Myanmar Engineering Council

Engineering Education Accreditation Committee

Stage II: Engineering Graduate Capabilities Benchmarked Against FEIAP Education Guideline for Engineer (Draft Version)

Engineering Programme

Accreditation Manual, Policy, Procedure, Guidelines

2020

May 2020

Myanmar Engineering Council

Engineering Education Accreditation Committee

Checklist of Level for Accreditation* / Approval of New Programme**

Please tick:

Sr. No.	Item	Remarks
1.	2020 EEAC Accreditation Manual (Stage I: Engineering Graduate Capabilities Appropiates to a Period of Nation Building	
2.	2020 EEAC Accreditation Manual (Stage II: Engineering Graduate Capabilities Benchmarked Against FEIAP Education Guideline for Engineer)	

Notes on the period for which this Manual takes effect:

1. Accreditation is accorded based on graduation years for students, not intake years.

2. Any new provision or any change to any existing provision in the Manual will take effect on **May 2020** and will be effective for all student cohorts from year 1 to year 6.

3. Where programmes require time to adapt to any change, EEAC will allow adequate time for a reasonable transition to take place as justified by the programme.

4. In continually improving the Standards, the intention of EEAC is to accord the benefits to all students as soon as practically possible.

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ACKNOWLEDGEMENTS

The EEAC would like to acknowledge the contributions by various individuals and organisations in drawing up this Manual which has gone through several revisions. Their service to the EEAC is highly appreciated.

DEFINITIONS

Glossary

MEngC	-	Myanmar Engineering Council
CQI	-	Continual Quality Improvement
EEAC	-	Engineering Education Accreditation Committee
Fed. MES	-	Federation of Myanmar Engineering Society
IHL	-	Institutions of Higher Learning (Universities and Institutions authorized by legislation to award Engineering Degrees)
DHE	-	Department of Higher Education
MOE	-	Ministry of Education
OBE	-	Outcome-Based Education
Matriculation	-	Matriculation Examination (final examination held at high schools)
SLT	-	Student Learning Time

General

Convener	-	Senior Evaluator/any suitable representative appointed by EEAC to advise the Evaluation Team during an accreditation visit.
Evaluation Team	-	A Team of evaluators appointed by EEAC to evaluate an engineering programme for compliance with accreditation criteria.
Evaluator	-	A person appointed by EEAC to evaluate Application for Approval to Conduct a New Degree Programme or evaluate a programme for accreditation or to evaluate a continuing/interim accreditation.
Accreditation Appeals Board	-	A Board to consider appeals from an Institution of Higher Learning on any EEAC decision
Graduate Engineer	-	A person registered under Myanmar Engineering Council Law (2013 November)(Revised 2019) and Chapter VII, Application for Registration Certificate and Issuance of it, Section (52) of Myanmar Engineering Council Rules (10th October, 2014)
Professional Engineer	-	A person registered under Myanmar Engineering Council Law (2013 November)(Revised 2019) and Chapter VII, Application for Registration Certificate and Issuance of it, Section (60) of Myanmar Engineering Council Rules (10th October, 2014)

Institutions of higher Learning and Programme

Department	-	The entity which is responsible for designing and conducting the programme to the accredited.
Programme	-	The sequence of structured educational experience undertaken by students leading to completion, on satisfactory assessment of performance.
Degree	-	Bachelor of engineering programme leading to engineering qualification in Myanmar.
Course	-	Subject offered in the programme.
Stakeholders	-	Parties having an interest (direct and indirect) in the programme output, for example, employers, Industry Advisory Panel (IAP), External Examiners, sponsors, lecturers and students, etc.
Academic staff	-	Staff responsible for teaching and learning activities in the programme leading to the award of an engineering degree.
Student	-	Anyone undertaking an undergraduate programme.
Graduate	-	Anyone who has been conferred a degree.
Support staff	-	Staff responsible for supporting teaching, learning and administrative activities in programme implementation.
External Examiner	-	A person with high academic standing in relevant field appointed by the IHL to assess overall academic programme and quality.
Industry Advisory Panel	-	A body consisting of relevant professionals from industries, government sector, professional organisations, regulatory bodies, alumni etc., appointed by the IHL to ensure programme relevancy to stakeholders' needs.

Accreditation

Approval	-	Permission from the relevant authorities to conduct a new programme.
Accredited Programme	-	An engineering programme whose graduates are acceptable for graduate registration with the MEngC. This is accorded to a programme that satisfies the minimum standard for accreditation set by EEAC.
Accreditation with Interim condition	-	A programme given some conditions to be fulfilled with certain period of time which is shorter than the accorded accreditation period.
Deferred Accreditation	-	This is the 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 as determined by EEAC.
Declined Accreditation	-	This is the status of a programme that fails to meet the minimum standard for accreditation. In such a case, a further application is not normally considered within the next one year.
Cessation/ Termination of Accreditation	-	EEAC reserves the right to cease/terminate the accreditation if there is non-compliance or branch of accreditation requirements after accreditation has been given.
Provisional Accreditation	-	This is given to a programme that has been recommended for approval to be conducted by EEAC.

Myanmar Engineering Council

Engineering Education Accreditation Committee (EEAC)

Policies for Accreditation of Programmes

Effective as of the 2020 Academic Year

Article 1: In accordance with Article 20 of the Myanmar Engineering Council Regulations, the Accreditation Committee has prescribed the Policies for Accreditation of Programme for the purpose of planning and execution of accreditation.

Article 2: Accreditation Committee stipulates this document and the corresponding accreditation criteria to govern all procedures of accreditation.

Article 3: Accreditation is intended to evaluate bachelor degree-granting programmes at universities and colleges recognized by the Ministry of Education.

Article 4: Accreditation Committee establishes a five-year cycle of scheduled reviews for each programme, and the review types are general reviews, interim reviews, subsequent review for action pending programmes, and subsequent review for provisionally accredited programmes. General reviews must be conducted for each accredited programme at intervals no longer than five years for continuous accreditation, whereas the interim reviews, subsequent review for action pending programmes, and subsequent review for provisionally accredited programs are follow-up reviews on the improvement made of the shortcomings observed from the last general review.

Article 5: The accreditation Committee shall be responsible for planning and implementing annual accreditation timetables and for prescribing the Procedures for Accreditation of Programmes. Such procedures shall reflect all requirements for accreditation criteria and shall specify the details of the following major phases:

i. Registration: Describe procedures for publishing of accreditation policies, procedures and criteria, processing registrations, forming evaluation teams, etc.
ii. Review and on-site visit: Describe procedures for reviewing self-assessment report, preparing for on-site visits, conducting on-site visits, etc.
iii. Accreditation decision-making: Describe procedures for drafting accreditation reports, voting and disseminating accreditation decisions, and appealing over the accreditation decisions, etc.
iv. Annual Continuous Improvement Report: Describe requirements with respect to the continuous improvement actions taken by accredited programmes.
v. Interim review of conditionally accredited Programmes: Describe procedures of interim review of conditionally accredited programmes.

vi. Subsequent review for action pending programmes: Describe review procedures for programmes that receive Action Pending in the last general review.

vii. Subsequent review for provisionally accredited programmes: Describe review procedures required for provisionally accredited programmes after the first class of graduates are produced.

viii. Name change: Describe procedures required for an accredited programme that undergoes name change.

Article 6: Accreditation may result in one of the following actions:

i. Accredited:

a) Next General Review: The accreditation is effective for five years cycle.

b) Interim Review (3 years): The accreditation is effective for three years. The accredited programme must submit interim review report and undergo on-site review as basis for consideration of effective period extension.

c) Interim Review (1 year): For programme undergoing second cycle and beyond, if its self-assessment report and the supporting evidences are inadequate but does prove to have achieved the educational objectives and continuous improvement during the on–site visit, it is to be accredited for one year with a new self-assessment report and revisit due the following year with a possibility of extending the accreditation action period of two years maximum.

d) Provisionally Accredited: This action applies to newly established programmes that have yet to produce the first class of graduates if all deemed appropriate.

The programme must notify the Accreditation Committee within three months when the first class of graduates will be produced. The accreditation action will be issued after review of documents on student outcomes.

(ii) Action Pending: Programmes apply for accreditation for the first time and fail to be accredited due to insufficient supporting documents. Such programmes are able to request for subsequent review within two years. Programmes would only be given this decision once per accreditation cycle.

(iii) Not to Accredit: Accreditation Committee shall notify only the programme under review of this decision without public disclosure. A "not-to accredit" programme may submit a new request for evaluation a year later.

Article 7: All personnel of the Accreditation Committee shall strictly abide by the conflict of interest principles and shall assume the obligation of keeping all accreditation documents and their contents confidential. Where necessary, Committee of the Accreditation Committee may stipulate regulations relating to issues of conflicts of interest and confidentiality.

Article 8: Accreditation fees shall be charged separately as the following three types:

i. Registration Fee: Covers the administration, preliminary reviews, and related matters.

ii. Review and On-site Fees: Covers the execution of the review, including costs for administration, document reviews, on-site visits, and related matters.

iii. Annual Accreditation Maintenance Fee: Covers the maintenance of records, including the annual fees with the international accords administration, record storage, quality control, and related matters.

Article 9: This document and any revisions there to shall be approved by Accreditation Committee and promulgated for implementation upon approval of the Accreditation Committee Chairman.

Myanmar Engineering Council

Engineering Education Accreditation Committee (EEAC)

Policies and Procedures for Appeal

Effective as of the 2020 Academic Year

Chapter 1 General Provisions

Article 1: To ensure the rights and welfare of universities and programmes seeking accreditation, the Accreditation Committee of the MEngC Appeal and Review Committee (hereafter referred to as the Committee) to formulate the Policies and Procedures for Appeal according to Article 20(b)-5 of the Myanmar Engineering Council Regulations.

Chapter 2 Request for Appeal

Article 2: Programme that receives a "Not to Accredit" action could appeal to the Committee within two weeks upon receiving the Accreditation Decision Statement.

Article 3: The Committee will only accept request for appeal for the following two reasons:

i. Errors in Procedure: This means that members of the accreditation team violate the policies and procedures for accreditation during the review process.
ii. Errors in Fact: This means that data or other information cited by the accreditation team are incorrect and therefore result in a "Not to Accredit" action. Should the incorrect data and information were indeed provided by the programme, the programme could not request for appeal.

Article 4: Should programme intent to request for an appeal, it must fill out an appeal application form, pay the associated fees, and submit the application with an official stamp of approval by its university.

Chapter 3 Appeal Procedures and Decision

Article 5: The Committee will call for a committee meeting within one month of receiving an appeal application to review the case.

Article 6: After the committee review meeting, the Registrar shall assist to furnish an "Appeal Decision Statement" and send it to the university under review on behalf of the Accreditation Committee.

Article 7: Contents of the "Appeal Decision Statement" must address appeal causes, facts finding, appeal process, basis for appeal decision, and appeal decision, etc. There are two kinds of appeal decisions: "Appeal Established" and "Appeal Denied."

Article 8: The appeal process remains confidential. If necessary, the accreditation team convener, chair, programme evaluators, and representatives of the programme may be invited to be interviewed or to provide written statements.

Article 9: When the appeal is denied, the concerned programme may not appeal again during the same accreditation cycle.

