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ENGINEERING TECHNOLOGY PROGRAMME ACCREDITATION STANDARD 2024

Engineering Technology Accreditation Council
Board of Engineers Malaysia

ENGINEERING TECHNOLOGY PROGRAMME ACCREDITATION STANDARD 2024

9th Floor, Kelana Parkview Tower, No. 1, Jalan SS 6/2 Kelana Jaya,
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Engineering Technology Programme Accreditation Standard 2024

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Notes on the period for which this Standard takes effect

1. **Accreditation is accorded based on graduation years for students, not 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, ETAC will allow adequate time for a reasonable transition to take place as justified by the programme.**

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

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Acknowledgements

The Engineering Technology Accreditation Council (ETAC) 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 ETAC is highly appreciated.

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Definitions

Glossary

APEL	-	Accreditation of Prior Experiential Learning
BEM	-	Board of Engineers Malaysia
CoI	-	Conflict of Interest
CO	-	Course Outcomes
COPTPA	-	Code of Practice for TVET Programme Accreditation
CQI	-	Continual Quality Improvement
DKM	-	Diploma Kemahiran Malaysia
DL	-	Dependent Learning (Guided Learning)
DVM	-	Diploma Vokasional Malaysia
EAD	-	Engineering Accreditation Department
EAMS	-	Engineering Accreditation Management System
EE	-	External Examiner
ELT	-	Effective Learning Time
ETAC	-	Engineering Technology Accreditation Council
FTE	-	Full-Time Equivalent
FYP	-	Final Year Project
HoD	-	Head of Delegation
HoP	-	Head of Panel
IAP	-	Industry Advisory Panel
IEM	-	The Institution of Engineers, Malaysia
IG	-	Industrial Guidance

IHL	-	Institutions of Higher Learning (includes public or private universities, and other institutions authorised by legislation to award engineering degrees).
IL	-	Independent Learning
IoW	-	Inspector of Works
ISO	-	International Standard Organization
JPA	-	Jabatan Perkhidmatan Awam (Public Services Department)
MoHE	-	Ministry of Higher Education
MQA	-	Malaysian Qualifications Agency
MQR	-	Malaysian Qualifications Register
OBE	-	Outcome-Based Education (an approach that focuses on outcomes)
OFI	-	Opportunity for Improvement
PEO	-	Programme Educational Objectives
PO	-	Programme Outcomes
QMS	-	Quality Management Systems
SA	-	Sydney Accord
SAR	-	Self-Assessment Report
SK	-	Sydney Accord Knowledge & Attribute Profile
SLT	-	Student Learning Time
SP	-	Sydney Accord Problem Identification & Solving
SPM	-	Sijil Pelajaran Malaysia (Malaysia Certificate of Education)
STPM	-	Sijil Tinggi Persekolahan Malaysia (Malaysia Higher School Certificate of Education)
TA	-	Broadly-defined Engineering Activities
ToR	-	Terms of Reference
WBL	-	Work-Based Learning

General

Accreditation Appeal Board	-	A Board to consider appeals from an Institution of Higher Learning on declined accreditation decision made by ETAC.
Engineering Technologist	-	A person registered under Section 10C(1), Registration of Engineers Act 1967 (Revised 2015).
Evaluation Panel	-	A panel of evaluators appointed by ETAC to verify programme compliance with accreditation criteria.
Evaluator	-	A person appointed by ETAC to evaluate Application for Provisional Accreditation 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(1)(a), Registration of Engineers Act 1967 (Revised 2015).
Head of Delegation	-	An Associate Director of EAD/Senior Evaluator/any suitable representative appointed by ETAC to advise the Evaluation Panel during an accreditation visit.
Inspector of Works	-	A person registered under Section 10(E) Registration of Engineers Act 1967 (Revised 2015).
Professional Engineer	-	A person registered under Section 10(2), Registration of Engineers Act 1967 (Revised 2015).

Institutions of Higher Learning and Programme

Course	-	Subject offered in the programme.
Degree	-	An engineering technology qualification in Malaysia normally titled Bachelor of Engineering Technology.
External Examiner/Advisor	-	A person with high academic standing in relevant field appointed by the IHL to assess academic quality and standard of the programme.
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.
Industry Mentor	-	A qualified and/or competent employee of an industry who is appointed by the industry (employer) and agreed upon by the IHL to teach/guide, mentor and assess WBL students at the workplace.
Programme	-	The sequence of structured educational experience undertaken by the 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 the programme implementation.
Teaching Staff	-	Staff responsible for teaching and learning activities in the programme leading to the award of an engineering or engineering technology diploma.

Accreditation

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.
Accredited Programme	-	An engineering technology programme whose graduates are acceptable for graduate technologist registration with BEM. This is accorded to a programme that satisfies the minimum standard for accreditation set by ETAC.
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. A programme given some conditions to be fulfilled within certain period of time which is shorter than the accorded accreditation period.
Approval	-	Permission from the relevant authorities to conduct a new programme.
Cessation/Termination of Accreditation	-	ETAC 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, ETAC may accord the remaining number of years of accreditation to the programme subject to application by IHL and re-evaluation by ETAC.
Declined Accreditation	-	This is given to a programme that fails to meet the minimum standard for accreditation and has major shortcomings. In such a case, a further application is not normally considered within the next one (1) year.
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 ETAC.
Provisional Accreditation	-	This is given to a programme that has been recommended for approval by BEM to be conducted.

ENGINEERING TECHNOLOGY PROGRAMME ACCREDITATION STANDARD 2024

Engineering Technology 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 any qualification in engineering recognised by the BEM.

The BEM therefore 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 attains 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).

Engineering Technology Accreditation Council (ETAC) is the body delegated by BEM for accreditation of engineering technology degrees and engineering technician qualifications. The ETAC consists of representatives from the BEM, relevant learned societies, related Ministries, related government agencies, and industry employers of Engineering Technologists and Engineering Technicians in Malaysia. The Terms of Reference (ToR) of the ETAC are outlined in Appendix A (Engineering Technology Accreditation Council).

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

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

This Standard also includes an optional addendum (Addendum A) that outlines additional requirements for accreditation by IHL seeking to register their programme as a Technical and Vocational Education and Training (TVET) programme with the Malaysian Qualifications Agency (MQA). Addendum A contains requirements taken from the MQA Code of Practice for TVET Programme (COPTPA).

2.0 Accreditation Objective

The objective of accreditation is to ensure that graduates of the accredited engineering technology programmes satisfy the minimum academic and practice requirements for registration as an engineering technologist 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 technology programmes offered by IHL in Malaysia.

3.0 Engineering Technology

Engineering Technology is that part of the engineering spectrum that requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities.

Engineering has evolved rapidly due to creativity and innovativeness of mankind, resulting in the emergence of engineering technology as a significant discipline within the spectrum. In tandem, Engineering Technology education has also evolved in correlation with the current demands of the industry.

Engineering Technology programmes are oriented towards application, and provide their students with introductory mathematics and science courses, and only an introduction to engineering fundamentals and applied sciences. The graduates are exposed to almost similar courses with those of the engineering curricula but variation in the distribution of theories and practical skills.

Engineering Technologist education and training are application oriented, focusing among others on applied design, product development, manufacturing, product assurance and maintenance based on current engineering practice standard.

Within the engineering team, engineering technologists perform engineering works by applying engineering and scientific knowledge combined with technical skills.

4.0 Programme Educational Objectives (PEO)

Programme Educational Objectives (PEO) are specific goals consistent with the vision and mission of the IHL, are responsive to the expressed interest of 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 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 technology programme are expected to attain the following in the practice-oriented learning environment:

i. **Knowledge:** Apply knowledge of mathematics, natural science, computing and engineering fundamentals and an engineering specialization as specified in SK1 to SK4 respectively to defined and applied engineering procedures, processes, systems or methodologies;

ii. **Problem analysis:** Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation with considerations for sustainable development; (SK1 to SK4)

iii. **Design/ development of solutions:** Design solutions for broadly-defined engineering technology problems and contribute to the design of 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; (SK5)

iv. **Investigation:** Conduct investigations of broadly-defined engineering problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions; (SK8)

v. **Tool Usage:** Select and apply, and recognize limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems; (SK2 and SK6)

vi. **The Engineering Technologist and the World:** Analyze and evaluate sustainable development impacts to: society, the economy, sustainability, health and safety, legal frameworks, and the environment, in solving broadly-defined engineering problems; (SK1, SK5, and SK7)

vii. **Ethics:** Understand and commit to professional ethics and norms of engineering technology practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion; (SK9)

viii. **Individual and Collaborative Team Work:** Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary, face-to-face, remote and distributed settings; (SK9)

ix. **Communications:** Communicate effectively and inclusively on broadly-defined engineering activities with the engineering community and with society at large, by 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 to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments;

xi. **Life Long Learning:** Recognize the need for, and have the ability for i) independent and life-long learning and ii) critical thinking in the face of new specialist technologies. (SK8).

