme quality and continuity. Support from external bodies should be encouraged.</td></tr>
<tr><td>Attract and Retain a Well-Qualified Academic and Support Staff</td><td>The Evaluation Panel should examine the evidence provided by the Faculty/IHL on whether the institutional support and financial resources are sufficient for the programme to attract and retain well-qualified academic and support staff. Support from external bodies should be encouraged.</td></tr>
<tr><td>Acquire, Maintain, and Operate Facilities and Equipment</td><td>The Evaluation Panel should examine the evidence provided by the Faculty/IHL on whether the institutional support and financial resources are sufficient for the programme to acquire, maintain and operate facilities and equipment. Support from external bodies should be encouraged.</td></tr>
<tr><td>B. Programme Quality Management and Planning

System for Programme Planning, Curriculum Development, and Regular Curriculum and Content Review</td><td>The Evaluation Panel should assess the effectiveness of the overall CQI process being used in the programme. Generally, the Evaluation Panel will assess whether there are proper and sufficient policies/rules/regulations/ procedures in the Department/ Faculty or IHL, and whether those systems are implemented. Quality systems used in the IHL can be highlighted. Other forms of implementation for quality purposes such as external examiners, board of studies, and benchmarking shall also be evaluated.</td></tr>
<tr><td>C. External Assessment and Advisory System

External Examiner/Advisor Report</td><td>The programme shall appoint an external examiner to assess the overall quality of the programme. The Evaluation Panel shall examine the External Examiner/Advisor reports and determine whether the recommendations by the examiners have been implemented by the programme to improve overall quality. The format of the report is according with Appendix E of this Standard.

External Examiner/Advisor evaluation is to be made at least once in every two (2) academic years.</td></tr>
</table>

Industry Advisory Panel and other Relevant Stakeholders	The programme shall have a specific and effective IAP with members officially appointed with Terms of Reference (ToR) and period from industry and/or other relevant stakeholders. The programme shall provide evidence of meetings and dialogues with the IAP and the extent of their involvement in terms of quality improvement. IAP meeting shall be conducted at least once a year and properly documented.
D. Quality Assurance **System for Examination Regulations including Preparation and Moderation of Examination Papers**	The IHL shall establish an effective system for examination regulations including preparation and moderation of examination papers.
System of Assessment for Examinations, Projects, Industrial Training	The IHL shall establish an effective system for assessment of examinations, projects, industrial training and other assessments. The scope and tools of assessment shall be coherent to measure the achievement of programme outcomes.
E. Safety, Health and Environment **System for managing and implementation of safety, health and environment**	The IHL shall demonstrate that it has put in place an effective policy, system and resources for managing and implementation of safety, health and environment requirements for all the facilities teaching and safety equipment. The practice related to safety, health and environment must be apparent among staff and students.

6. DISTANCE LEARNING/ OFF-CAMPUS PROGRAMMES

6.1 The quality of the environment in which the programme is delivered is regarded as paramount in providing the educational experience necessary for engendering independence of thought of its graduates.

6.2 There must be adequate classrooms, learning support facilities, study areas, information resources (resource centres or libraries), computing and information technology systems, and general infrastructure to meet the programme's objectives. These facilities must enable students to learn the use of modern engineering, organisational and presentation tools, and explore beyond the formal dictates of their specific programme of study.

6.3 For programmes offered partly in distance mode or at multiple or remote locations, communication facilities must be sufficient to provide students with the learning experience and support equivalent to on-campus attendance. There must also be adequate facilities for student-student and student-staff interactions.

6.4 Laboratories and workshops should be adequately equipped for experiments and "hands-on" experience in the areas of engineering subjects. Adequate experimental facilities must be available for students to gain substantial understanding and experience in operating engineering equipment and of designing and conducting experiments. The equipment must be reasonably representative of modern engineering practice. Where practical work is undertaken at another IHL, or in industry, arrangements must be such as to provide reasonable accessibility and opportunity for learning, as well as supervision and monitoring by the academic staff.