Chapter 4 Execution of the Appeal Decision

Article 10: When an appeal is established, the accreditation committee must appoint an accreditation team to re-review the programme according to the "Appeal Decision Statement" and hold an accreditation action meeting to deliver the accreditation decision.

Article 11: Number of newly appointed accreditation team members is not limited by the Procedures for Accreditation of Programmes, but must not be all from the original accreditation team. Concerned programme may submit names of individuals from the original accreditation team to be avoided.

Article 12: Procedure of the re-review must abide by the Procedures for Accreditation of Programmes.

Article 13: After the accreditation committee delivers the accreditation decision, the Office of the Executive Director will assist to furnish an "Appeal Execution Decision Statement" and send it to the university on behalf of the Accreditation Committee.

Article 14: Contents of The Appeal Execution Decision Statement must include processes, findings and decisions of the re-review, etc.

Chapter 5 Supplementary Provisions

Article 15: Fee schedule for the appeal, including registration fee, re-visit fee, and other related fees, is stipulated separately from the standard accreditation fee schedule.

Article 16: Members of the Committee must abide by the policies on confidentiality and voluntary excuse themselves should there is potential conflict of interest.

Article 17: This document and any revision thereto shall be prepared by the Committee and promulgated for implementation upon approval of the Accreditation Committee.

Myanmar Engineering Council

Engineering Education Accreditation Committee (EEAC)

Procedures for Accreditation of Programmes

Effective as of the 2020 Academic Year

Article 1: Myanmar Engineering Council authorizes the accreditation committee to establish this document in accordance with Article 3 of Policies for Accreditation of Programmes to govern all matters concerning accreditation of programmes.

Chapter 1 Registration

Article 2: Accreditation Committee promulgates accreditation timetable and related documents annually on the MEngC website: www.myanmarengc.org

Article 3: Accreditation Registration

i. A programme seeking accreditation must submit completed Request for Evaluation Form approved by its university to Accreditation Committee before the deadline.

ii. A programme seeking accreditation shall identify the kind of bachelor degree(s). An application for combined review of the bachelor's and beyond degrees programmes may include only one bachelor's and one beyond degree programme with the same chair and with no separate funding. Additional programmes must apply separately and will be charged for additional fees.

iii. Once the request for accreditation is accepted, Accreditation Committee will issue official notice by mail stating the deadlines for submitting further documents and the date of the on-site visit. The programme must then submit a Self-Assessment Report and the on-site visit fee by deadline and prepare for the on-site visit.

iv. Newly established programmes that have yet to produce the first class of graduates may also request for accreditation.

Article 4: Accreditation Team and Editors

i. Upon agreeing the request for accreditation, chair of the accreditation committee shall nominate the accreditation team which is composed of one team chair and additional one to four programme evaluators and who have expertise in the professional domain of the programme. Should there be two or more programmes from one university seeking accreditation during the same

academic year; the Accreditation Committee chair will nominate an accreditation team convener to coordinate the consistencies among the teams. In special cases, the number of programme evaluators in a team may be exempted from the restrictions above.

ii. Registrar shall assign a liaison to each university with administrative matters.

iii. To ensure consistency in accreditation actions, the accreditation committee members shall serve as editors to proofread drafts of the Accreditation Findings Statement and Accreditation Action Recommendation. Consensuses between the accreditation team and editor must be reached on the wording and/or actions in the documents

Chapter 2 Document Review and On-site Visit

Article 5: Review of the Self-Assessment Report

i. Registrar will verify receive of the associated documents and forward the Self-Assessment Report to the accreditation team for review.

ii. Members of the accreditation team shall submit preliminary review findings on the Self-Assessment Report to the team chair prior to the on-site visit.

iii. Having reviewed the Self-Assessment Report, the accreditation team may request for additional information to be presented upon the on-site visit.

Article 6: Preparation for On-site Visit

i. Registrar shall notify the programme by mail with the listing of the accreditation team members two weeks before the on-site visit and assist in the process of finalizing the on-site visit itinerary and list of interviewees.

ii. The programme must display supporting documents during the on-site visit to support its Self-Assessment Report and to demonstrate its compliance with the accreditation criteria.

iii. Registrar is responsible for the arrangement and expense of the accreditation teams associated with the accreditation visit.

Article 7: Accreditation Visit

i. The accreditation team and the programme under review must discreetly follow the on-site visit Itinerary during the review process.

ii. The accreditation team must convene for a pre-departure meeting the night before the on-site visit to review findings from the Self-Assessment Report and reach consensus on the key issues to be investigated.

iii. The accreditation team members must compile collaboratively the Exit Interview Statement during the on-site visit and to announce it at the end of the visit. The programme under review, in return, must reply with the Response to Exit Interview Statement within two weeks from the end of the on-site visit.

iv. The programme under review must ensure that all unrelated personnel not interfering the on-site visit. It must also ban all forms of activities that may disrupt the visit, including but not limited to sound recording, videotaping, photographing, and note-taking. Both the accreditation team and the programme under review must abide by the conflict of interest principles, avoiding all forms of improper reception, gifts, and lobbying.

Chapter 3 Delivery of Accreditation Action

Article 8: Generation of Accreditation Findings Statement and Accreditation Action:

i. The accreditation team chair, on reading the Response to Exit Interview Statement, shall produce a draft of the Accreditation Findings Statement and Accreditation Action Recommendation. These drafts are then proofread by the Editors.

ii. The accreditation Committee shall call for an accreditation action meeting upon the finalization of the Accreditation Action Recommendation. After the accreditation action meeting, Registrar shall mail the accreditation action and the Accreditation Findings Statement to the university and copy the programme under review.

Article 9: Publishing of the Accreditation Action:

i. There are three types of accreditation actions: "Accredited," "Action Pending", and "Not to Accredit."

ii. The accredited status takes effect from the academic year in which the programme under review is accredited. For example, if a programme requested for accreditation on January 1, 2016, had the on-site visit on November 1st of the same year and was accredited for the duration of five

years, then graduates of the programme between the academic years 2016 and 2020 would be recognized by the Accreditation Committee.

iii. For provisionally accredited programme, the accredited status will take effect from the academic year when the first class of graduates is produced. The five year period cycle, however, starts with the year when the programme first registered for accreditation.

iv. Programme receives Action Pending decision; the accredited status will take effect from the academic year when the program receives accreditation. The five year period cycle, however, starts with the year when the programme first registered for accreditation.

v. Each programme will be given its own individuals accreditation action. Actions of all programmes under the same department will be listed on the same accreditation certificate.

vi. Should a programme receive "Not to Accredit" action and object, it may appeal to the Accreditation Committee according to the Policies and Procedures for Appeals within two weeks of receiving the action.

vii. The Accreditation Committee will confer the accreditation certificate and publish the name of the accredited programme on MEngC website and the related media forms upon receiving of the Annual Accreditation Maintenance Fee.

Chapter 4 Annual Continuous Improvement Report

Article 10: Accredited and Provisionally Accredited programmes must submit an Annual Continuous Improvement Report on-line to the Accreditation Committee by July 31st each year. The reports will be taken into consideration in the programme's next review.

Chapter 5 Interim Review

Article 11: Accredited programmes must register with the Accreditation Committee before the specified deadline.

Article 12: The programme must submit the Interim Review Report, which demonstrates the improvement made on the weakness identified from the last review and other areas of continuous improvement.

Article 13: For a programme that must undertake on-site visit, the visit itinerary shall be decided based on the extent of the weakness identified from the last review.

Article 14: After the review, the accreditation Committee shall call for an accreditation action meeting and decide on the date of the next review.

Chapter 6 Action Pending Review

Article 15: Action pending programmes must register with the Accreditation Committee before the specified deadline. The council will decide if additional review fees are needed.

Article 16: The programme must submit the Self-Assessment Report, which demonstrates its compliance with the criteria with sufficient supporting documents and undertake a general review on-site visit.

Chapter 7 Subsequent Review of the Provisionally Accredited Programmes

Article 17: Article 6(a) of the Policies for Accreditation of Programmes stipulates that Provisionally Accredited programmes must issue an official notification through its university to the Accreditation Committee three months before its first class of graduates to be produced.

The Accreditation Committee shall inform the programmes about the structure and requirement of the subsequent review. The programme must submit a report with the following information within two months after the first class of graduates is produced:

Bachelor's degree programme:

i. Evidence of compliance with Accreditation Manual, Qualifying Requirements, Clause -7.0.
ii. Evidence of compliance with Accreditation Manual, Programme Educational Objectives, Clause -8.0,
iii. Evidence of compliance with Accreditation Manual, Learning Outcomes, Clause -8.1.
iv. Evidence of compliance with Accreditation Manual, Accreditation Criteria No.1 to 7, Clause-7.0.
v. Continuous improvement made based on last review.

Chapter 8 Programme Name Change

Article 18: Accredited programmes that underwent name change or reorganization must inform the Accreditation Committee by mail upon obtaining approval from the Ministry of Education. Related documents must be submitted along with the Ministry's approval. Reviews will be conducted to certify that the programme continues to comply with the accreditation criteria.

Article 19: The concerned programme must provide detailed information on changes resulting from the name change or reorganization, e.g. amended educational objectives, graduate attributes, curriculum design, faculty, and space and facilities, etc. The accreditation team that conducted the last review shall review the submitted documents to verify the programme's accredited status. Should an on-site visit is deemed necessary, the accreditation team shall revisit the programme and after which, reports its findings to the Accreditation Committee for final action. Additional fees may be charged if necessary.

Article 20: If a programme under review has name change during the same semester when the accreditation visit takes place, it must provide both old and new curriculum designs for the accreditation team's reference. If accredited, the certificate will be issued in the new name.

Article 21 Should the name change or reorganization render an accredited programme without graduates under the new programme name, it shall be reviewed as a programme seeking provisional accreditation. Otherwise, it will be considered just as other programme seeking accreditation. Accredited programme with name changing must submit evidence clarifying student curriculum match with the new programme name.

Chapter 9 Supplementary Provision

Article 22 Should an arranged on-site visit be prevented by earthquake, flood, typhoon, or other force majeure circumstances, the Accreditation Committee shall re-schedule the on-site visit. Registrar must notify the accreditation team and the programme under review in due time of the contingency measures.

Article 23 This document and any subsequent amendments thereto shall be approved by the accreditation Committee and promulgated for implementation by the Accreditation Committee Chair.

Myanmar Engineering Council

Engineering Education Accreditation Committee

Procedures for Nomination of Accreditation Team Members

Effective as of the 2020 Academic Year

Article 1 The accreditation committee stipulates this document for the purpose of regulating the qualification and responsibility of the accreditation team convener, chair and programme evaluator. It is drawn up in compliance with Myanmar Engineering Council Regulations and Article 5 of Procedures for Accreditation of Programmes.

Article 2 Programme evaluator must attend at least one MEngC programme evaluator training workshop.

In addition, one of the following qualifications applies depending on the nature of their respective background:

i. Academia: Senior professor, either from Myanmar or abroad.
ii. Industry:
    a) At least ten years of practical experience in the industry.
    b) With experience in administration and management.
    c) Non-profit research and development institutes: senior engineer or has held position equivalent to or higher than a section chief.

Article 3 Accreditation team convener and chair must meet at least one of the following qualifications in addition to those stated in Article 2:

i. Having observed an on-site visit, or been a discipline coordinator for a domestic evaluation project.
ii. Having held department chair or above position at a university either in Myanmar or abroad and participate the accreditation affairs actively.