Common Range and Contextual Definitions is given in Appendix B:

- Section (a) Range of Problem Identification and Solving; and
- Section (b) Range of Engineering Activities

An Engineering Technology 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. **Continual Improvement:** The programme must also regularly use appropriate, documented processes for assessing and evaluating the extent to which the PO are being attained. The results of these evaluations must be systematically utilized as input for the continuous improvement of the program. Other available information may also be used to assist in the continuous improvement of the programme.

iii. **Stakeholders' Involvement**: The IHL/faculty shall provide evidence of stakeholders' involvement with regard to Programme Outcomes (PO) and Continual Improvement 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 ETAC's accreditation policy underlying the accreditation process. Accreditation will be considered upon receipt of a written request from the IHL. All applications received will be treated as non-COPTPA compliance unless otherwise mentioned explicitly by the IHL. An accredited programme by the ETAC is the prerequisite to register with the BEM.

6.1 The Accreditation Process

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

The ETAC's accreditation process will focus on outcomes and the IHL developed internal systems, which ensure that the graduates are adequately prepared to enter the engineering technologist 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 modes and at different locations, such as fulltime, franchised, twinning, part-time, distance learning, joint programme, multi campus etc. For each of the programmes, 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 an application 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 ETAC through MQA. Any other applications such as Continuing Accreditation should be directed to ETAC. Appendix F shows the Process Flow Chart for Application of Accreditation and Provisional Accreditation of Engineering Technology Programmes.

The accreditation visit shall be deferred if the submitted documents are of unacceptable quality, or do not follow the required format of Section 9.0 of the Standard. In such a case, the IHL shall resubmit the application.

If the documents submitted are found to be inadequate, 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 further information is not submitted within a period of three (3) months upon request.

6.5 Accreditation Evaluation

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

6.6 Accreditation Decision

Upon completion of the programme accreditation exercise, the ETAC, based on the recommendation of the Evaluation Panel, may decide on one (1) of the following complies with conditions 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 ETAC. 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 ETAC for continuing accreditation.

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

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

6.8 The Provisional Accreditation to Conduct a New 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 ETAC through MQA for programme evaluation. The recommendation from ETAC shall be forwarded to the relevant authorities. The evaluation exercise shall be conducted by ETAC.

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

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

6.10 Appeal Procedures

An IHL may appeal against a decision **TO DECLINE ACCREDITATION** made by ETAC. 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 members shall be determined by the Board of Engineers Malaysia (BEM). The number of members including the Chairman shall not be less than three (3), including a representative of the MQA.

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 ETAC, 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 ETAC.

7.0 Accreditation Procedures

This section describes ETAC'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 ETAC as per the requirements of Section 8 of this Standard. Appendix F shows the Process Flow Chart for Application of Accreditation and Provisional Accreditation of Engineering Technology 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 ETAC. 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 by ETAC and normally consists of:

- A Chairperson; and
- One (1) or two (2) members

All members are typically chosen for their broad experience in engineering/engineering technology education and their ability to evaluate the programme outcomes and quality systems. The Evaluation Panel should include at least one (1) member with extensive academic experience, and one (1) member with extensive industry experience. All members will normally be chosen from fields related to the programme being evaluated.

Members of the Evaluation Panel are selected on the basis of their expertise and standing in a particular discipline of engineering or engineering technology. 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 ETAC 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 technologist.

The Evaluation Panel needs to be aware of ETAC 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, as well as 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 technology programme shall be assessed by ETAC to enable graduates of the programme to register as engineering technologists with the BEM. The assessment involves a review of qualifying requirements for 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 - Teaching 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 technology programme must have the eight (8) components of the qualifying requirements. These components are:

i. **Minimum 140 Student Learning Time (SLT) credits. At least 100 SLT credits shall be engineering or engineering technology courses, of which a minimum 50 SLT credits shall be allocated for practice-oriented components in the technical and specialist area.**

ii. **Final Year Project (FYP) (8-12 SLT credits)**

iii. **Industrial Training (minimum of 24 weeks)**

iv. **Full-time Teaching Staff (minimum of 8)**

v. **Teaching Staff: Student ratio 1: 20 or better**

vi. **External Examiner/Advisor report (and availability of the process that requires a minimum of one (1) report over two (2) years)**

vii. **Programme Educational Objectives (PEO)**

viii. **Programme Outcomes (PO)**

Note:

- *For Provisional Accreditation application items iv, v and vi 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 technology 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 technology programme.

An Engineering Technology programme for accreditation must fulfil the following:

i. **Programme Outcomes (PO):** The IHL/faculty shall have published PO that have been formulated considering items i. to xi. given in Section 5.0 above, 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. **Continual Improvement:** The programme must also regularly use appropriate, documented processes for assessing and evaluating the extent to which the PO are being attained. The results of these evaluations must be systematically utilized as input for the continuous improvement of the program. Other available information may also be used to assist in the continuous improvement of the programme.

iii. **Stakeholders' Involvement:** The IHL/faculty shall provide evidence of stakeholder involvement with regard to Programme Outcomes (PO) and Continual Improvement 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 provides essential elements and features, which combined together will render a programme acceptable for accreditation by the ETAC.

The course structure and sequence of content shall be appropriate. Adequate time shall be allocated for each component of the content/course, including for elective courses.

Evidence shall be present to show that the contents are being updated to keep up with the scientific, technological and knowledge development in the field, and to meet the needs of society. For example, in order to address the demands of Industrial Revolution 4.0, the curriculum shall equip students with the knowledge and skills in the relevant areas to enable them to function meaningfully in their role in Industry 4.0. 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 cognitive and practical skills, as well as positive attitudes as required in the PO. The teaching and learning processes shall be reviewed from time-to-time to embrace contemporary industrial advancements.

The teaching-learning methods shall enable students to take full responsibility for their own learning and prepare them for life-long learning.

The academic programme component must consist of a normally four (4)-year duration of full-time-equivalent study with a minimum total of **140 SLT credits** (not including units for remedial courses) made up as follows:

i. A **minimum of 100 SLT credits** shall be **engineering or engineering technology courses** consisting of engineering sciences, discipline core courses, design/projects, and industrial training 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 discipline, rather than detailed memorisation of facts. The curriculum shall also provide students with ample opportunities for analytical, critical, constructive, creative thinking, and evidence-based decision making. The curriculum shall include sufficient elements for training students in rational thinking and research methods.

The curriculum content should cover the following:

i. Applied mathematics, applied science, applied engineering principles, skills and tools (computing, experimentation) appropriate to the discipline of study;
ii. Fundamental and applied Engineering knowledge;
iii. Integrated training in professional engineering practice, including safety, sustainability, management and professional ethics;
iv. Laboratory work to complement the science, computing and engineering theory;
v. Industrial training – training in engineering technology in a professional engineering-practice environment;
vi. Industrial revolution-related skills, (Examples: Artificial Intelligence, Internet of Things, Big Data Analytics, Augmented and Virtual Realities, etc);
vii. Exposure to engineering practice;
viii. Relevant tutorial classes to complement the lectures;
ix. Design Project; and
x. Final Year Project (FYP).

8.3.1 Student Learning Time (SLT) Credit

The SLT credit used is based on the Student Learning Time (SLT) as defined in the Malaysian Qualifications Framework (MQF). The SLT defines that for every one (1) credit hour 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 work, problem-based learning, e-learning modules, discovery learning, coursework projects, independent study, assessment and other relevant activities accordingly.

For Industrial Training, the requirements for industrial training 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 24 weeks and a maximum of one (1) year.