6.5 In assessing the non-traditional mode of delivery, it is proposed that the Evaluation Panel should give a report that compares the system of the parent IHL (or main campus) and the system in each of the remote locations or branch campuses or distance-learning modes. Assuming the syllabus and examination questions are the same, the following areas need to be addressed in detail (a table of comparisons between the main campus and the remote location/distance-learning mode will be useful):

i. Academic Staff
   - Percentage of the part-time staff and their workload
   - Number of supporting academic staff members for tutorials or interaction with off-campus or distance learning or remote location students
   - Percentage of the staff from main campus and their workload

ii. Student
- Entry requirement
- Selection procedures
- Student counselling
- Exposure to Industry
- Enthusiasm and motivation
- Workload
- Interaction with other students
- Interaction with academic staff

iii. Facilities available at the Remote Location
- Lecture rooms and AV facilities
- Laboratory/workshop
- IT/computer and adequacy of software
- Library resources
- Recreation facilities

iv. Quality Control
- Assessment of coursework
- Final Examination and grading
- Moderation or Quality Assurance Process by the main campus

6.6 Evaluation Panel visit is required for each remote location (preferably by the same Evaluation Panel that assesses the degree programme at the main campus).

Appendix I

List of Documents to be Made Available During the Visit

A. Programme Educational Objectives (PEO)

i. Samples of responses to questionnaires/surveys and/or other tools used to establish, review and evaluate the attainment of the PEO
ii. Extract of minutes of meeting and/or feedback from stakeholders
iii. Documents related to CQI actions for example minutes of meetings, training lists and documents, workshop reports, briefing notes, reminders, relevant forms, and internal communications, instructions, etc.

B. Programme Objectives (PO)

i. Evidences of methodology used to establish and review POs.
ii. Samples of direct and indirect assessments for attainment of POs.
iii. Documents related to CQI actions for example extracts of minutes of meetings and/or feedback from stakeholders, training lists and documents, workshop reports, briefing notes, reminders, relevant forms, and internal communications, instructions, etc.

C. Academic Curriculum

i. List of the experiments, including open-ended experiments
ii. List of companies for industrial training attached.
iii. List of Final year project titles
iv. List of Integrated Design Project titles
v. List of activities that support students' exposure to professional practice. This can include industrial talk, industrial visit, IDP and FYP collaboration, class-industry collaboration etc.
vi. Evidence of implementation of Criteria for Passing Courses Documents related to CQI actions for example extracts of minutes of meetings and/or feedback from stakeholders, training lists and documents, workshop reports, briefing notes, reminders, relevant forms, and internal communications, instructions, etc.

D. Students

i. Student admission policy and processes including samples of how it is being implemented
ii. Credit transfer/exemption policy and processes including samples of how it is being implemented
iii. Samples of student feedback
iv. List of student involvement in student organisations and relevant professional engineering bodies that provide experience in management and governance, representation in education and related matters.
v. List of non-academic or co-curricular activities, and social activities
vi. Documents related to CQI actions

E. Academic and Support Staff

i. List of OBE/professional skill/technical training, etc. for academic and support staff
ii. Academic staff's Professional Engineer/ Engineering Technologist certificate and any other related competency certificates
iii. Support staff's competency certificates
iv. List of consultancy, research and development activities by the academic staff
v. Professional development plan
vi. Documents related to CQI actions

F. Facilities

i. List of all equipment and software, library resources used in the programme
ii. Record of maintenance, and calibration of facilities and equipment/apparatus in the laboratories or elsewhere
iii. Implementation of best practices for safety, health and environment for all facilities
iv. Documents related to CQI actions

G. Quality Management Systems (QMS)

i. Policies that are relevant to Quality Management System (QMS)
ii. Sample course files ranging from year one (1) to four (4)
iii. Relevant minutes of meeting related to QMS
iv. Policies, procedures and monitoring of health, safety and environmental aspects of facilities
v. Letters of appointment of IAP and External Examiner/Advisor
vi. External Examiner/Advisor reports (the latest 2 reports)
vii. IAP minutes of meeting (including programme specific)
viii. Benchmarking reports
ix. Documents related to CQI action.