Article 4 Accreditation team convener, chair, and programme evaluator are in charge of the actual execution of accreditation reviews; their responsibilities are:

i. Conduct each visit and interview according to the Accreditation Criteria.
ii. Participate the on-site visit in its entirety and according to the on-site visit itinerary.
iii. Evaluate all supporting document provided by the programme under review.

iv. The Exit Interview Statement shall reflect the Programme's actual merits and areas
for improvement; it shall be provided in written form, using language that is fair, reasonable, clear, succinct, and non-emotional, while complying with the MEngC format.

v. Abide scrupulously by the requirements of the Code of Ethics for Accreditation of Programmes.

vi. In addition to above, the accreditation team convener is also charged with the following:
   a) Serve as representative of the accreditation teams;
   b) Gain in-depth understanding of the effectiveness of the administration of the university and the college;
   c) Coordinate among the accreditation teams to ensure consistency in the review process and accreditation actions;
   d) Compile observation statement about the university and college in the concerned sections in the Accreditation Findings Statement.
   e) Chair the pre-departure meeting for the on-site visit.

vii. Accreditation team chair is also charged with the following:
   a) Serve as the representative of the accreditation team for the programme;
   b) Chair the on-site visit of the programme;
   c) Compile the Accreditation Findings Statement and Accreditation Action Recommendation.

viii. In addition, the accreditation team convener and chair must attend and participate the accreditation action meeting of the academic year they are appointed the position.

Article 5 Qualified candidates who agree to abide by the above may be nominated by the accreditation Committee chair after signing the Conflict of Interest and Confidentiality Agreement. They shall be appointed on approval by the chair of the Accreditation Committee.

Article 6 This document and any subsequent amendments thereto shall be approved by the accreditation committee and promulgated for implementation by the Accreditation Committee Chair.

Myanmar Engineering Council

Engineering Education Accreditation Committee (EEAC)

Timeline for Accreditation

Effective for Reviews for the 2019-2020 Accreditation Cycle

2020 January	**Accreditation policies and procedures Published**
2020 February	**Accreditation Orientation for Institutional Representatives Rectors and Head of Department Forum**
2020 February	**Deadline Request for Accreditation**
2020 February	**Deadline Request for Interim**
2020 March	**Programme Evaluators workshop**
2020 May	**Cornerstone, Keystone, Capstone, IDP course workshop**
2020 July 31	**Deadline for Self-Assessment Report, interim review report, and annual continuous improvement report**
2020 August	**Accreditation Workshop for New Programme Chair**
2020 September	**Conveners, Team Chairs meetings**
2020 October	**Accreditation Workshop for New Programme Chair**
2020 October	**Interim On-site visit**
2020 October to December	**On-site visit**
2021 January	**Editors Meeting**
2021 March	**Accreditation Decision Meeting**
2021 March	**Accreditation Decision Published**
2021 May	**EEAC General Assembly, Accreditation certificate conferment ceremony for 2020-21 accreditation cycle.**
2021 July	**Accreditation Period End**

* Specific dates of varies workshops/conferences will be announced at later times.

Myanmar Engineering Council

Engineering Education Accreditation Committee (EEAC)

Accreditation Team Convener

On-Site Visit Schedule Template

For General Review Use

The convener is advised to interview the following institution officials: President (Vice President/Secretary-General), Provost, Dean for Research and Development, and Chair of programme under review

Day 0

Time	Event / Goal	Attendees	Location
18:00 – 21:00	**Dinner and Preliminary Meeting**	Accreditation Team	Local hotel

Day 1

Time	Event / Goal	Attendees	Location
09:00 – 09:30	**Presentation by Institution Administrators**	List provided by the programme, including institution administrators, programme chairs, and faculty	Provided by the programme
09:30 – 09:50	Traveling time to the meeting spot		
09:50 – 10:20	**Interview with the Institution Administrator 1**	List provided by the programme	Provided by the programme
10:20 – 11:00	Break		
11:00 – 11:30	**Interview with the Institution Administrator 2**	List provided by the programme	Provided by the programme
11:30 – 13:00	Lunch		
13:00 – 14:00	**Tour Computing Center, Library, etc…**	List provided by the programme, including Facility managers	Provided by the programme
14:00 – 14:30	Break		
14:30 – 15:30	**Confirming the List of Questions for the Institution Administrators**	Convener and team liaison	Provided by the programme
15:30 – 16:00	Break		
16:00 – 16:40	**Interview with the Institution Administrator 3**	List provided by the programme	Provided by the programme

Day 2

Time	Event / Goal	Attendees	Location
09:00 – 10:00	**Meeting with the Institution Administrators** Discussion with institution on topic of administration and funding	List provided by the institution Institution Administrators ONLY	Provided by the programme
10:00 – 10:20	Traveling time to the meeting spot		
10:20 – 11:50	**Interview with the Institution Administrator 4**	List provided by the programme	Provided by the programme
10:50 – 11:10	Break		
11:10 – 12:10	**Visit to Teaching Facilities and Campus Tour**	List provided by the programme, including Facility managers	Provided by the programme
12:10 – 13:30	Lunch	Accreditation Team	Provided by the programme
13:30 – 15:00	**Lunch and Accreditation Team conference** Discussion on consistency of the Exit Statements		
15:00~	**Announcement of the Exit Statement** Team chair announces the Exit statement	List provided by the program, including institution administrators, programme chairs, and faculty	Provided by the programme

Myanmar Engineering Council

Engineering Education Accreditation Committee(EEAC)

On-Site Visit Schedule Template

For General Review Use

Day 0

Time	Event / Goal	Attendees	Location
18:00 – 21:30	**Dinner and Preliminary Meeting** Topic: (1) Reviews on the self-assessment report (2) Workload distribution and triangulation questions (3) Discussion on grouping of alumni, industry representatives, and students interviews.	Accreditation Team	Local hotel

Day 1

Time	Event / Goal	Attendees	Location
09:00 – 09:30	**Presentation by Institution Administrators** An overview of the institution	List provided by the programme, including institution administrators, programme chairs, and faculty	Provided by the programme
09:30 – 09:45	Traveling time to the meeting spot		
09:45 – 10:15	**Presentation by Chair of the Programme** An overview of the programme and additional comments on the Self-Assessment Report	List provided by the programme, Including program chair and faculty	Provided by the programme
10:15 – 11:00	**Meeting with the Program Faculty** Questions on the Self-Assessment Report from the accreditation team	List provided by the programme, including programme chair and faculty	Provided by the programme
11:00 – 11:10	Break		
11:10 – 11:50	**Interview with Alumni on** Performance of the graduates	5 Alumni Attendee list provided by the programme	Provided by the programme
11:50 – 12:30	**Interview with Industry Representatives on** The partnership between the programme and industry	5 Representatives Attendee list provided by the programme	Provided by the programme

Time	Event / Goal	Attendees	Location
12:30 – 13:00	Lunch	Accreditation Team	Provided by the programme
13:00 – 13:20	**Drafting the Questions for the Institution Administrators**	Accreditation Team	
13:20 – 14:40	**Inspections and Reviews Documents on Display** Discussion of Self-Assessment Report supporting evidence	Accreditation Team	
14:40 – 15:40	**Facilities and Space Study** Assessment on teaching resource and environment. Labs, libraries, etc…	Programme chair, lab managers, and technicians. Attendees provided by the programme	Provided by the programme
15:40 – 15:50	Break		
15:50 – 17:00	**Interview with Students** Assessment on student outcomes	No more than 30 Students Attendees provided by the programme	Provided by the programme
17:00 – 18:00	Return to Hotel		
18:00 – 22:00	**Dinner and Winding-up Meeting -** (1) Exchanges of finding (2) Drafting Exit Statement (3) Discussion on consistency of the Exit Statements	Accreditation Team	Local hotel

Notices: The attendees and purpose of the Interview or inspection period is and should be as follows:

1. Alumni (5 people) should be graduates from the department within the past 10 years. The majority of the interviewees should be graduates of the bachelor's program. No more than one interviewee should be graduate of the post baccalaureate program
2. Industry representatives (5 people) who are the employers, businessmen, education advisers, and of education-industry partnership background with employer relationship with graduate of the program.
3. For interview with students (20 undergraduate students) (must have 3 students from continuing education program if such program is reviewed) by years, genders, grades (high, middle, low). For combined department, (30 students) (must have 3 students from continuing education program if such program is reviewed).For independent graduate program, select 15 students (must have 3 students from continuing education program if such program reviewed). Five interviewee slots be with first year students.

Day 2

Time	Event / Goal	Attendees	Location
09:00 – 10:00	**Meeting with Institution Administrators** Discussion on the administration and funding	List provided by the institution Institution Administrators ONLY	Provided by the programme
10:00 – 10:15	Traveling time to the meeting spot		
10:15 – 11:15	**Interview on Faculty** Discuss in-depth on curriculum design and student outcomes	Attendee list provided by the programme Faculty ONLY	Provided by the programme
11:15 – 12:00	**Inspections and reviews of Documents Display of** Discussion of Self-Assessment Report supporting evidence	Accreditation Team	Provided by the programme
12:00 – 12:30	**Exist Interview with Chair of the Program** Final clarification on issues	Program Chair	Provided by the programme
12:30 – 13:00	Lunch	Accreditation Team	Provided by the programme
13:00 – 15:00	**Accreditation Team Meeting** Discussion on consistency of Exit Statements		
15:00 ~	**Announcement of the Exit Statement** Team chair announces the Exit Statement	List provided by the programme, including institution administrators, programme chairs, and faculty	Provided by the programme

Myanmar Engineering Council
Engineering Education Accreditation Committee (EEAC)
On-Site Visit Schedule Template
For Interim Review Use

Interim review guidelines:

1. Please provide the following records and data: (1) Official presentation of the institution, (2) Records and results of alumni and industry representatives' feedback, (3) List of changes in equipment and facility.
2. Accreditation team will choose three events among the following to be carried out during the on-site visit: (1) Interview alumni, (2) Interview industry representatives, (3) Tour facilities and space, (4) Interview students, (5) Interview faculty, and (6) Inspection and review of documents on display.