8.3.2 SLT credit calculation for conventional Industrial Training (Please refer to 8.3.6)

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)

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:

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

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

- FYP and design projects are encouraged to be implemented as WBL courses incorporated inside the industry placement period/s.
- The SLT credits may be accumulated in more than one (1) industry placement period.
- A FYP is subjected to a minimum of eight (8) SLT credits and a maximum of twelve (12) SLT credits.

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 Practical Learning

Practical learning is part of practice-oriented component. Students should be able to practise engineering skills to complement engineering theory that is learnt through lectures. It should engage students with the use of facilities, equipment and instrumentation reflective of current industry practice which will help in developing competency in executing applied and experimental work. Students should work in groups, preferably not more than five (5) in a group.

Throughout the programme, there should be adequate provision for laboratory or similar investigative work, which will develop the confidence in the students to deal with broadly-defined 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 supports the attainment of the learning outcomes. 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 (A) all of which contribute to ELT and credits calculation.

8.3.7 Exposure to Engineering Practice

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

i. lectures/talks by guest lecturers from industry;
ii. teaching staff with industrial experience;
iii. courses on professional ethics and conduct;
iv. industry visits and/or industry exhibition;
v. an industry-based final year project and/or industry related competition;
vi. regular use of a logbook in which industrial experiences are recorded;
vii. industry research for feasibility studies;
viii. study of industry policies, processes, practices and benchmarks;
ix. interviewing engineering and engineering technology practitioners;
x. industry based investigatory assignments;
xi. direct industry input and advice to problem solving and projects assessment; and/or
xii. industrial case studies.

It is considered that there is no real substitute for first-hand experience in an engineering-practice environment, outside the IHL. The ETAC advocates that all engineering-based teaching staff acquire some exposure to such experience, in addition to the other elements suggested, and make efforts to assist all students gain placements of suitable quality.

8.3.8 Industrial Training

The conventional industrial training shall be adequately structured, supervised and evaluated to acquire appropriate competencies.

Training in engineering practice will provide first-hand experience in an engineering-practice environment, outside the IHL. Familiarity with all common engineering technology processes is essential and training 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 appropriate hands-on skills. Latest processes and large scale or costly operations can only be the subject of observation or demonstrated, and visits to engineering works may be helpful in such cases.

Industrial training is a key component of learning in an integrated academic curriculum. IHL shall put a strenuous effort to assist all students to gain placements of suitable quality.

8.3.9 Final Year Project (FYP)

The Final Year Project (FYP), consisting of either industry-based or practice-oriented projects, can provide one (1) of the best means of introducing a real professional approach to engineering studies and practices. For this reason, the use of projects as a vehicle for teaching and for integration of core areas is strongly encouraged throughout the programme.

It is a requirement of the programme to include a significant project in its later stages. The FYP is required to seek individual analysis and judgement, capable of being assessed independently from the work of others. The student is expected to develop techniques in literature review and information processing.

It is recommended that FYP should also provide opportunities to utilise appropriate modern technology in some aspect of the work, emphasising the need for engineers to make use of computers and multimedia technology.

8.3.10 Design Project

Design projects shall include broadly-defined applied engineering problems and design systems, components or processes integrating core areas and meeting specified needs with appropriate consideration for public health and safety, cultural, societal, and sustainability considerations.

8.4 Criterion 4: Students

Students intending to pursue engineering technology programmes shall have a good understanding of mathematics and natural sciences. The normal entry qualification may include:

i. Sijil Tinggi Persekolahan Malaysia (STPM) with CGPA 2.0 or equivalent, and a minimum Grade C in Mathematics and one (1) relevant science or technical based subject

OR

ii. Diploma in Engineering or Engineering Technology or equivalent

OR

iii. Diploma Kemahiran Malaysia (DKM) in related fields or equivalent

OR

iv. Diploma Vokasional Malaysia (DVM) in related fields or equivalent

OR

v. APEL.A as prescribed by MQA based on appropriate justifications by the IHL

IHL shall ensure that prospective students, who do not meet the above criteria, undertake suitable remedial programmes in order to attain the equivalent entry qualification.

A programme shall have clear policies on credit transfer. IHLs must put in place the mechanism for credit transfer or exemptions to allow alternative educational pathways.

A maximum of 50% of the total credits is allowed for lateral (horizontal) credit transfer from a similar level accredited programme. A maximum 30% of total SLT credits is allowed for vertical credit transfer from diploma level to degree level. If the IHL, or IHL in formal collaboration, have designed both programme curricula together to ensure continuity, coherence and completeness, the maximum transfer allowed is 50%. Credit transfer as described above may include APEL.C (not exceeding 30%) components as prescribed by MQA based on appropriate justifications by the IHL. 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.

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

8.5 Criterion 5: Teaching and Support Staff (to cater for all, inclusive WBL)

It must be demonstrated that the teaching staff have the competencies to cover all areas of the programme, and are fully aware of the outcome-based approach to education. In addition, teaching staff shall be sufficient in number and capability among others to accommodate student-staff interaction, advising and counselling, service activities, professional development, and interaction with practitioners and employers. This is to ensure the quality of the engineering technology programme and the attainment of its stated outcomes. Engineering/engineering technology programmes must have a minimum of eight (8) full-time teaching staff in the relevant engineering disciplines. All eligible teaching staff are registered with the BEM.

Teaching staff shall have postgraduate degrees (Masters level or higher). However, a staff member with first degree and five (5)-year industrial/specialist experience with acceptable professional qualifications may be considered. 30% of the teaching staff must have a professional/industrial/specialist certification or at least two (2) years of relevant industrial work experience. If this is not met, the institution should have a staff industrial attachment scheme in place.

The overall competence of the teaching staff may be judged by such factors as education, diversity of background, industrial experience, teaching experience, ability to communicate, enthusiasm for developing more effective programmes, level of scholarship, and participation in professional societies. The IHL should provide the opportunity to its staff to gain the necessary industrial experience.

The Full-Time Equivalent (FTE) teaching staff to student ratio shall ideally not exceed 1:20 to ensure effective delivery, student-staff interaction, student advising and counselling, IHL service and industry 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 shall be in charge of not more than two (2) laboratories.

Sharing teaching staff between programmes is allowed, and will count for teaching staff to student ratio based on FTE guidelines.

Part-time staff from industry is encouraged, and will count towards teaching 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.

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

For programmes offered at multiple or remote locations, facilities must be sufficient to support student learning, substantially 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 that 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 technology programmes and 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 technology 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 creative leadership is available to the IHL through the appointment of highly qualified and experienced senior staff in sufficient numbers.

The development of teaching 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 also 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 technology programme. The IHL must have sufficient financial resources to acquire, maintain, and operate facilities and equipment appropriate for the engineering technology 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 teaching staff. The processes include reviewing PEO, PO and Course Outcomes (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 full 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. The IHL awarding the degree shall be responsible for ensuring the quality 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 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 or engineering technologists, and employers of engineers or engineering technologists 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 the 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/FYP 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 ETAC through MQA. It should not be necessary to develop extensive documentation specifically for accreditation evaluation, since the purpose of accreditation is to evaluate the systems already in place.

For each application, IHL shall also submit unless otherwise stated, 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. Describe 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. Discuss 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 or achievement of the PO.

ii. Discuss the programme delivery and assessment methods and how these are appropriate to, consistent with, and support the development of the range of intellectual and practical skills and attainment or achievement 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 the contribution of each course to the PO.
- Distribution of the engineering technology courses (including industrial training and WBL courses) and general education courses throughout semesters such as finance, management and Mata Pelajaran Umum (MPU) courses.
- Mapping of the courses to the Knowledge and Attitude Profile as in Appendix B.
- Distribution of the courses offered according to semester.

Note: *Samples of table formats are available in Appendix G.*

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

v. Discuss how the requirements of Broadly-defined Problem Solving and Broadly-defined Engineering Activities have been addressed.

vi. Discuss laboratory exercises, including delivery approach and assessment scheme; and how these are mapped to PO.

vii. Discuss Industrial Training scheme and how it is mapped to PO.

9.2.5 Students

i. Discuss the requirement and process for admission of students into the programme.

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

iii. Discuss the counselling services available.

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

v. Discuss students' workload.

vi. Discuss students' activities and involvement in student organisations that providing experience in social, management and related matters.

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

- The distribution of students' enrolment for the past four (4) academic years (Table 4 in Appendix G).
- The entry qualifications of final year students considered for accreditation (Table 5 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. Discuss CQI strategies to be implemented in relation to student performance.