Appendix J

List of evidences or documents that may be made available for verification during the accreditation visit

i. The IHL/programme's handbook, undergraduate prospectus, academic calendar or other official publications relating to the faculty/school/department, and containing the statement of programme details; IHL prospectus; and any other documents that relate to the faculty/school/department, and programme.
ii. Completed questionnaire survey forms.
iii. Documents related to IAP activities.
iv. Documents related to training workshops related to OBE and Curriculum development.
v. OBE user manual.
vi. PO trays/boxes for each of the 11 EAC's POs.
vii. OBE management software (if any).
viii. Course files – for every course offered by the programme, provide the course information to include the targeted course outcomes, a matrix linking course outcomes to programme outcomes, course synopsis/syllabus, and a list of references (texts used). Examination papers complete with answer scheme and graded examination papers with low, medium and high grades are also to be provided. Any information with regard to other learning activities and assessment measures such as projects, quizzes, tutorial questions, assignments, class projects, copies of the course notes, and any other materials used for the course are also to be included. Sample of projects with low, medium and high grades are also to be provided. Assessment rubrics or projects and non-cognitive outcomes shall be included.
ix. Final year project reports and assessment rubrics, including FYP guidelines, evaluation criteria, grading records and samples of FYP reports with low, medium and high grades.
x. Integrated design projects and assessment rubrics.
xi. Moderation forms for examination papers and other continuous assessments.
xii. Laboratory exercises to include experiment instruction sheets, as well as supporting information, and marked laboratory exercises.
xiii. Laboratory reports with low, medium and high grades.
xiv. Documents related to industrial training (IT)/placement and students' IT report, including grading records by the industry, the faculty mentors and samples of industrial training report with low, medium and high grades where relevant.

xv. Documents related to industrial exposure for students (industrial visit, talks, etc.).
xvi. Documents related to students' feedback.
xvii. Documents related to students' participation in design competition, public speaking activities, etc.
xviii. Documents related to industrial attachment/professional scheme for academic staff.
xix. Documents related to academic staff attending training, conferences and workshops.
xx. Documents related to support staff training.
xxi. Documents related to staff industry linked consultancy activities.
xxii. Documents related to staff industry linked research activities.
xxiii. Documents related to staff promotion exercises.
xxiv. Equipment calibration records.
xxv. Facilities and equipment maintenance records.
xxvi. Documents related to health, safety, and environment.
xxvii. IHL/programme annual report.
xxviii. Published policies.
xxix. External Examiner/Advisor report.
xxx. Benchmarking reports.
xxxi. Minutes of meetings involving all criteria.
xxxii. Other relevant documentation/evidences.

Addendum B (1)

COMPUTING AND INFORMATION TECHNOLOGY (IT) RELATED ACADEMIC PROGRAMME

[(Accreditation of the Engineering Programme with a focus on Computing and Information Technology (IT)]

Unless additional requirements are stated below, all the stipulations outlined in the Engineering Programme Accreditation Standard 2024 remain in effect, and IHL shall adhere to them.

1.0 Introduction

This Standard also includes an Optional Addendum (Addendum B1) that outlines additional requirements for accreditation by Institutions of Higher Learning (IHL) in pursuing accreditation of an engineering programme that focuses on Computing and IT-related qualifications. Addendum B1 contains additional accreditation requirements that a programme needs to fulfil. Addendum B1 is optional and only applicable to IHL that offer engineering programmes focusing on Computing and IT-related qualifications.

2.0 Accreditation Objective

There is no additional requirement to the accreditation objective of the Engineering Programme Accreditation Standard 2024.

3.0 Computing and Engineering Technology

The assertion that computing constitutes a form of engineering, particularly in the context of addressing engineering challenges, is rooted in its integral role across diverse sectors. Serving as an indispensable tool for problem-solving, computing forms the backbone of modern engineering, permeating critical applications where safety and security are paramount. Its ubiquity and criticality solidify its status as an engineering discipline, shaping the landscape of innovation and contemporary problem-solving. The argument supporting the idea that computing is a form of engineering is robust, especially when considering individuals dealing with complex engineering problems. Indeed, the influence of computing extends beyond traditional engineering realms, impacting various facets of business, administration, and non-technical fields like management, education, health, forensics, and security.