Day 0

Time	Event / Goal	Attendees	Location
18:00 – 21:00	**Dinner and Pre-departure Meeting** Topic: (1) Reviews on the Self-study Report (2) Workload distribution and triangulation questions	Accreditation Team	Local hotel

Day 1

Time	Event / Goal	Attendees	Location
09:00 – 09:30	**Presentation by Chair of the Programme** Responses to the previous accreditation action and steps taken in continuing improvement by the program. Further information to support the Self-study Report	*List provided by the programme, including programe chair and faculty*	Provided by the programme
09:30 – 10:20	**Meeting with the Program Faculty** (1) Questions on the Self-study Report from the accreditation team (2) Topics on the program's planning and outcome	*List provided by the programme, including programme chair and faculty*	Provided by the programme
10:20 – 10:30	Break Time		

10:30 – 11:10	**Interview/Tour period 1**	*List provided by the programme*	Provided by the programme
11:10 – 11:50	**Interview/Tour period 2**	*List provided by the programme*	Provided by the programme
11:50 – 12:30	**Interview/Tour period 3**	*List provided by the programme*	
12:30 – 13:00	Lunch	Accreditation Team	
13:00 – 14:00	**Inspections and Reviews** **Documents on Display** Discussion of Self-study Report supporting evidence	Accreditation Team	
14:00 – 14:30	**Exist Interview with Chair of the Program** Final clarification on issues	*Programme Chair*	Provided by the programme
14:30 – 16:00 16:00~	**Accreditation Team Meeting** Drafting the Exit Statement **Announcement of the Exit Statement** Team chair announces the Exit Statement	Accreditation Team *List provided by the programme, including programme chair and faculty*	Provided by the programme Provided by the programme

Notices: The attendees and purpose of the interview or tour period is and should be as followed:

1. Alumni (5 people) should be graduates from the department within the past 10 years. The majority of the interviewees should be graduates of the bachelor's programme. No more than one interviewee should be graduate of the post baccalaureate programme.
2. Industry representatives (5 people) cannot be alumni. They are to be employers, businessmen, education advisers, and of education-industry partnership background with employer relationship with graduate of the programme.
3. Tour facilities and space is to be carried out for the purpose of understanding their usage by and support to and from the programme.
4. For interview with students please have the department select 20 students (must have 3 students from continuing education programme if such programme is reviewed) by years, genders, grades (high, middle, low) for the undergraduates. For combined department please have the programme select 30 students (must have 3 students from continuing education programme if such program is reviewed). For independent graduate program, please have the programme select 15 students (must have 3 students from continuing education programme if such programme reviewed). Five interviewee slots be first year students is recommended.

5. Interview with faculty is to gain insight to the course design and graduate attributes. Please have the program provide a list of attendees. The attendees should be those with no teaching commitment during the subject hour.

1. Attachment 1: Alumni attendees

#	Name	Employer	Title	Graduation Year
1				
2				
3				
4				
5				

2. Attachment 2: Industry representative attendees

#	Name	Company	Title	Relation to the programme
1				
2				
3				
4				
5				

3. Attachment 3: Tour labs, offices, library, etc…

* List can be expanded if needed

Events	Facility name	Facility manager	Location
1			
2			

4. Attachment 4: Student attendees

* List can be expanded if needed

#	Name	Year	Class	Student ID #	Gender	Class Rank/Grade

Note: For first year undergraduate and graduate students please provide methods of enrollm

5. Attachment 5: Faculty attendees

* List can be expanded if needed

#	Faculty Name	Title	#	Faculty Name	Title

Myanmar Engineering Council

Engineering Education Accreditation Committee (EEAC)

Accreditation Fee Schedule

Article (1) This document is drawn up by the Accreditation Committee in compliance with Article 8 of Policies for Accreditation of Programmes.

Article (2) There are three types of accreditation fees: Registration Fee, Review fee, and Annual Accreditation Maintenance fee. For interim review, the Accreditation Committee shall not charge additional Registration fees.

Article (3) The Registration Fee and the Annual Maintenance Fee will be charged by department whereas the Review Fee will be charged by the number of programme under the same department. Programme that applies for accreditation in different year from the other programmes under the same department may be charged for additional fees.

Article (4) Accreditation Fee shall be received in Myanmar Kyats. Please note that all local transfer fees are to be paid by the sender. The fee rate is stated in the schedule of Fees.

Article (5) Accreditation Fee shall be paid before the deadline .One percent penalty on the total fees will be added for delays every 7 days.

Article (6) Methods of payment:

I. Check: address to Myanmar Engineering Council
II. Post transfer, account :(……..), payment to: Myanmar Engineering Council.
III. Bank transfer, account: (……), payment to: Myanmar Engineering Council,

Article (7) For cancellation of accreditation within 7 days of payment, 50% of the Accreditation Fees will be refunded .No refund will be made beyond the 7^{th} days.

Article (8) Accreditation programme is required to pay Accreditation Maintenance Fee according to the length of accredited period. EEAC reserves the right to withdraw the accredited status if payment is not made in due time.

Article (9) Programme within the accredited status wishes to register for a change in accreditation criteria will be subject to a documentation review and K 450,000 fee.

Article (10) Programme maintaining multiple accreditation status will be required to pay Annual Accreditation Maintenance fee in full according to the length of accredited status.

Article (11) Programme applies for an appeal shall pay an appeal fee of Kyats 850,000.

Article (12) Programme applies for re-issuing the accreditation certificate shall pay a fee of K100,000 Certificate will only be reissued once per accredited period.

Article (13) Any fee not covered by the above procedures, the Accreditation Committee will refer to Policies for Accreditation of Programmes for ruling.

Article (14) Any revisions of this schedule shall be published on the MEngC website. The Accreditation Committee will invoice the programme with attachment of revised fee schedule.

rticle (15) This document and any subsequent amendments thereto shall be approved by the Accreditation Committee and promulgated for implementation by the Accreditation Committee Chair.

Attach: Schedule of Fees

Fee Type	**Fee**		**Charge (kyats)**
General Review (Provisionally Accredited/ Full Accredited)	Registration Fee		250,000
	Review Fee	Programme Base Fee	2,150,000
	Annual Accreditation Maintenance fee (Per year)	Accredited	200,000
		Provisionally Accredited	100,000
Follow Up Review	Revisit Visit Fee(Per Trip)	Action Pending	850,000
		Provisionally Accredited	850,000
		Interim Visit	1,075,000
Appeal	Appeal Fee		850,000
Changes in Criteria	Document Review Fee		450,000
Certificate Reissue	Certificate Reissue - Fee		100,000

Notes: 1. A programme's Review Fee will be based on the number of programme. The maximum fee includes Registration Fee, Review Fee, and Annual Accreditation Maintenance Fee for programmes within the same department in the same period.

2. Annual Accreditation Maintenance Fee shall be paid in full on the valid accredited period engineering is to be accredited for 3 years. The department is required to pay the Annual Accreditation Maintenance Fee of 600,000 kyats in full.

3. A Programme for foreign University which delivers in Myanmar will be –

Registration Fee	-	450 USD
Review Fee	-	3900 USD
Annual Accreditation Maintenance Fee (Per year)		
Accredited	-	300 USD

Myanmar Engineering Council

Engineering Education Accreditation Committee (EEAC)

Guidelines for Accreditation

Programmes request for accreditation must follow Myanmar Engineering Council, Accreditation Committee "Accreditation Manual".

Applying for Accreditation

1. EEAC is to accredit programmes that grant bachelor's degree from Ministry of Education.
2. Registration is according to the MEngC office procedures.
3. For the cost of accreditation, please review MEngC Accreditation Fee Schedule.
4. After registration, for any reason the programme cannot proceed with the review, institution of the programme must apply for an extension or cancelation. Accreditation Committee reserves the right of refusal. For programme already in the review process, such requests cannot be raised by institution.
5. University-level and programme-level liaisons and programme chairs are highly encouraged to attend the EEAC accreditation workshops on a regular basis. If the chair of registered program has never attended the accreditation workshop, MEngC may suspend the accreditation process. Meanwhile, please notify EEAC immediately for any administrator, liaison, or programme name changes.

Reports:

6. For formatting information, including page limitation, indexing, binding, etc…, please refers to EEAC "Accreditation Manual."
7. Programme head must sign and check on the Self-Assessment /interim Report Checklist.
8. Please have the institution of the programme send 5 copies of the Self-Assessment Report (per programme), including the electronic version to MEngC before July 31th .Have all the reports from one institution on one CD (report and supplements) along with the paper report. Self-Assessment Report must be received by MEngC by July 31th. Any information added / changed after the deadline should be presented during the on-site visit. MEngC and the accreditation Committee will not accept a later version of the Self-Assessment Report.

On-Site –Visit:

9. Programme under its first general – review must submit at least 1 year complete records and evidence of student outcomes. Programme under second general review need to have such documents from the past 5 years.
10. Presentation by the head of the programme should be focused on supplementing the Self-Accreditation report and highlights of the programme. Please avoid repeating the report contents.
11. The MEngC liaison will email grouping arrangements of interviews the night before the on-site visit. Please have the programme liaison be on call and assist in the event.
12. Interviewees are highly valuable sources of information. Programme under review must assist in arranging the interviews. If the interview time is in conflict with student class

hour, please provide another period for the interview and adjust the schedule accordingly. Also, due to compact schedule, programme should coordinate closely with the review team to be punctual.

13. For safety and confidentiality, none of the visiting activities could be filmed, photographed, voice recorded, or documented during the on–site visit except when prior to the presentation by institution / programme on the first day of the visit.
14. Except for the Accreditation Committee invited observers, no other visitor is allowed to observe the visit; also, to abide the conflict of interest principles, the programme, and its institution, shall not pressure or present any inappropriate reception and/or gift to the evaluators. Any communication to the evaluators from the institution shall be passed on the MEngC liaison to ensure the objectivity of the review.
15. Please provide means for internet connection and have the programme liaison prepare an empty A4 size box for the review team to collect any disposable papers.
16. In the event of earthquake, flood, cyclones, or other force majeure that prevented an on-site visit from taking place. MEngC will notify the accreditation team and programme under review. MEngC will reschedule the on-site-visit.

Accreditation Action:

17. With the completion of the on –site visit. The Exit interview Statement shall be announced on site. The statement will cover only the programme's advantages and shortcomings. Neither the accreditation action will be presented: nor will any further discussion take place after the announcement.
18. Two weeks after receiving the Exit Interview Statement, the institution of the programme shall send the Response to Exit Interview Statement to the MEngC liaison, which will then be submitted to the review teams for completion of the Accreditation Statements and Recommendation of Accreditation Action.
19. The Response to Exit Interview Statement shall be focused on any errors in facts in the Exit interview Statement. Any future improvement plan and statement should not be in the response.
20. MEngC shall grant accreditation action for each degree programme in the institution.

Other:

21. Accredited programmes are accredited by MEngC, Engineering Education Accreditation Committee (MEngC), not by FEIAP, ABET, Washington accord, Seoul Accord, or any other organization.
22. When announcing the accreditation action, institution of the programme should not reveal accredited period.
23. Programmes are not authorized to disclose any information about the review team, including the EEAC liaison, at any time.

Myanmar Engineering Council

Engineering Education Accreditation Committee (EEAC)

Guidelines on Drafting the Exit Statement

Effective as of the 2020 Academic Year

Statement:

1. In principle, strength and area for improvement statement should keep to maximum of 3 points. Statement should not go beyond the criteria requirement.
2. Statement should not make or suggest any comment that makes comparison between different institutions or programmes.
3. Statement should not be overly focused on faculty/student ratio or similar points, but rather on what could happen with non-compliance of a criterion.
4. For statement of strength, please point out the programme's uniqueness. For simply compliance of a criterion, no statement of strength is needed. Please do not repeat the wording of the criteria and make them strengths.
5. For area for improvement, please point out how the programme is not in compliance of the criteria. Please do not give statement suggesting specific way of improvement. Detail explanation is needed with Concern, Weakness, and Deficiency in the level of compliance. Three areas are to be considered in drafting the statement: what is asked by the criterion? Is the evidence sufficient? And what will be the effect of noncompliance? Ex: Graduate attributes in criterion 2 is described being attained through surveys without direct evidence; other type of assessment should be considered and needed.
6. All comments of substance should be made into actual statements in the strength or, improvement sections and not to be mentioned only in oral discussions or put into the observation part of the exit statement.
7. The observation section is for commenting on non-criteria related findings. Maximum of 2 points in principle.
8. After reviewing the programme's response to the exit statement, statements on the final accreditation statement can be modified or removed. New additional entry is not recommended.