9.2.6 Teaching and Support Staff

i. Discuss the strength and competencies of the teaching staff/ WBL industry mentor in covering all areas of the programme, including implementation the outcome-based approach to education.

ii. Discuss how the overall teaching staff workload enables effective teaching, student-staff interaction, student advisory 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 is not limited to the following:

- A breakdown in terms of numbers of teaching staff (full-time, part-time and inter-programme) by year for the past four (4) years (Table 6 in Appendix G).
- An analysis of all teaching staff (Table 7 in Appendix G).
- A summary of the academic qualifications of teaching staff (Table 8 in Appendix G).
- A summary of the professional/industrial/specialist certifications and membership in professional bodies/societies of teaching staff (Table 9 in Appendix G).
- A summary of the posts held by full time teaching staff (Table 10 in Appendix G).
- A summary of teaching workload of teaching staff for the current semester (Table 11 in Appendix G).
- An analysis of all support staff (Table 12 in Appendix G).

- A summary of the posts held by support staff (Table 13 in Appendix G).
- The teaching staff: student ratio by year for all academic years for the past four (4) years (Table 14 in Appendix G).
- A listing of lecturers/invited speakers from industry/public bodies and their level of involvement.

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

vi. Discuss participation of teaching staff in consultancy activities.

vii. Discuss participation of teaching staff in development activities.

viii. Discuss CQI strategies to be implemented in relation to teaching 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 multi-delivery modes.

ii. For programmes offered wholly or 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. to 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 of relevant to the programme).
- recreational facilities.
- information on recent improvements and planned improvements in these facilities.

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

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

viii. Discuss 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 carried out.

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 ETAC (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 teaching or support staff, number of teching staff with professional qualifications, staff student ratio, facilities and 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 Technology Programme

10.1 ETAC Initial Evaluation

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

i. Application for Provisional Accreditation to Conduct a New Engineering Technology 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 ETAC.

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

ETAC shall appoint an Evaluator to evaluate the proposed programme.

The evaluation shall cover among others the following areas:

- general awareness of current development in engineering technician education and engineering practice;
- the stated PEO and PO;
- the programme structure and course content;
- the quality of staff*;
- the teaching and student facilities;
- the library/resource centre;
- the IHL's quality systems and processes;
- the assessment procedure and examination rules;
- for WBL type programme (>20% total credit), proof of cooperation/collaboration/commitment must be provided; and
- other related activities.

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

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

10.2 Report and Recommendation

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

10.3 ETAC Decision

Based on the evaluation, ETAC 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 ETAC.

iii. Not to recommend approval.

The recommendation from ETAC 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 a 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 Technician Education Programme Accreditation Standard 2020
https://drive.google.com/file/d/16A1Z6Uvux4r3J_zwbWUSS3KVHesdIDgw/view

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

iv. EQAVET - European Quality Assurance in Vocational Education and Training
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List of Appendices

Appendix A

ENGINEERING TECHNOLOGY ACCREDITATION COUNCIL

1.0 ENGINEERING TECHNOLOGY ACCREDITATION COUNCIL

1.1 The Engineering Technology Accreditation Council (ETAC) is an independent body for accreditation of engineering technology and technician programmes delegated by the BEM. The policy on programme accreditation determined by the ETAC and is subject to revision. Implementation of the policy is the responsibility of the ETAC.

1.2 Members of the ETAC shall be appointed by the BEM as follows:

a. A Chairman (nominated by the BEM)
b. A Deputy Chairman (nominated by the BEM from the IHL producing Engineering Technologists and Engineering Technicians or any related body)
c. One (1) MQA representative
d. 18 members representing the branches of engineering technology from constituent organisations.

    i. Five (5) members nominated by the BEM, of which minimum two (2) from the IHL producing Engineering Technologists and/or Engineering Technicians
    ii. Five (5) members from relevant learned societies
    iii. Four (4) Members from related Ministries or government agencies
    iv. Four (4) members from the industry employers of Engineering Technologists and Engineering Technicians in Malaysia

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

1.3 The ETAC shall comprise persons from academia and industry, with a minimum of 50% from industry. In appointing the members of the ETAC, the BEM shall maintain a reasonable spread of expertise across various branches of engineering/engineering technology disciplines.

1.4 The final decision on the membership of the ETAC is with the BEM.

1.5 The terms of reference for the ETAC 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 programmes, and decide on award of accreditation. Establish and maintain a list of accredited engineering technology and engineering technician programmes.
v. Respond to any complaints or appeals on accreditation.
vi. Oversee the development and operation of accreditation and mutual recognition of programmes with other countries.
vii. Inform the Board of the activities of the ETAC and where necessary make recommendations to the Board.
viii. Foster the dissemination of developments and best practices in engineering technology and engineering technician education.
ix. Advice the Board on public statements or representations that should be made in relation to engineering technology and engineering technician education.
x. Hold consultation meetings with IHLs as and when necessary.
xi. Hold meetings at least six (6) times per year.
xii. Propose additional ETAC members if necessary.

2.0 EVALUATION FOR PROVISIONAL ACCREDITATION TO CONDUCT A NEW PROGRAMME

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

Appendix B

1.0 Common Range and Contextual Definitions

1.1 Range of Problem Identification and Solving

The range of broadly-defined engineering problem as required by the Programme Outcomes in Section 5.0 is defined as follows:

No.	Attribute	In the context of both Graduate Attributes and Professional Competences: Broadly-defined Engineering Problems have Characteristics of SP1 and some or all of SP2 to SP7:
SP1	Depth of Knowledge Required	Cannot be resolved without engineering knowledge at the level of one or more of SK 4, SK5, and SK6 supported by SK3 with a strong emphasis on the application of developed technology
SP2	Range of conflicting requirements	Involve a variety of constraints technical and non-technical issues (such as ethical, sustainability, legal, political, economic, societal) and consideration of future requirements
SP3	Depth of analysis required	Can be solved by application of well-proven analysis techniques and models
SP4	Familiarity of issues	Belong to families of familiar problems which are solved in well-accepted ways
SP5	Extent of applicable codes	Address problems that may be partially outside those encompassed by standards or codes of practice
SP6	Extent of stakeholder involvement and level of conflicting requirements	Involve different engineering disciplines and other fields with several groups of stakeholders with differing and occasionally conflicting needs
SP7	Interdependence	Address components of, or systems within complex engineering problems

1.2 Range of Engineering Activities

The range of **broadly-defined engineering activities** is defined as follows:

No.	Attribute	Well-defined activities
	Preamble	Broadly-defined activities means (engineering) activities or projects that have **some or all** of the following characteristics:
TA1	Range of resources	Involve a variety of resources including people, data and money, information, natural, financial and physical resources and appropriate technologies including analytical and/or design software
TA2	Level of interactions	Require the best possible resolution of occasional interactions between technical, non-technical and engineering and other issues, of which few are conflicting
TA3	Innovation	Involve the use of new materials, techniques or processes in non-standard ways
TA4	Consequences to society and the environment	Have reasonably predictable consequences that are most important locally, but may extend more widely
TA5	Familiarity	Require a knowledge of normal operating procedures and processes

1.3 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
SK1	A systematic, theory-based understanding of the **natural sciences** applicable to the sub-discipline and awareness of relevant social sciences
SK2	Conceptually-based **mathematics**, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed consideration and use of models applicable to the sub-discipline
SK3	A systematic, theory-based formulation of **engineering fundamentals** required in an accepted sub-discipline
SK4	Engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for an accepted sub-discipline
SK5	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** using the technologies of a practice area
SK6	Knowledge of **engineering technologies** applicable in the sub-discipline
SK7	**Knowledge of** the role of technology in society and identified issues in applying engineering technology such as public safety and sustainable development[2]
SK8	Engagement with the current **technological literature** of the discipline and awareness of the power of critical thinking
SK9	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 attitude and develops the base attributes listed below is typically achieved in four (4) years of study.*

2. *Represented by the 17 UN Sustainable Development Goals (UN-SDG).*

Appendix C

ENGINEERING TECHNOLOGY ACCREDITATION COUNCIL

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

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	Minimum 140 SLT credits of which 100 SLT credits must be engineering technology courses of which a minimum 50 SLT credits shall be allocated for practice-oriented components in the technical and specialist area.		
2	Final Year Project (FYP) (8 – 12 SLT credits)		
3	Industrial Training / WBL (minimum of 24 weeks)		
4	Full-time Teaching Staff (minimum of 8)		
5	Teaching Staff: Student ratio of 1: 20 or better		
6	External Examiner/Advisor report (and availability of the process that requires a minimum of one (1) report over two (2) years)		
7	Programme Educational Objectives (PEO)		
8	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 ETAC can be made by the IHL. IHLs are advised to ensure all requirements are fulfilled by the programme before reapplying for accreditation.