In many of these situations, the presence of computing is vital to the extent that the enterprise depends on computing provisions and could not function without them. Through various contributions and technological developments, recent advances in engineering and other areas are credited to computing. In the future, these trends are likely to progress with even greater speed and subsequently greater impact. Building truly useful systems often requires a deep understanding of the domain of use. Acquiring such insight may involve a profound understanding of the application domain, necessitating considerable study. As applications become more sophisticated, this understanding becomes even more crucial. To design, construct, deploy, manage, and maintain such systems effectively and efficiently demands a deep understanding of the relevant principles in the specific context of computer-based systems. The inherent nature of such systems typically calls for an engineering-based design approach, grounded in appropriate scientific and technological insights.

Computing plays a pivotal role in diverse areas by serving as the backbone for numerous applications and systems. Frequently integrated as embedded systems or information systems within engineering devices, computing adds a layer of sophistication to their functionality. Notably, these applications often involve critical elements, such as considerations for safety or security. In essence, computing is not merely a standalone discipline but a dynamic force intertwined with engineering principles, propelling advancements across a wide spectrum of industries. Its application goes beyond technical intricacies, reaching into the fabric of our daily lives and the intricate workings of various professional domains.

4.0 Accreditation Policy

IHL's seeking an accreditation of the engineering programme with a focus on Computing and Information Technology (IT) **are required to clearly state in their written application when applying for accreditation.**

5.0 Accreditation Procedure

Section 6.0 Qualifying Requirements and Accreditation Criteria / Criterion 2 - Programme Outcomes (PO)

Programme Outcomes describe what students are expected to know and be able to perform or attain by the time of graduation. These relate to the skills, knowledge, and behaviour that students acquire through the programme.

Programmes seeking an accreditation of the engineering programme with a focus on Computing and Information Technology (IT) must adhere to this requirement as follows:

i. Students of a programme seeking additional recognition are expected to attain the additional requirements of the Programme Outcomes (PO). The computing-specific details outlined must be observed to ensure that the computing-specific aspects are reflected in the academic curriculum, teaching and learning activities, and assessment.

Section 6.0 Qualifying Requirements and Accreditation Criteria / Criterion 5 – Academic and Support Staff.

A viable programme is expected to have a minimum of eight (8) full-time academic staff relevant to the particular engineering with a focus in computing or IT-related discipline. In addition, IHL may engage part-time staff with acceptable professional qualifications in the related engineering with a focus in computing or IT-related fields. Numbers of part time staff recruited shall not exceed 40% of the total staff. Academic staff shall have postgraduate degrees (Masters level or higher). However, a staff member with a recognised first degree and long industrial/specialist experience with acceptable professional qualifications may be considered.

It must be demonstrated that the academic staff have the competencies to cover all areas of the programme, and are implementing the outcome-based approach to education. The overall competence of the academic staff may be judged by such factors as education, diversity of background, engineering and computing or IT-related experience, teaching experience, ability to communicate, enthusiasm for developing more effective programmes.

The full-time equivalent academic staff to student ratio shall ideally be 1:20 or better to ensure effective teaching, student-staff interaction, student advising and counselling, IHL service and research activities, professional development and interaction with industries.

There shall also be sufficient, qualified and experienced technical and administrative staff to provide adequate support to the educational programme. It is recommended that each technical staff shall be in charge of not more than two laboratories.

7.0 Accreditation Documents

IHL's seeking an additional recognition of tertiary-level computing and IT-related qualifications for their programme are required to clearly state in their written application when applying for accreditation.

Additional documents, as stated in Addendum B (1), must be submitted as part of the accreditation documents.

8.0 Approval Procedure for New Programme

There are no additional requirements to the accreditation procedure as outlined in the Engineering Technology Programme Accreditation Standard 2024.

ENGINEERING PROGRAMME ACCREDITATION STANDARD 2024

Engineering Accreditation Council
Board of Engineers Malaysia

Engineering Programme Accreditation Standard 2024

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