Criteria and Statement Entries

1. Compliance of a criterion and accreditation statement should correlate each other.
2. Programme Educational Objectives, Graduate Attributes and Curriculum are the most important criteria. If criterion, Graduate Attributes and Curriculum is a Concern, Programme Educational Objectives should not be an Observation in level of compliance.
3. If a programme has any criterion that is a Deficiency in compliance; not to be accredited is recommended.
4. For programme in the second cycle, if most criteria are Observation in level of compliance (including Criterion Graduate Attributes and Curriculum), along with few Concerns, to be accredited for a full accreditation cycle (5 year) is recommended.

5. For the purpose of monitoring the effects of continuous improvement, if a department's programmes are currently in the second cycle with additional program being accredited for the first time, the whole department is required to go through an interim review.
6. For a programme applies for accreditation for the first time and fails to be accredited due to insufficient supporting documents, action pending is recommended.
7. For programme undergoing second cycle and beyond, if its self-assessment report and the supporting evidences are inadequate but do prove to have achieved the educational objective and continuous improvement upon the observation during the on-site visit, it is recommended to be accredited for one year. But, if the programme fails to prove to have achieved the educational objective and continuous improvement, not to be accredited is recommended.
8. If a programme under interim review is lacking in continuous improvement; not to be accredited is recommended.
9. For a combined department (a bachelor's programme and a master's programme in one) under interim review, it is advised to harmonize the accreditation actions between the two programmes. Ex: An interim review bachelor's programme that has already received 2 years accreditation is getting a 4 years accreditation result; its graduate programme should get the same 4 years accreditation for synchronization purpose.

Myanmar Engineering Council

Engineering Education Accreditation Committee (EEAC)

Code of Ethics for Accreditation of Programmes

Effective as of the 2020 Academic year

Article (1) To ensure objectively and fairness of the accreditation process and action and to maintain confidentiality of all accreditation documents and decision–making process, this document is drawn up by the Accreditation Committee in compliance with Article 7 of Policies for Accreditation of programmes. All Committee members, staff, and members of accreditation team who are associated with the Accreditation Committee must abide scrupulously by the following in their accreditation undertakings and professional conducts.

Article (2) All personnel associated with the Accreditation Committee and members of the accreditation team shall identify with the values and spirits of accreditation. They must uphold the honor and credibility of the community by exhibiting professionalism, fairness, and respect for others when executing accreditation.

Article (3) For the purpose of sustaining the impartiality and independence, members of the Appeal and Review Committee may not be appointed as member of the accreditation team.

Article (4) Accreditation team members must attend at least a programme evaluator training workshop, comply with accreditation principles, and conduct each review and interview as regulated by the Accreditation Criteria.

Article (5) Individuals affiliated in the following respects with a programme under review must voluntarily identify and avoid being involved in the accreditation process:

i. Having , in the past three years, held or is currently holding a full-time or part-time position in the programme;
ii. Having awarded the highest academic degree by the programme;
iii. Having awarded an honorary degree by the university that the programme belongs to;
iv. Having spouse or relative up to twice removed work or enroll in the programme;
v. Holding a paid position, as member of an advisory committee member or a board member ,etc. in the university that the program belongs to;
vi. Serving as a member of the programme's advisory or self–Accreditation committee during the same academic year when the accreditation occurs;
vii. Having any other stake-holding affiliation with the Programme that is capable of undermining accreditation objectivity.

Article (6) Accreditation team members must exhibit genuine dedication to their work, carefully examining the programme's Self –Assessment Report and related documents prior to the review. Compliance with the accreditation timeline is required. In addition to full participation of every accreditation procedure, members should avoid tardiness and early departure.

Article (7) Accreditation team members must cooperate in mutual respect. They must not shirk responsibilities or workload, cite professional recommendations from other members without their consent, or probe into/criticize privacy/opinions of other team members.

Article (8) Accreditation team members and staff must remain impartiality, declining all forms of lobbying, improper reception, and gifts. Office of the MEngC shall arrange and pay for the expenses for the accreditation team's meals, accommodation, and transportation during the on-site visit.

Article (9) Accreditation team members must endeavor to speak in moderate manner, express sincerity, listen attentively and respect the input of the programme; they should refrain from excessive communication and feedback, and consciously adhere to the roles of a "interviewer" and "listener".

Article (10) Accreditation team members must examine the documents for accuracy and completeness through triangulations, and allow the programme to explain and respond. The team must record the programme's actual merits and areas for improvement in written form that complies with the MEngC format, using language that is fair, reasonable, clear, succinct, and non –emotional.

Article (11) Accreditation team members must keep their identities confidential prior to the review. Direct contact with the programme seeking accreditation should be avoided. They shall contact MEngC liaison should any requests concerning accreditation arise. Prior to the promulgation of the accreditation action, members of the accreditation team should not give lectures or attend activities related to accreditation on invitation by the programme or the university.

Article (12) Documents provided by the programme are to be used exclusively for accreditation purposes. Disclosure is forbidden unless formal authorization is otherwise obtained from the programme. Accreditation forms filled out by accreditation team members, as well as any meeting minutes or records of discussions during the accreditation process are also classified information, not to be disclosed to the public.

Article (13) All individuals involved in reviewing documents during the accreditation process must observe the confidential principles and are forbidden to publicly discuss the contents. Individuals involved with the deliberation of accreditation actions are also forbidden to discuss the matter in public.

Article (14) Accreditation team members and staff must sign the Conflict of interest and Confidentiality Agreement before nomination, and re-endorse the agreement should further amendments be made.

Article (15) All members, staff, and accreditation team members associated with the Accreditation Committee are responsible for familiarizing themselves with this regulation; all ethics-related issues should be confronted , treated , and addressed based document.

Article (16) This document and any subsequent amendments thereto shall be approved and promulgated for implementation by the Accreditation Committee.

1.0 Introduction

The Myanmar Engineering Council (M.Eng.C) registers graduates and professional engineers under the Myanmar Engineering Council Law (2013 November) (Revised 2019). The pre-requisite for registration as a graduate engineer is a qualification in engineering recognized by the Council.

There has been an increasing need and demand for accreditation of educational mes in engineering due to the growing number of students seeking assurance on the standards of programmes being offered by IHLs and the emergence of more IHLs providing education in engineering.

The Engineering Education Accreditation Committee (EEAC) was delegated by the M.Eng.C (Myanmar Engineering Council) to be the body for accreditation of engineering programmes. It is a non-governmental organisation and has the support of stakeholders in the engineering profession.

M.Eng.C has a duty to ensure that the quality of engineering education/programme of its registered engineers attains the minimum standard comparable to global practice.
This Manual outlines details for accreditation of an engineering programme in Myanmar. It serves to facilitate IHLs to meet the minimum standard stipulated for the accreditation of their existing engineering programmes or newly proposed programmes. This Manual includes elements of outcomes in the engineering curriculum to ensure a Continual Quality Improvement (CQI) culture in the spirit of Outcome-Based Education (OBE).

2.0 Composition of Engineering Education Accreditation Committee

The Engineering Education Accreditation Committee (EEAC), representing MEngC shall be an independent body for the accreditation of engineering programmes. The members of EEAC shall be appointed by MEngC President in consultation with the council members for a period of four years in accordance with the 15 members nominated by M.Eng.C. The EEAC Chair is elected by the MEngC members and shall hold office for the duration of his appointment as EEAC chair.

Members of EEAC shall be appointed by MEngC as follows:

a) A Chairman (elected by MEngC)

b) 14 members representing each of major branches (e.g. Civil, Mechanical, Electrical, Chemical and Electronics) and each of the constituent organizations nominated by MEngC.

The EEAC shall comprise persons from academic institutions and industries. Appointment of the members of EEAC shall maintain a reasonable spread of expertise across various branches of engineering.

The final decision on the membership of the EEAC is with the MEngC. All members shall be professional engineers.

The terms of reference of EEAC are:

a) to implement the accreditation policy of the MEngC;

b) to formulate guidelines and procedures for accreditation;

c) to appoint an Evaluation Team to accredit each engineering programme;

d) to receive and review evaluation reports by the Evaluation Teams, and decide on whether accreditation should be granted, as well as the conditions to be imposed, if there is such a need;

e) to respond to the Council of MEngC on complaints and appeals regarding the accreditation process;

f) to represent MEngC in mutual recognition agreements on academic qualifications and professional membership with other countries;

g) to report periodically to the MEngC on its work.

Myanmar Engineering Council

Engineering Education Accreditation Committee

Members

1.	Prof. Dr. Zaw Min Aung	Chairman
2.	Prof. Dr. Myint Thein	Committee Member
3.	Prof. Dr. Sint Soe	Committee Member
4.	Prof. Dr. Myo Nyunt	Committee Member
5.	Prof. Dr. Aye Myint	Committee Member
6.	Mr. Win Khaing Moe	Committee Member
7.	Prof. Dr. Mi Sandar Mon	Committee Member
8.	Prof. Dr. Thein Tan	Committee Member
9.	Prof. Dr.Kaythi Lwin	Committee Member
10.	Prof. Dr. Oo Oo Khin	Committee Member
11.	Prof. Dr. Myint Myint Khine	Committee Member
12.	Dr. Sann Oo	Committee Member
13.	Prof. Dr. Mya Mya Oo	Committee Member
14.	Prof. Dr. Aung Kyaw Myat	Committee Member
15.	Mr. Thaung Tin	Committee Member

3.0 Accreditation Objective

The objectives of accreditation are

a) to ensure that graduates of the accredited engineering programmes satisfy the minimum academic requirements for registration as a graduate engineer with Myanmar Engineering Council (MEngC).

b) to provide feedback to the IHLs for the improvement and development of educational programmes in engineering that can better meet the needs of the local industry.

c) to ensure that Continual Quality Improvement (CQI) is being practiced by IHLs. Accreditation may also serve as a tool to benchmark engineering programmes.

4.0 Engineering

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

5.0 Accreditation Policy

This section outlines the EEAC's accreditation policy underlying the accreditation process. Accreditation will be considered upon a written request from IHLs.

5.1 The Accreditation Process

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

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

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

5.2 The Accreditation Cycle

Accreditation is accorded to a programme for a maximum period of six (5) years per cycle. The period that IHL shall apply for accreditation is mentioned in Section 6.1.

Accreditation is accorded on a forward-based full programme cycle basis, specifying the years following and including the year approval is given.

5.3 Programmes

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

If the 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 7 of this Manual.

5.4 Application and Preparation for Accreditation Visit

The IHLs shall make an application for programme accreditation as per the requirements of Section 8 of the Manual to the EEAC. Appendix D shows the process flow chart on Application for Accreditation and Approval of Engineering Programmes.

The accreditation visit shall be deferred if the submitted documents are of unacceptable quality, or do not follow the required format of Section 8 of the Manual. In such a case, the IHLs shall resubmit the application.

If the documents submitted followed the required format, but the contents are found to be inadequate, the IHLs shall be required to provide further information, or clarification. If the IHLs does not provide further information in good time for the visit, the EEAC may cancel the visit.

5.5 Accreditation Evaluation

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

The evaluation exercise shall be conducted by an Evaluation Team (consisting of three (3) members) for new programme and new cycle accreditation; or an Evaluator (consisting of only 1 member) for interim or continuing accreditation appointed by EEAC (refer to Appendix A).