1. *For Provisional Accreditation, please fill out this Appendix wherever applicable. For new programme, a commitment to the minimum of 8 full-time teaching staff and teaching 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	ETAC Reference Number		
7	Diploma 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 WEPS, WEA and Knowledge and Attitude Profile.		
E6	List of titles of experiments in the laboratory and documented evidences.		
E7	List of industrial training companies.		
E8	List of exposure to engineering practice activities and sample students' reports.		
E9	List of final year project titles and learning outcomes and Course to Programme Outcomes matrix.		
E10	Design project's synopsis and learning outcomes and Course to Programme Outcomes matrix.		
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 TECHNOLOGY 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	Minimum 140 SLT credits of which 100 SLT credits must be engineering or engineering technology courses of which a minimum 50 SLT credits shall be allocated for practice-oriented components in the technical and specialist area		
2	Final Year Project (FYP) (8-12 SLT credits)		
3	Industrial Training / WBL (minimum of 24 weeks)		
4	Full-time Teaching Staff (minimum of 8)		
5	Teaching Staff: Student ratio of 1: 20 or better		
6	External Examiner/Advisor report (and availability of the process that requires a minimum of one (1) report over two (2) years)		
7	Programme Educational Objectives (PEO)		
8	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 SLT Credits

a. Total number of SLT credits

b. Number of SLT credits for engineering or engineering technology courses

c. Number of SLT credits for other related general education courses

3.2 The Curriculum

a. Programme Structure, Course Contents, and Balanced Curriculum

Observation

b. Programme Delivery and Assessment Methods

Observation
Delivery: Assessment:

c. Practice-oriented components

Observation

d. Final Year Project / Final Project

Observation

e. Design Project

Observation

f. Industrial Training / WBL

Observation

g. Exposure to 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 followed the criteria set in the standard with adequate 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 Programme

Programme has implemented policies on credit transfer/credit exemptions.	**YES** ☐ **NO** ☐ Remarks:

4.2 Students Development

	YEAR 1	YEAR 2	YEAR 3
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:

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: TEACHING AND SUPPORT STAFF

5.1 Teaching Staff

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

a. Number and competency of Teaching Staff / WBL Industry Mentor

Total number of teaching staff teaching the programme	
All eligible teaching staff are registered with BEM	**YES** ☐ **NO** ☐ Remarks:
Teaching staff is sufficient in number and competencies to cover all curricular areas.	**YES** ☐ **NO** ☐ Remarks:
Teaching staff have the education, diversity of background, engineering experience, teaching experience.	**YES** ☐ **NO** ☐ Remarks:
Teaching staff have the ability to communicate, enthusiasm for developing more effective programmes, level of scholarship.	**YES** ☐ **NO** ☐ Remarks:
Teaching staff participate in professional societies or as 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 teaching staff with Bachelors qualification.	
Total number of teaching staff with MSc and PhD qualifications.	

c. Industrial involvement

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

d. Teaching load/contact hours

Normal teaching hours per week is less than 18	**YES**		**NO**	Remarks:

e. Motivation and enthusiasm

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

f. Use of lecturers from the industry

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

g. Awareness of the Outcome-based approach to education

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

5.2 Support Staff (Technical and Administration)

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

a. Qualification and experience

Technical staff are qualified.	**YES** ☐ **NO** ☐ Remarks:
Total number of technical staff.	
Total number of administrative staff.	

b. Adequacy of support staff

Technical staff adequacy is satisfactory (ideally one (1) technical staff to two (2) laboratories).	**YES**	**NO**
	Remarks:	
Administrative staff adequacy is satisfactory to support programme's operation.	**YES**	**NO**
	Remarks:	

5.3 Teaching Staff: Student Ratio

a. Teaching 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 practice 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, 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, FYP 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. Other 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 teaching 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 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:			

d. Staff development

Academic staff development: The IHL has systematically plan and provide appropriate sponsorship for postgraduate studies/ sabbatical leave, training towards professional 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:			

e. 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:	

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 IHL and properly implemented including benchmarking and CQI.	**YES**	**NO**
	Remarks:	

7.3 External Assessments

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

External Examiner/Advisor report a minimum of one (1) report over two (2) years CQI initiated, if necessary, from the report.	**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. CQI initiated, if necessary, from the minutes. IAP participation in academic activities	**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. There are activities to inculcate safety practice among staff and student.	**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 TECHNOLOGY ACCREDITATION COUNCIL

Date Received by the ETAC:

Comments by the ETAC:

Recommendation by ETAC

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

If not agreeable with Evaluation Panel's recommendation, ETAC 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 report should may comment and give suggestions for further improvement consider assessing on the following in the report:

The External Examiner/Advisor shall contain but is not limited to the following:

i. Assessment of the Programme Educational Objectives and Programme outcomes.

ii. Assessment of programme curriculum in relation to:
- objectives and outcomes.
- course structure and sequence of content.
- practice-oriented components.
- teaching-learning methods and delivery modes.
- student workload

iii. Assessment of teaching and support staff quality including qualifications and industry exposure (both in institution and industry). This is to include assessment of loading of each staff in teaching, research, consultancy and supervision of student projects.

iv. Assessment of Teaching Staff (both in institution and industry) to student ratio. If found to be not sufficient, corrective action to be taken by the IHL.

v. Assessment of preparation process of examination papers i.e. procedures for setting and vetting, quality assurance, confidentiality and security.

vi. Assessment of examination papers and marking schemes set for the standard of questions, coverage of syllabus, adequate balance between theory and application, setting of questions based on educational taxonomy, adequate choice of questions, and appropriateness of marking scheme.

vii. Assessment of the marked answer scripts based on a sample of good, average and weak candidates. Fairness/disparity of marking, follow-through method adopted if answer to one (1) section is wrong, response of candidates to the question, and distribution of marks.

viii. Assessment of coursework, laboratory work, assignments, design projects, final projects.

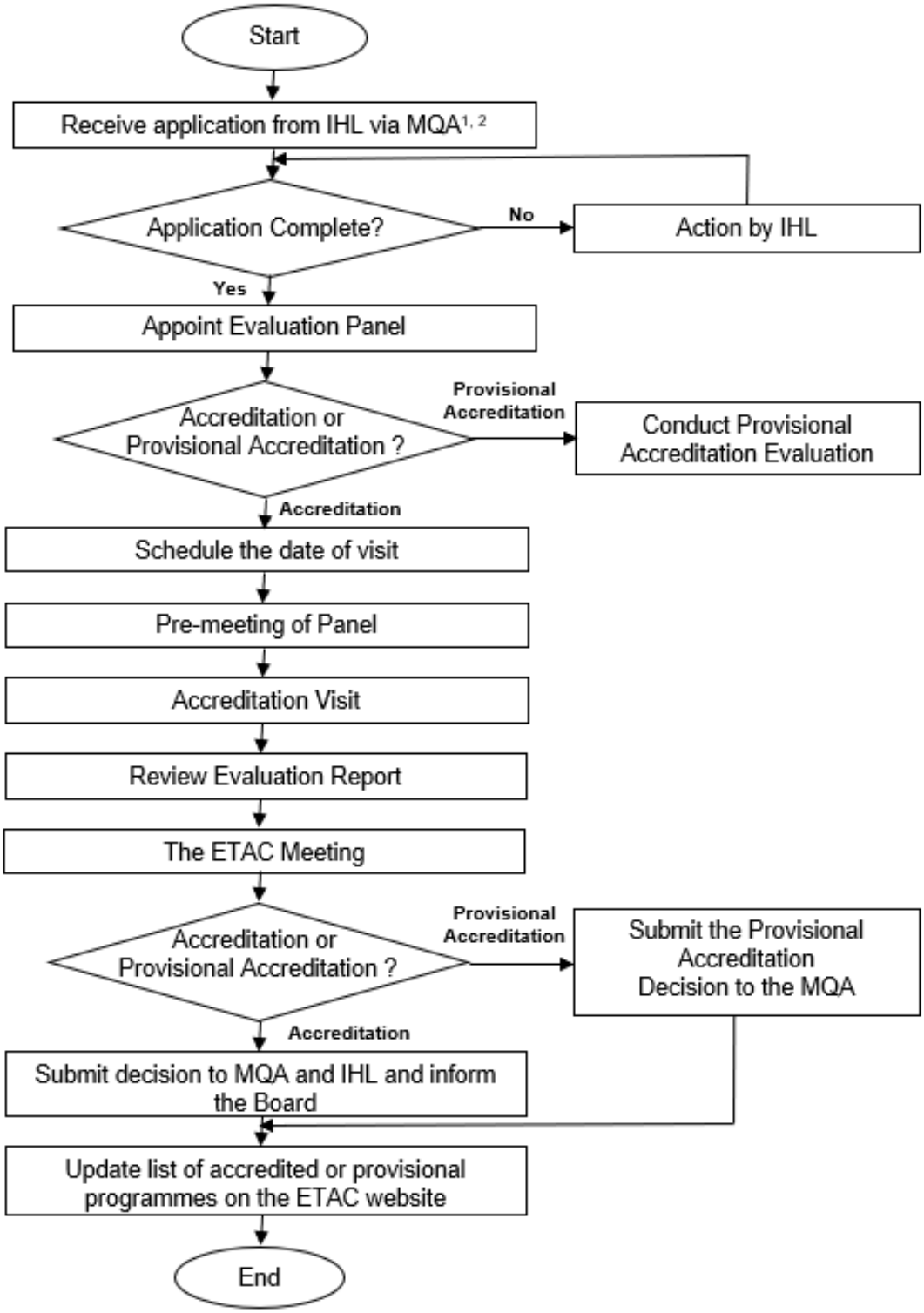
ix. Assessment of the major facilities of the programmes

x. Assessment of examination procedures and regulations.

xi. Management commitment towards the programme.

Appendix F

PROCESS FLOW CHART FOR APPLICATION OF ACCREDITATION AND PROVISIONAL ACCREDITATION OF ENGINEERING TECHNOLOGY 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 technology programme is to be submitted before offering the engineering technology programme.*

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

Appendix G

SAMPLE TABLE TEMPLATES FOR SELF-ASSESSMENT REPORT (SAR)

TABLE 1: Course to PO Matrix (SAMPLE)

Code:	Course:	Link to the PO										
		1	2	3	4	5	6	7	8	9	10	11
ENGXXA	Course 1	X			X						X	
ENGXXB	Course 2		X	X	X							
ENGXXC	Course 3	X			X		X					
ENGXXD	Course 4	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 Technology 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: Courses Offered (Programme Structure) According to Semester and Total Credit Hours (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 4: 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 5: Entry Qualification of Final Year Students of the Current Year

Entry	Number
STPM	
Matriculation	
Diploma	
Others (credit transfer, etc)	

TABLE 6: Breakdown in Terms of Numbers of Teaching Staff (Fulltime, Part-Time and Interprogramme) by Year for all Academic Years for the Past Four (4) Years

TEACHING STAFF	SESSION			
	202a	202b	202c	202d
(a) Total number of full-time teaching staff (including those servicing other programme, staff on study or sabbatical leave & tutors)				
(b) Full-time equivalent of teaching staff servicing other programme				
(c) Teaching staff (on study or sabbatical leave)				
(d) Tutors				
(e) Effective full-time teaching staff = (a)-(b)-(c)-(d)				
(f) Full-time equivalent of teaching staff from other programme servicing this programme				
(g) Full-time equivalent of part time teaching staff / industry mentor				
Full-Time Equivalent Teaching Staff Contributing to Staff: Student Ratio = (e)+(f)+(g)				

Notes:

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

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

- *One (1) Full-Time Equivalent Teaching Staff Member should normally have 15 contact hours (lecture/tutorial/lab supervision/student consultation) per week.*

Table 7: Analysis of all Teaching 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 8: Academic Qualifications of Teaching staff

Academic Qualifications	Number
Doctorate	
Masters	
Bachelor	
Diploma	
TOTAL	

TABLE 9: Professional/Industrial/Specialist Certifications and Membership

Type of Qualification/Field	Total Number of Staff	Registration/ Certification number
PEng		
CEng		
CPEng		
FMSET		
MSET		
FIEM		
MIEM		
Graduate Engineer IEM		
Graduate Engineer BEM		
IEAust		
Others		

TABLE 10: Post Held by Teaching Staff

Post	Number	
	Full Time	Part Time
Professor		
Assoc. Professor		
Sr. Lecturer		
Lecturer		
Tutors		
TOTAL		

TABLE 11: Teaching Staff Teaching Workload Summary for the Current Semester

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

TABLE 12: 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 13: Post Held by Support Staff

Post	Number
TOTAL	

Table 14: Teaching 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 ETAC, regarding 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.

2. PREPARATION FOR ACCREDITATION VISIT

2.1 The Evaluation Panel needs to be aware of the ETAC 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 ETAC in the prescribed format.

2.3 The Evaluation Panel will assess the accreditation Criteria 1 to 7 criteria based on all the 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 diploma programme meets the academic requirements of the ETAC.

2.5 The Head of Panel (HoP) and 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 the additional information from the IHL. When the information is received, it should be forwarded to the Head of Panel (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 e-mail (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 ETAC.

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 Evaluation Panel Chair 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 Evaluation Panel chair and Evaluation Panel members should discuss the ETAC evaluation criteria and how they apply to the programme being evaluated.

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

i. Programme educational objectives and specifications of graduate outcomes
ii. Whether the development, review and attainment monitoring of graduate outcomes are informed by industry stakeholders
iii. Whether the outcome specification drives a top-down educational design process
iv. Whether the academic curricular reflects a professional engineering technician education programme, and whether it satisfies the criteria completely
v. Whether the learning outcomes and assessment measures within courses systematically track delivery of the targeted graduate outcomes
vi. Whether the mathematics and science courses are at appropriate levels

vii. Whether the content of each course is appropriate
viii. Whether the level of course materials is appropriate
ix. Whether the courses are built on previous course work
x. Whether the teaching-learning process includes appropriate assessment
xi. Whether the practice-oriented components are appropriate
xii. Whether the industrial training/WBL courses and project work are at a sufficient level
xiii. Students' standing in terms of their admission standards, academic performance, and industrial training/WBL
xiv. The teaching/WBL industry mentor and support staff in terms of their credentials and qualifications, range of competencies, advanced degrees, industrial experience, teaching loads, and their involvement and accountability as an Evaluation Panel member for educational design, review and improvement, etc.
xv. Whether 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. Whether the quality management system is adequate for the programme
xvii. Whether the external assessment is appropriate, consistent and fair
xviii. Whether the quality loop is properly closed 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 typical 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 ETAC 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, teaching 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, teaching 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 technology laboratories and associated facilities
10:00 – 11:30	Evaluation Panel Meeting with teaching/technical/administrative staff (additional meeting with teaching 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 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).

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

4.4 The Evaluation panel report (Appendix D) shall:

i. State whether the programme meets ETAC requirements.
ii. Where appropriate, provide constructive feedback (weaknesses and concerns) and note positive elements (strengths). 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, or deferred.
iv. Make clear and unequivocal recommendations to ETAC.

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

4.6 Declined accreditation, would be recommended for the programme if there are any major shortcomings and (non-compliances) for any of the criterion. 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. Minimum 140 Student Learning Time (SLT) credits. At least 100 SLT credits shall be engineering or engineering technology courses, of which a minimum 50 SLT credits shall be allocated for practice-oriented components in the technical and specialist area.
ii. Final Year Project (FYP) (8-12 SLT credit units)
iii. Industrial Training/WBL (minimum of 24 weeks)
iv. Full-time Teaching Staff (minimum of 8)
v. Teaching Staff: Student ratio 1: 20 or better
vi. External Examiner/Advisor report (and availability of the process that requires a minimum of one (1) report over two (2) years)
vii. Programme Educational Objectives (PEO)
viii. 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 technology 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.