5.6 Accreditation Decision

Upon completion of the new or new cycle programme accreditation exercise, the EEAC, based on the recommendation of the Evaluation Team, may decide one of the following conditions for the graduating cohorts:

(i) To accord full accreditation for five (5) years.

(ii) To accord accreditation for less than five (5) years.

(iii) To defer accreditation. This is to allow the IHL to fulfil condition(s) that may be imposed by the EEAC. 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 year.

Programme accredited without any concerns is accorded a full 5-year accreditation without any condition. Programme with any weakness shall be deferred or declined accreditation. Programme accredited with concerns is accorded accreditation for five (5) years or less **with condition(s)**, subject to the decision of the EEAC.

The IHLs shall take appropriate actions to remedy the concern(s),and submit evidence of such corrective action(s). 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 is upheld, or the remaining period of the accreditation may be accorded by the EEAC for continuing accreditation.

Failure to address the concern(s) may result in cessation of accreditation at the end of the stated period.

The EEAC's decision shall be sent to IHLs. The accreditation shall be accorded to a specific programme pathway (location and mode).

5.7 Revisions to an Accredited Programme

The IHLs shall update the EEAC of major changes (such as, 30% or more of the curriculum, location, pathways, programme name or programme duration) that may impact an accredited programme. Failure to do so may cause the EEAC to reconsider the accreditation decision awarded earlier. The EEAC may then direct the IHLs to apply for re-accreditation of the revised programme.

5.8 The Approval to Conduct a Programme

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

The IHLs should submit the complete set of documents as specified in Section 8 of this Manual to the EEAC for programme evaluation. The recommendation from EEAC shall be forwarded to the relevant authorities. The evaluation exercise shall be conducted by an Evaluator appointed by EEAC (refer to Appendix A).

When the documents are considered to be inadequate, the IHLs 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 IHLs no longer intends to conduct the programme.

5.9 Publication of Accreditation Status

EEAC shall regularly update the list of accredited programmes on the website.

5.10 Appeal Procedures

The EEAC decision is final. However, an IHLs may appeal against a decision made by the EEAC. The notice of appeal must be made in writing to the Accreditation Appeals Board within two (2) weeks upon receiving the decision, stating the basis of the appeal. Appeal documents are to be submitted within four (4) weeks after the above notice of appeal.

The Appeals Board shall consist of the President of MEngC, EEAC Chairman and Corresponding Rector of IHL or their nominated representatives. The President of MEngC or the nominated representative shall be the Chairman of the Appeals Board.

If necessary, the Appeals 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 IHLs.

The decision of the Appeals Board shall be forwarded to the IHLs within three (3) months from the receipt of the complete documents. The decision of the Appeals Board shall be final.

Only not-to-accredit actions may be appealed. A notice of appeal must be submitted in writing by the Rector of the Universities/Institutions to the Registrar of MEngC within 2 weeks of receiving notification of the not-to-accredit action. This submission must include the reasons why the not-to-accredit decision of the responsible accreditation committee is inappropriate because of either errors of fact or failure of the respective accreditation committee to conform to MEngC's published criteria, policies, or procedures.

Upon receipt of a notice of appeal, the President of MEngC will notify the MEngC Board of the appeal and will select three or more members or past members of the MEngC, Executives Committee (EC) to serve as an appeal committee. Current members of the MEngC staff are ineligible to serve on the appeal committee. At least one member of this committee will be experienced as a program evaluator and/or former member of the appropriate committee. At least one member of this committee shall represent the Member Society with curricular responsibility for each of the programs (for example; ex-member of universities/institutions) for which there is an appeal. The President of MEngC will designate one of the committee members as chair of the committee.

The appeal committee will be provided with copies of all documentation that has been made available to the University/institution during the different phases of the accreditation cycle, including the institution's due process response and other materials submitted by the institution.

The institution is required to submit a response (normally one page) to the committee's executive summary previously sent to the institution. The institution may also submit other material it deems necessary to support its appeal. However, such materials must be

confined to the status of the program at the time of accreditation action of the committee and to information that was then available to the committee.

It is emphasized that improvements made to program subsequent to the annual meeting of the committee will not be considered by the appeal committee.

The respective committee, through its executive committee, may submit written materials beyond the statement to the institution and the executive summary for clarification of its position. Such materials must be provided to the institution and appeal committee at least 30 days prior to the date of the committee's meeting. Any rebuttal by the institution must be submitted to the committee at least 30 days prior to the committee meeting.

The appeal committee will meet and, on behalf of the MEngC Executives Committee (EC), consider only the written materials submitted by the institution and the respective committee in arriving at its determination. Representatives from the institution and the committee may not attend this meeting. The appeal committee's decision is limited to the options available to the committee responsible for the not-to-accredit determination. The appeal committee's findings and its decision will be reported to the MEngC Executives Committee (EC) in writing by the appeal committee chair. The decision rendered by the appeal committee is the final decision of MEngC.

The institution and the Committee will be notified in writing of this decision, and the basis for the decision, by the Executive Director within 15 days of the final decision.

5.11 Confidentiality

Documents or other information obtained by the Evaluation Teams, Evaluators, EEAC staff, and EEAC members in connection with the accreditation exercise shall be treated as confidential.

5.12 Expenses

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

5.13 Conflict of Interest

Members of the EEAC, Evaluation Team, Evaluators, Appeals Board and EEAC staff are expected to be constantly aware of any conflict of interest. Members shall declare their interest or withdraw from any situation or activity that may constitute a conflict of interest.

A record of known conflicts of interest will be maintained for every individual involved in the accreditation process. Each individual will be provided the opportunity to update this record annually. The records of conflicts of interest will be utilized in selection of team chairs and program evaluators.

Each individual representing MEngC must sign a conflict of interest and confidentiality statement indicating that she/he has read and understands MEngC policies on conflict of interest and confidentiality. The policies on conflict of interest and confidentiality will be presented and discussed at the start of each committee meeting. Individuals must refuse themselves from any portion of a MEngC meeting involving discussions or decisions for which they have a real or perceived conflict of interest. MEngC will maintain a record of the names of individuals refusing themselves for conflicts of interest at each meeting related to accreditation decision making.

6.0 Accreditation Procedure

This section describes EEAC's accreditation procedures from the process of application to the notification of accreditation results.

6.1 Application for Accreditation

The following gives the various types of programmes accreditation, and the deadlines for applications:

a) New programme (first-cycle) accreditation: at least six (6) months before the final examination of the first intake of students.

b) New-cycle accreditation of accredited programme: at least six (6) months before the expiry date of the accreditation.

c) Interim or continuing accreditation: at least six (6) months before the expiry date of the accreditation or interim period.

d) Deferred accreditation: latest one (1) year after deferment decision.

e) Declined accreditation. Not less than one (1) year after declined decision.

The EEAC upon receiving the application by the IHLs will decide on the dates of the accreditation visit. Once the visit dates have been fixed, the programme is given three (3) months deadline prior to the visit to submit the necessary accreditation documentations as specified in Section 8 of this Manual.

The application will be deemed to have been withdrawn, if the documents are not submitted latest three (3) months before the set dates for the visit.

The cut-off period for submission of application for programme accreditation by IHLs is twelve (12) months beyond the year of graduation for any cohort, if the graduates are to be included in the accreditation decision.

Failing to abide with the deadlines may result in delay or rejection of graduates' registration with MEngC.

6.2 Appointment of Evaluation Team

On submission of all required documents, an Evaluation Team shall be appointed as per Appendix A of this Manual. Members of the Evaluation Team are selected based on their expertise and standing in the particular discipline. The Evaluation Team appointed shall consist of representatives from both industry and academia so as to provide balanced perspective and experience to the assessment of a programme.

The Evaluation Team needs to be aware of EEAC policies and accreditation criteria as outlined in this Manaul. The Evaluation Team will assess the programme based on the accreditation criteria set forth in this Manual. The assessment includes the auditing and confirmation of documents submitted by the IHLs.

6.3 Scheduling of a Visit

A visit is arranged and coordinated by the EEAC on an appropriate date suitable to both the Evaluation Team and the IHLs. The visit should be held not later than three (3) months after the receipt of the IHLs documents by the Evaluation Team. It is important that as far as possible, the agreed dates of visit are adhered to.

6.4 Pre-Accreditation Visit Meetings

The Evaluation Team for a programme should meet at least **once** (either virtual or physical) upon receiving the accreditation documents, and again on the evening of Day 0 before the actual accreditation visit in order to study and discuss documents, and systematically identify and agree on any shortcomings prior to the visit. The Evaluation Team should strategically plan and/or put in request for supplementary input or Request for Information (RFI) or Request for Clarification (RFC) from the IHLs to fill the gaps before the visit. This request for further information required should be communicated to the IHLs through the EEAC.

6.5 Accreditation Visit

The accreditation visit will normally be scheduled for a period of two (2) days for new programme/new cycle/revisit (in deferment case), or one (1) day for continuing/interim visit. The overall conduct of the visit shall be managed by the EEAC. The visit shall normally include but not limited to the following:

(a) Opening meeting with the IHLs Management.

(b) Meeting with staff members.

(c) Meeting with students.

(d) Meeting with external stakeholders such as alumni, employers, and industry advisors.

(e) Visiting and checking of facilities.

(f) Checking relevant documents.

(g) Exit meeting with IHLs Management.

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

6.6 Report and Recommendation

The report from the Evaluation Team r shall be submitted to the EEAC within four (4) weeks after the visit.

7.0 Qualifying Requirements and Accreditation Criteria

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

Criterion 1 - Programme Educational Objectives (PEOs)
Criterion 2 - Graduate Attributes (GAs)
Criterion 3 - Academic Curriculum
Criterion 4 - Students
Criterion 5 - Academic and Support Staff
Criterion 6 - Facilities
Criterion 7 - Quality Management Systems

The assessment process will involve two 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 of the qualifying requirements will disqualify the programme from further assessment.**

There are eight components of the qualifying requirements and each programme is expected to have all the components. These components are:

1. Outcome-based Education (OBE) implementation.
2. A minimum of 135 SLT credits* of which 90 SLT credits* must be engineering courses offered over a period of four (4) years.
3. Integrated design project (IDP).
4. Final year project (minimum six (6) credits).
5. Industrial training (minimum of eight (8) weeks).
6. Full-time academic staff (minimum of eight (8)) with at least three (3) Professional Engineers registered with the MEngC or equivalent.
7. Staff: student ratio 1: 20 or better.
8. External examiner/advisor report. (one in every two academic years)

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.

7.1 Criterion 1: Programme Educational Objectives

Programme Educational Objectives (PEOs) are specific statements/goals consistent with the mission and vision of the IHLs, are responsive to the expressed interest of programme stakeholders, and describe the expected achievements of graduates in their career and professional life a few (3 to 5) years after graduation. The PEOs must be considered in the design and review of the curriculum in a top-down approach.

The programme shall publish and appropriately review the PEOs at the determined time, and ensure the PEOs are linked to the GAs and considered for the curriculum delivery.

7.2 Criterion 2: Graduate Attributes (GAs)

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

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

(i) **Engineering Knowledge** - Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialisation as specified in WK1 to WK4 respectively to the solution of complex engineering problems;

(ii) **Problem Analysis** - Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences (WK1 to WK4);

(iii) **Design/Development of Solutions** - Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations (WK5);

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

(v) **Modern Tool Usage** - Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations (WK6);

(vi) **The Engineer and Society** - Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems (WK7);

(vii) **Environment and Sustainability** - Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts. (WK7);

(viii) **Ethics** - Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice (WK7);

(ix) **Individual and Team Work** - Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings;

(x) **Communication** - Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;

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

(xii) **Life Long Learning** - Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

The range of **complex problem solving** and **complex engineering activities** are given in Appendix B – Section (d) Definition of Complex Problem Solving; Section (e) Definition of Complex Engineering Activities; and Section (f) lists the Knowledge Profile (WK).

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

(i) **Graduates Attributes (GAs)**: The IHLs shall have published GAs that have been formulated considering items (i) to (xii) given above, and any added outcome that can contribute to the achievement of its stated PEOs.

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

(iii) **Stakeholders' Involvement**: The IHLs shall provide evidence of stakeholders' involvement with regard to (i) and (ii) above.

7.3 Criterion 3: Academic Curriculum

The academic curriculum and curricular 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 GAs.

A balanced curriculum shall include all technical and non-technical attributes listed in the GAs, and there shall be a balance between the essential elements forming the core of the programme and additional specialist or optional studies (electives). The curriculum shall integrate theory with practice through adequate exposure to laboratory work and professional engineering practice.

Guidelines on academic programmes outlined in this Manual provide essential elements and features, which when combined will render a programme acceptable for accreditation by the EEAC.

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

Other contributing components to the curriculum such as a variety of teaching-learning (delivery) modes, assessment and evaluation methods shall be designed, planned and incorporated within the curriculum to enable students to effectively develop the range of

intellectual and practical skills, as well as positive attitudes that are constructively aligned with the PEOs and GAs. The assessment to evaluate the degree of the achievement of the GAs of the programme shall be done and its level of attainment recorded. The assessment of GAs and the Course Outcomes (COs) by the students may also be done both at the programme as well as at course levels, respectively. The teaching-learning methods shall enable students to take full responsibility for their own learning and prepare them for life-long learning. The programme shall demonstrate the relationship between the courses and the GAs.

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

The emphasis on particular elements or features of the programme must remain flexible, but it will be required in the accreditation process to confirm that minimum levels of understanding and standards of achievement are attained in the basic courses relevant to the fields of engineering.

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

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

(ii) The **remaining SLT credits** shall include sufficient content of **general education component** (such as 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 memorisation of details and facts. The curriculum shall also provide students with ample opportunities for analytical, critical, constructive, and creative thinking, and evidence-based decision making in dealing with complex engineering problems. The curriculum shall include sufficient elements for training students in rational thinking and research methods.

Typical core contents for selected traditional engineering disciplines are shown in Appendix B of this Manaul. The curriculum shall encompass the **complex problem solving, complex engineering activities** and **knowledge profile,** as summarised in Sections (d), (e), and (f) in the same Appendix.

SLT Credit

The SLT credit is based on the Student Learning Time (SLT). The SLT defines that for every one credit specified, students need to spend 40 hours of learning. This was determined by considering the total amount of time available in a week, the time needed for personal matters, the time for rest and recreational activities, and the time for studying. For a course of three (3) SLT credit, students will have to spend 120 hours, which involves both face-to-face meetings (lectures/laboratory work/tutorials, etc.) and non-face-to-face activities. The programme shall calculate the SLT credit based on the amount of time students spend in the lecture, tutorial, laboratory sessions, project work, problem-based learning, e-learning modules, discovery learning, and coursework projects and independent study accordingly.

For industrial training, the following guideline shall be followed:

- Industrial training shall be for a minimum of eight (8) weeks of continuous training. It can be fulfilled in two (2) approaches: the conventional and/or Work Based Learning (WBL).

  For the conventional Industrial Training, one (1) credit is allocated for every two (2) weeks of training subjected to a maximum of six (6) credits. The training shall be adequately structured, supervised and recorded in log books/report.

  The credit allocated for WBL components shall be in accordance with the relevant guidelines given below.

The industrial training must be conducted before the final semester.

For final year project, the following guideline shall be followed:

- A final year project is subjected to a minimum of six (6) credits and a maximum of twelve (12) credits.

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

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

- Effective Learning Time (ELT):
  (i) Theory (Dependent Learning (DL) and Independent Learning (IL))
  (ii) Industrial Guidance (IG)
  (iii) Assessment (during work and outside work

ELT = (Theory + Industrial Guidance + Assessment) x 80%
= (DL + IL + IG + Assessment) x 80%

Credits = Effective Learning Time (ELT) / 40 Malaysian Notional Hour
= ELT / 40

Notes:

➢ **Tutorial**

Tutorial can be part of the programme so as to complement the lectures. A tutorial session should preferably not exceed 30 students at any one time.

- **Laboratory Work**

Students should receive sufficient laboratory work to complement engineering theory that is learnt through lectures. The laboratory should help students develop competence in executing experimental work. Students should work in groups, preferably not more than five (5) in a group. It is expected that a significant number of laboratory works shall be open-ended with clear COs and GAs.

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

- **Industrial Training**

Exposure to professional engineering practice is a key element in differentiating an engineering degree from an applied science degree.

Familiarity with all common engineering processes is essential and exposure at a practical level to a wide variety of processes is required at a level appropriate to the young professional. Whilst it is clearly desirable for students to get a feel of the skills involved, the central aim of the Industrial Training is to achieve appreciation and/or capability of carrying out complex engineering activities but not 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. It is considered that there is no real substitute for first-hand experience in an engineering-practice environment, other than exposure to the industrial environment outside the IHLs.

There should be a structured industrial training and supervision by qualified personnel. Industrial training is a key component of learning in an integrated academic curriculum. Due to its importance, the programme shall have a minimum of eight (8) weeks of continuous industrial training for each student.

- **Work Based Learning (WBL)**

WBL is an educational strategy that provides students with real-life work experiences. It is one of the industrial training approaches that provides students with authentic context for learning in an engineering environment. It is essential that the engineering

environment fulfils the learning outcomes of the programme. The design of WBL integrates theory and industrial practices in the workplace.

WBL is an alternative teaching and learning approach which can replace conventional delivery in campus.

- **Exposure to Engineering Practice**

Exposure to engineering practice shall also be integrated throughout the curriculum as it is a key component. In addition, exposure to professional engineering practice may also be obtained through a combination of the following:

(i) Lectures/talks by guest lecturers from industry.

(ii) Academic staff with industrial experience.

(iii) Courses on professional ethics and code of conduct.

(iv) Industry visits.

(v) Industry-based project.

(vi) Regular use of a logbook in which industrial experiences are recorded.

- **Final-Year Project**

The final-year project should preferably be industry related, and can provide one of the best means of introducing an investigative research-oriented approach to engineering studies. It is a requirement of the programme to include a significant project in its later stages. The final-year project is required to seek individual analysis and judgement, capable of being assessed independently. The student among others is expected to develop techniques in literature review and information processing, as necessary with all research approaches.

It is recommended that final-year projects should also provide opportunities to utilise appropriate modern technology in some aspects of the work, emphasising the need for engineers to make use of computers and multimedia technology in everyday practice.

- **Integrated Design Projects**

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

  The IDPs are multifaceted assignment that serves as a culminating academic and intellectual experience for students, typically towards the end of an academic programme or learning-pathway experience.

  The IDP should involve students working in group. The programme should seize the opportunity to deliver and assess many relevant GAs through the Integrated project.

- **Condition for Passing Courses**

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

7.4 Criterion 4: Students

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

Students intending to pursue engineering programmes shall have a good understanding of mathematics and physical sciences. The normal entry qualification is Matriculation Exam (with good principal passes in mathematics and physical sciences) or its equivalent.

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

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

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

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

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

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

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

7.5 Criterion 5: Academic and Support staff

A viable engineering programme is expected to have a minimum of 8 full-time academic staff relevant to the particular engineering discipline. All academic staff teaching engineering subjects **must** be registered with MEngC. Every programme shall have a minimum of three (3) full-time Professional Engineers registered with the MEngC and actively teach in the programme. For programmes with a total student enrolment exceeding 160, at least 30 percent of the actively teaching engineering academic staff shall be registered with the MEngC as Professional Engineers.

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

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

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

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, IHLs 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.

7.6 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 learning outcomes.

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.

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

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

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.

7.7 Criterion 7: Quality Management Systems

The IHLs and the faculty must ensure that there exists a quality management system to oversee and monitor the overall achievement of the PEOs and GAs. These include the controlling, managing, directing, organising and supervising of the overall management system of the IHLs. It must have adequate arrangements for planning, development, delivery and review of engineering programmes together with the academic and professional development of its staff.

7.7.1 Institutional Support, Operating Environment, and Financial Resources

The IHLs must regard quality engineering education as a significant and long-term component of its activity. This would most commonly be reflected in the IHL's vision and mission statements and strategic plans. In addition, institutional support may be reflected in the constructive 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 IHLs through the appointment of highly qualified and experienced senior staff in sufficient numbers.

The development of academic staff, in particular, through opportunities for further education, industrial exposure, as well as research and development, is of utmost importance for the sustainability and quality improvement of the programme. Opportunities for the development of support staff should also be provided. The IHLs shall provide sound policies, adequate funding and infrastructure for this purpose.

Financial resources must be adequate to assure the overall quality and continuity of the engineering programme. The IHLs must have sufficient financial resources to acquire, maintain, and operate facilities and equipment appropriate for the engineering programme.

7.7.2 Programme Quality Management and Planning

The IHL's processes for programme planning, curriculum development, and regular curriculum and content review must involve all academic staff. The processes include reviewing PEOs and GAs, tracking the contributions of individual Course Outcomes (COs) to the GAs, tracking performance assessment processes, reviewing the comments from External Examiner/Advisor, reviewing feedback and inputs from stakeholders. The process of continual quality improvement shall be implemented with full accountability.

The IHLs must demonstrate appropriate benchmarking is carried out with similar accredited/recognised programme (s) offered at other IHLs.

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

Programme (s) via various modes and at different locations, such as, full-time, franchised, twinning, part-time, distance learning, joint degree and multi campus may be conducted. The IHLs awarding the degree shall be responsible for ensuring the quality and management of these programmes.

7.7.3 External Assessment and Advisory System

The IHLs shall have an external examiner for each programme to independently review the overall academic standard. Appendix D provides a guideline for the content of the report.

The external examiner is a person of high academic standing in the engineering discipline. 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. Evaluation is to be made at least once in every two (2) years.

The IHLs shall have an industry advisory panel for participation by practising engineers, alumni and employers of engineers for the purpose of planning and continuous improvement of programme quality. The advisory body should be specific for the programme, so that the IAP can provide input specific to the programme. The number of IAP members should be appropriate so that the IAP can bring about improvement to the programme. These industry advisors shall be expected to provide inputs and

recommendation on an on-going basis through participation in discussion and forums. The IHL should leverage on the IAP for teaching and learning activities.

The external examiner **report** and feedback from industry advisors shall be used for continual quality improvement.

7.7.4 Quality Assurance

A quality management system must be in place to assure the achievement of Graduate Attributes. The IHLs 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:

(a) Student admission including credit and course transfer/exemption.

(b) Teaching and learning.

(c) Assessment and evaluation which include:

- examination regulations and criteria for pass/fail
- preparation and moderation processes
- level of assessment
- assessment processes including final year project/industrial training.