The following are examples of performance indicators expected for Programme Objectives:

Statements are well defined, measurable and achievable
Statements are well published and publicised
Clear linkage between Programme Educational Objectives (PEO) and Programme Outcomes (PO)
Important stakeholders provide inputs in the process
A documented and effective process, involving programme stakeholders, for the periodic review and revision

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>
The quality and performance of students, in relation to the PO is of utmost importance in the evaluation of an engineering technology programme.
The IHL/faculty shall have published PO that have been formulated considering items (i) to (xi) 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.
The following are examples of performance indicators expected for Programme Objectives:

Statements are well defined, measurable and achievable
Statements are well published and publicised
A documented process for assessing and evaluating the extent to which the Programme Outcomes are being attained has been established
Results of these evaluations must be systematically utilized as input for the continuous improvement of the program
Important stakeholders provide inputs in the process

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
Continual Improvement</td><td>
The programme must also regularly use appropriate, documented processes for assessing and evaluating the extent to which the PO are being attained. The results of these evaluations must be systematically utilized as input for the continuous improvement of the program. Other available information may also be used to assist in the continuous improvement of the programme.
The following are examples of performance indicators expected for Continual Improvement:

A documented process for assessing and evaluating the extent to which the Programme Outcomes are being attained has been established
Results of these evaluations must be systematically utilized as input for the continuous improvement of the program

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/faculty shall provide evidence of stakeholder involvement.

The following are examples of performance indicators expected for Stakeholders' 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**
Total number of SLT credits	The academic programme component must consist of a normally four (4)-year duration of full-time-equivalent study with a minimum total of 140 SLT credits (not including units for remedial courses)
Number of SLT credit units for engineering technology subjects	A minimum of 100 SLT credits shall be engineering technology courses consisting of engineering sciences, discipline core courses, design/projects, and industrial training appropriate to the student's field of study.
Number of SLT credits for other related general education subjects	The remaining SLT credit units shall include sufficient content of general education component (such as mathematics, computing, languages, general studies, co curriculum, management, law, accountancy, economics, social sciences, etc.)
Programme Structure, Course Contents, and Balanced Curriculum	A balanced curriculum shall include all technical and non-technical attributes listed in the Programme Outcomes, and shall have the balance between the essential elements forming the core of the programme and additional specialist or optional studies (electives). The curriculum shall ensure a minimum 50 SLT credits shall be allocated for practice-oriented components in the technical and specialist area. The course structure and sequence of content shall be appropriate. Adequate time shall be allocated for each component of the content/course, including for elective courses. Evidence shall be present to show that the contents are being updated to keep up with the scientific, technological and knowledge development in the field, and to meet the needs of society. Electives are strongly encouraged, monitored, and appraised. The proportion of electives shall not exceed the core subjects and shall preferably offer wide options.
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 such as Work Based Learning (WBL), 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 Programme 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. Tutorials, group learning, interaction and innovative educational experience are designed to complement lectures. Tutorial and all other delivery approaches arepart and parcel of the programme so as to complement the lectures. A tutorial session should preferably not exceed 30 students at any one time.

Practice-oriented components	Students should be able to practise engineering skills to complement engineering theory that is learnt through lectures. Practice-oriented learning experiences should engage students with the use of facilities, equipment and instrumentation reflective of current industry practice which will help in developing competence in executing applied and experimental work. Students should work in groups, preferably not more than five in a group. Throughout the programme, there should be adequate provision for laboratory or similar investigative work, which will develop in the students the confidence to deal with applied engineering problems.
Final Year Project/ Design Project	It is proposed that at least nine (9) reports are to be examined by the Evaluation Panel (3 from the best group, 3 from the middle group and 3 from the poor group). The supervisors of the Projects must be teaching 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 technology in some aspect of the work, emphasising the need for engineers to make use of computers and multimedia technology in everyday practice.
Industrial Training	Training in engineering practice will provide first-hand experience in an engineering-practice environment, outside the IHL. Familiarity with all common engineering technology processes is essential and training at a practical level to a wide variety of processes is required at a level appropriate to the students. Whilst it is clearly desirable for students to be properly trained for the skills involved, the central aim is to acquire craft skills. Clearly, many of the latest processes and large scale or costly operations can only be the subject of observation or demonstration, and visits to engineering works may be helpful in many such cases. Industrial training is a key component of learning in an integrated academic curriculum. Due to its importance, the programme shall have a minimum of 24 weeks and a maximum of 1 year industrial training for each student. IHL shall put a strenuous effort to assist all students to gain placements of suitable quality.

Work-Based Learning	Work-Based Learning (WBL) is one of the educational approaches that provides students with authentic context for learning and real-life work experiences in an engineering industry environment. IHL shall work with WBL partner industry to ensure the relevance of learners' training during periods of WBL. The Evaluation Panel is to assess the WBL courses which integrate the IHL curriculum with the workplace to create a diversity of learning environment through merging theory with practice in workplace. The IHL and partner industry should agree when the quality of the WBL training will be monitored and how improvement will be made. IHL and WBL partner industry must continuously aware of the specific needs of learners throughout their WBL training. The IHL must ensure students' and partner industry are kept well informed and receive updates on all aspects of WBL training. The IHL must ensure the industry-based staff are well prepared for their WBL training role. The IHL must work with partner industry to review the WBL training programme and to assess and certify individual students' achievements, where appropriate.
Exposure to Engineering Practice	Exposure to engineering practice shall also be integrated throughout the curriculum as it is a key. In addition, exposure to professional engineering or engineering technology practice may also be obtained through activities as listed on page 20 of the Standard.

CRITERION 4 – STUDENTS	
ASPECTS	**GUIDE FOR EVALUATION**
Entry requirements (Academic)	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 engineering technologist.
Transfer Policy/Selection Procedures/Appropriateness of arrangements for Exemptions from part of the course	IHLs must put in place the mechanism for credit transfer and exemption to allow alternative educational pathways. A maximum of 50% of the total credits is allowed for lateral credit transfer from a similar level programme. A maximum 30% of total credit units is allowed for vertical credit transfer from diploma level to degree level. If the IHL, or IHLs in formal collaboration, have designed both programme curricula together to ensure continuity, coherence and completeness, the maximum transfer allowed is 50%. A programme shall have clear policies on credit transfer. Credit transfer as described above may include APEL.C components as prescribed by MQA based on appropriate justifications by the IHL.
Student Counselling	IHL shall monitor and evaluate 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.
Workload	Students shall not be over-burdened with workload that may be beyond their ability to cope with. An optimum credit units per semester shall be between 16-20 SLT credits.
Enthusiasm and Motivation	The teaching-learning environment shall be conducive to ensure that students are always enthusiastic and motivated.
Co-curricular activities	IHL shall also actively encourage student participation in co-curricular activities and student organisations that provide experience in management and governance, representation in education and related matters and social activities.
Observed attainment of Programme Outcomes by students	The Evaluation Panel is to get a first-hand feel of the students' achievement of the Programme Outcomes by interviewing and observing them at random as well as going through random samples of student's work.

CRITERION 5 – TEACHING AND SUPPORT STAFF	
ASPECTS	**GUIDE FOR EVALUATION**
A. TEACHING STAFF **Number and Competency of Teaching staff**	It must be demonstrated that the teaching staff have the competencies to cover all areas of the programme, and are fully aware of the outcome-based approach to education. In addition, teaching staff shall be sufficient in number and capability to accommodate student-staff interaction, advising and counselling, service activities, professional development, and interaction with practitioners and employers. This is to ensure the quality of the engineering technology programme and the attainment of its stated outcomes. As a guide, a viable engineering technology department would be expected to have a minimum of 8 full-time teaching staff in the particular engineering discipline.
Qualification, industrial experience & development	Teaching staff shall have postgraduate degrees (Masters level or higher). However, a staff member with good first degree and 5-year industrial/specialist experience with acceptable professional qualifications may be considered. 30% of the lecturers/instructors must have a professional/industrial/specialist certification or at least two (2) years of relevant industrial work experience. If this is not met, the institution should have a staff industrial attachment scheme in place. For industry mentors, they should have at least five (5) years in relevant related industry.
Research/publication/consultancy	Teaching 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	The Evaluation Panel is to assess whether the staff members are involved in appropriate consultancy and industrial jobs.
Teaching load/contact hours	Average teaching load (teaching hours per week): < 12 hours (good), 12 – 15 (satisfactory), >15 (Unsatisfactory).
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/Department is encouraged to invite engineers from industry and professional bodies to deliver seminars/lectures/talks to students. However, this is not meant as a replacement of full-time staff members for teaching purposes
Awareness of the Outcome-Based approach to education	The Evaluation Panel is to assess staff awareness of the Outcome-Based approach to education.

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

Qualification and experience</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>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.

<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>Teaching Staff: Student ratio</td><td>The Evaluation Panel shall evaluate the ratio of teaching staff: student for the programme for the last four academic sessions. The following guide shall be used for evaluation.

<table><tr><td>Poorer than 1:20</td><td>Unsatisfactory</td></tr><tr><td>1:15 – 1:20</td><td>Satisfactory</td></tr><tr><td>Better than 1:15</td><td>Good</td></tr></table></td></tr>
</table>

CRITERION 6 – FACILITIES	
ASPECTS	**GUIDE FOR EVALUATION**
Lecture rooms - quantity provided and quality of A/V	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 associate equipment to cater for multi-delivery modes. Since engineering technology programme requires substantial practice-oriented learning, sufficient and appropriate experimental and practical facilities must be available for students to gain substantial experience in practice-oriented learning as well as in understanding and operating engineering equipment and of designing and conducting experiments. The equipment must be reasonably representative of modern engineering practice. Where practice-oriented learning is undertaken at another institution, or in industry, arrangements must be such as to provide reasonable accessibility and opportunity for learning. IHLs must ensure that all facilities are maintained and adhered to best practices in safety, health and environment where appropriate.
Laboratory/workshop - student laboratory and equipment	
IT/computer laboratory - adequacy of software and computers	
Library/resource centre - quality and quantity of books, journals, and multimedia	The IHL is to have sufficient titles 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.
Other supporting facilities	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.

CRITERION 7 – QUALITY MANAGEMENT SYSTEMS	
ASPECTS	**GUIDE FOR EVALUATION**
Sufficient to assure quality and continuity of the programme	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.
Sufficient to attract and retain well-qualified academic and support staff	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.
Sufficient to acquire, maintain, and operate facilities and equipment	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.
Staff development	The IHL shall systematically plan and provide appropriate training, sponsorship for postgraduate studies/ sponsorship for conferences, sabbatical leave etc. for teaching staff. Similarly, for support staff, the IHL shall provide the opportunities for them to upgrade their competencies through training and practical exposure.
Staff assessment	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.
System for programme planning, curriculum development, and regular review of curriculum and content	The Evaluation Panel should concentrate on auditing the implementation of the quality control system. 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 such as ISO9000 should be encouraged. Other forms of implementation for quality purposes such as external examiners, board of studies, and benchmarking shall also be evaluated. The established system for the programme shall be evaluated to see the effectiveness of such a system towards improvement of overall programme quality.
External Examiner/Advisor report and how these are being used for quality improvement	The programme shall appoint an external examiner to assess the overall quality of the programme. The Evaluation Panel shall examine the external examiner's reports and determine whether the recommendations by the examiners have been implemented by the programme to improve overall quality. Assessment is to be made at least once every two (2) years.

Advisory panel from industries and other relevant stakeholders	The IHL shall have an industry advisory system for participation by practicing engineers or engineering technologists, and employers of engineer technologists or technicians for the purpose of planning and continuous improvement of programme quality. These industry advisors shall be expected to provide inputs and recommendation on an on-going basis through participation in discussion and forums. IAP meeting shall be conducted at least once a year and properly documented.
System for student admission and teaching and learning	The IHL shall establish a working system for student admission as well as teaching and learning.
System of assessment and evaluation of examinations, projects, industrial training, etc. including preparation and moderation of examination papers	The IHL shall establish a working system for examination regulations including preparation and moderation of examination papers. The IHL shall establish a working system for assessment of examinations, projects, industrial training and other forms of learning delivery. The scope of assessment shall be wide enough to cover the achievement of programme outcomes.
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. Teaching 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 teaching 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 diploma 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 Project titles
iv. List of activities that support students' exposure to professional practice. This can include industrial talk, industrial visit, FP collaboration, class-industry collaboration etc.
v. 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. Teaching and Support Staff

i. Standardised CV of each staff member (maximum of two (2) pages).
ii. List of OBE/professional skill/technical training, etc. for academic and support staff
iii. Teaching staff's Engineering Technologist certificate and any other related competency certificates
iv. Support staff's competency certificates
v. List of consultancy, research and development activities by the teaching staff
vi. Professional development plan
vii. 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 1 to 3
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(s)
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 actions

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 ETAC'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 learning 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.
x. 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.
xiv. Documents related to industrial training and/or work-based learning (WBL) and students' report.
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 teaching staff.
xix. Documents related to teaching 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 A

1. Introduction

1.1 This Addendum outlines additional details for accreditation for IHL seeking to register their programmes as Technical and Vocational Education and Training (TVET) programmes with the Malaysia Qualifications Agency (MQA).

1.2 The addendum comprises supplementary accreditation requirements drawn from the MQA's Code of Practice for TVET Programme (COPTPA).

1.3 IHL are also required to refer to the latest COPTPA document published by MQA.

1.4 This addendum is optional and applicable only to IHLs seeking TVET status from MQA for their programme.

2. Programme Outcomes (PO)

2.1 In addition to the eleven (11) PO listed under Section 5.0, TVET programmes are required to have an additional Programme Outcome as follows:

- Personal and Entrepreneurial Skills - demonstrate ability to engage effectively in self-improvement initiatives for career, professional or educational goals and engage in entrepreneurial activities.

3. Qualifying Requirements and Accreditation Criteria

3.1 Teaching and Support Staff

i. In addition to the criterion for teaching and support staff outlined in Section 8, Criterion 5, TVET programmes are also required to meet additional criterion as follows:

- All teaching staff involved in the programme must possess TVET Teaching Competency Certification. This certification must be recognised by either MQA or the Department of Skills Development (DSD).

- The teaching staff involved in teaching the practical components must have a minimum of two (2) years of related industrial* experience in addition to the academic qualifications required by ETAC

- The full-time teaching staff should form at least 60% of the total staff required by the programme.

**IHL may refer to the letter from MQA Bil 17/2021 dated 3 December 2021 – Penerangan Terma Pengalaman Industri, for determining staff industrial experience.*

3.2 Facilities

i. In addition to the criterion for facilities under Section 8: Criterion 6; TVET programmes are also required to meet additional criterion as follows:

- IHL may include facilities made available by industry partners to the student through WBL/apprenticeship/industrial mode, provided that this does not exceed 40% of the total facilities provided.

Addendum B (2)

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

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

1.0 Introduction

This Standard also includes an Optional Addendum (Addendum B2) that outlines additional requirements for accreditation by Institutions of Higher Learning (IHL) in pursuing an additional recognition of tertiary-level computing and IT-related qualifications for their programme. Addendum B2 contains additional accreditation requirements extracted from the Seoul Accord's Graduate Attributes that a programme needs to fulfill. Addendum B2 is optional and only applicable to IHL's seeking additional recognition of tertiary-level computing and IT-related qualifications

2.0 Accreditation Objective

There is no additional requirement to the accreditation objective of the Engineering Technology 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 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.**

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 technology 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.
ii. the programme shall emphasise Complex Problem (CP) and Complex Activity (CA) in teaching and learning practices.

Additional Requirements

1. **Academic Education:** Completion of an accredited programme of study designed to prepare graduates as computing professionals

2. **Knowledge for Solving Computing Problems**: Apply knowledge of computing fundamentals, knowledge of a computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements

3. **Problem Analysis Complexity of analysis:** Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines

4. **Design/ Development of Solutions:** Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations

5. **Modern Tool Usage:** Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations

6. **Computing Professionalism and Society:** Understand and assess societal, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice

7. **Ethics:** Understand and commit to professional ethics, responsibilities, and norms of professional computing practice

8. **Individual and Collaborative Team work:** Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings

9. **Communication:** Communicate effectively with the computing community and with society at large about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions

10. **Lifelong learning:** Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional

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, IHLs may engage part-time staff with acceptable professional qualifications in the related engineering and/or 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 B2, 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 TECHNOLOGY PROGRAMME ACCREDITATION STANDARD 2024

Engineering Technology Accreditation Council
Board of Engineers Malaysia

Engineering Technology Programme Accreditation Standard 2024

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Board of Engineers Malaysia

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ENGINEERING TECHNOLOGY PROGRAMME ACCREDITATION STANDARD 2024