7.7.5 Safety, Health and Environment

The IHLs shall demonstrate that it has in place, a system for managing and implementation of safety, health and environment. Safety culture is of utmost importance, and among a major factor affecting accreditation decision. The IHLs shall demonstrate activities to inculcate safety culture among the staff and students and comply with any or all applicable rules or regulations pertaining to safety, health and environment.

8.0 Accreditation Documents

8.1 New Programme (First-cycle) or New-cycle Accreditation or Approval of New Programme

The IHLs applying or reapplying (in deferment case) for accreditation of new programme (first-cycle) or new-cycle accreditation, or approval of new programme, must submit documents that provide accurate information and sufficient evidence for the purpose of evaluation. 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, unless otherwise stated, the IHLs shall submit through the Accreditation Management System (AMS) the following documents:

(i) A completed Self-Assessment Report (SAR) (as noted in Section 8.3)

(ii) Supporting and other relevant Documents (as noted in Section 8.4)

(iii) A completed Appendix C (Checklist of Documents for Accreditation/Approval of New Programme and Relevant Information).

Institutional Documents and Additional Documentation (as noted in Section 8.5) are to be made available during the visit.

8.2 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 IHLs shall submit through the Accreditation Management System (AMS) the following documents:

(i) The earlier SAR prepared for previous accreditation visit (as noted in Section 8.3)

(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 EEAC (if any).
- Updates on any changes in information, data, statistics, status, policies, etc., and report on Continual Quality Improvement (CQI) activities related to the seven (7) accreditation criteria. These may involve for example change of programme name, PEO or GA statements, OBE model, academic curriculum (structure or content), students' entry requirements, number of academic or support staff, number of academic staff with professional qualifications, staff student ratio, facilities, QMS.
- Report on action taken to address issues listed under Opportunity for Improvement (OFI) in the previous accreditation visit with CQI being put into practice, where appropriate.
- Any other related matters to be highlighted in any section/criteria.

(iii) Supporting and other relevant Documents – Digital format.

Institutional Documents and Additional Documentation (as noted in Section 8.5) are to be made available during the visit.

8.3 Self-Assessment Report

A Self-Assessment Report (SAR) is an account of the IHL's plan, implementation, assessment and evaluation of the programme conducted. It reflects the processes with results obtained used in continual quality improvement at all levels of the programme's activities. This document, ranging between 50 – 100 pages with all pages numbered and a table of contents, shall provide the self-evaluation of the outcomes and subsequent corrective actions including the information and description about the programme to enable the Evaluation Team to objectively assess the programme for accreditation or approval. The emphasis shall be on qualitative description of each aspect and criterion, and how these meet the standards and expectation as set out in this Manual. In other

words, this summary document is a form of self-assessment of the IHL's programme outcomes attainment.

The general structure of the SAR shall follow the guidelines as described in, but not limited to, **Sections 8.3.1 to 8.3.9** in conjunction with Appendix C of this Manual. Appendix F provides sample formats for presenting some required information.

The submission must be comprehensive, readable, self-contained and provide a coherent overview with the text addressing each major point in a definitive manner. It must be concise with sufficient depth and detail in conjunction with the supporting information to appropriately represent the programme. It will not be sufficient to merely provide a collection of disparate items, or point to a web site, and requiring the EEAC to find the relevant information. The IHLs is advised to provide accurate information as required by this Accreditation Manual, for verification by the Evaluation Team during the visit.

8.3.1 General Information and Programme Accreditation History

(i) Provide general information on the IHLs and the specific programme.

(ii) Provide detailed information on programme history of accreditation (year of accreditation, conditions imposed and actions taken).

(iii) Describe any self-initiated changes made to the programme and state the year the changes were introduced.

8.3.2 Programme Educational Objectives (PEOs)

(i) State the vision and mission of the IHLs and/or faculty.

(ii) List the PEOs and state where they are published or publicised.

(iii) Describe how the PEOs are consistent with the vision and mission of the IHLs and/or faculty and stakeholders' requirements.

(iv) Describe the definition or PEO elements/performance indicators, achievement criteria, and performance targets.

(v) Describe the PEOs development and assessment processes including but not limited to:

- Performance indicators

- The assessment instruments
- Their achievements
- CQI activities
- Stakeholders involvement

*Satisfactory/Unsatisfactory

8.3.3 Graduate Attributes (GAs)

(i) List down the GAs and state where are they published or publicised.

(ii) Describe how the GAs relate to the PEOs.

(iii) Describe how the GAs are developed; how they encompass and are consistent with the 12 EEAC's GAs of Section 7.2 and the PEOs.

(iv) Describe the GA assessment model adopted by indicating

- Where each of the GA is assessed?
- How each of the GA is assessed?
- What is the satisfactory attainment and measures to overcome any shortcomings?

(v) Describe CQI strategies implemented in relation to GAs.

(vi) Self-assess on programme performance related to GAs based on the following scale (with justifications):

*Satisfactory/Unsatisfactory

8.3.4 Academic Curriculum

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

(ii) Describe the programme delivery and assessment (include description of assessment rubrics for projects, case studies, etc. and non-cognitive GAs) methods, 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 GAs.

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

- A matrix linking courses to GAs to identify and track the contribution of each course to the GAs. IHLs may adopt the sample overall 'Courses to GAs' mapping matrix included in Appendix F of this Manual to identify and track the contribution of the courses to the GAs as a guiding template. IHLs may adopt own mapping strategy that may be different from the sample template.
- Distribution of the engineering courses according to areas specific to each programme referring to underpinning Engineering Sciences, Principles, and Applications for traditional courses (Civil, Mechanical, Electrical, Chemical and Electronics) of Appendix B and areas obtained from benchmarking exercises with established programme elsewhere for non-conventional programmes.
- Mapping of the courses to the Knowledge Profile in Appendix B.
- Distribution of the related non-engineering (general education) courses.
- Distribution of the courses offered according to semester.

(**Note**: Samples of table formats are available in Appendix F).

(iv) Describe how benchmarking report/s and other feedback (from EEAC, IAP, External Examiner, etc.) have resulted in Academic Curriculum improvement.

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

(vi) Describe laboratory exercises, related GAs, and approach to deliver and assess. Give examples of open-ended laboratory activities.

(vii) Describe industrial training scheme and relate it to GAs using appropriate examples.

(viii) Describe exposure to professional practice and relate it to GAs. Cite examples of exposure to professional practice activities.

(ix) Describe Final Year Projects (FYPs), related GAs, and how FYPs fulfil the specific requirements stipulated in the Manual.

(x) Describe Integrated Design Projects, related GAs, and how the projects fulfil the specific requirements stipulated in the Manual.

(xi) Describe the 'Condition for Passing Courses' practice(s).

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

(xiii) Describe CQI strategies to be implemented in relation to Academic Curriculum.

(xiv) Self-assess on programme performance related to Academic Curriculum based on the following scale (with justifications):

*Poor/Satisfactory/Good

8.3.5 Students

(i) Describe the requirements and process for admission of students to the programme.

(ii) Describe the policies and processes for credit and course transfer/exemption.

(iii) Describe students' counselling services available.

(iv) Describe formal or informal feedback platform/channel to obtain students feedback and suggestions for further programme improvement, and how have the feedback resulted in programme improvement.

(v) Describe students' workload.

(vi) Describe students' activities and involvement in student organisations and relevant professional engineering bodies that provide experience in management and governance, representation in education and related matters and social activities.

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

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

(vii) Discuss students' performances in relation to GAs from overall holistic perspective involving both curricular and co-curricular activities, such as participating in design competitions, public speaking activities, etc.

(viii) Describe CQI strategies to be implemented in relation to Students.

(ix) Self-assess on programme performance related to Students based on the following scale (with justifications):

*Poor/Satisfactory/Good

8.3.6 Academic and Support Staff

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

(ii) Discuss how the overall staff workload enables effective teaching, student-staff interaction, student advising and counselling, IHLs service and research activities, professional development and interaction with industry.

(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 academic staff (full-time, part-time and inter-programme) by year for the past four years (Table 8 in Appendix F).
- An analysis of all academic staff (Table 9 in Appendix F).
- A summary of the academic qualifications of academic staff (Table 10 in Appendix F).
- A summary of the professional qualifications and membership in professional bodies/societies of academic staff (Table 11 in Appendix F). This shall also include registration with Board of Engineers Malaysia in line with the requirement.
- A summary of the posts held by full time academic staff (Table 12 in Appendix F).

- A summary of teaching workload of academic staff for the current semester (Table 13 in Appendix F).
- An analysis of all support staff (Table 14 in Appendix F).
- A summary of the posts held by support staff (Table 15 in Appendix F).
- The staff: student ratio by year for all academic years for the past four years (Table 16 in Appendix F).
- A listing of lecturers/invited speakers from industry/public bodies and their level of involvement.

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

(v) Describe participation of academic staff in consultancy activities.

(vi) Describe participation of academic staff in research and development activities.

(vii) Describe CQI strategies to be implemented in relation to Academic and Support Staff.

(viii) Self-assess on programme performance related to Academic and Support Staff based on the following scale (with justifications):

*Poor/Satisfactory/Good

8.3.7 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 equivalent to those provided for on-campus students.

(iii) Describe the adequacy of 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 in the supporting documents but is not limited to the following:

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

(iv) Describe procedures and monitoring of health, safety and environmental aspects of facilities including lecture halls, laboratories, equipment, etc.

(v) Describe maintenance and calibration aspects of teaching facilities and equipment/apparatus.

(vi) Discuss how the safety, health and environment issues being managed by the IHLs.

(vii) Describe CQI strategies to be implemented in relation to Facilities.

(viii) Self-assess on programme performance related to Facilities based on the following scale (with justifications):

*Satisfactory/Unsatisfactory

8.3.8 Quality Management Systems

(i) Describe the Quality Management Systems and organisational structure of the IHLs as well as the structure within the faculty/department/ programme. Discuss the commitment and 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 the PEOs and GAs and assure continuity/sustainability of the programme. All relevant policies are to be made available during the visit.

(ii) Discuss the mechanism for the following: programme planning; curriculum development; curriculum and content review; responding to feedback and inputs from all stakeholders monitoring the contribution of individual courses to the GAs; monitoring outcomes of performance through assessment; responding to External Examiners comments; reviewing of PEOs and GAs; and Continual Quality Improvement (CQI). Where these are discussed elsewhere in the report, specify their locations. For a new programme, the IHLs also needs to discuss the processes surrounding the decision to introduce the programme.

(iii) Summarise feedback obtained from External Examiner/Advisor, IAP and stakeholders and how CQI was carried out.

(iv) Summarise benchmarking reports and how CQI was carried out.

(v) Describe how the Quality Management System (QMS) of the IHLs 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 GAs.
- 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 IHLs, and whether those systems are implemented.

(vi) Describe the management system for safety, health and environment.

(vii) Describe CQI strategies to be implemented in relation to QMS.

(viii) Self-assess on programme performance related to Quality Management Systems (QMS) based on the following scale (with justifications):

*Satisfactory/Unsatisfactory

8.3.9 Other Relevant Information

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

8.4 Supporting Material Document – Digital Format

The supporting documents are evidence to substantiate claims made in the SAR by IHLs. These documents are to be submitted in digital format as Appendices to the SAR as follows:

8.4.1 General Information and Programme Accreditation History

(i) Provide official publications relating to the Faculty/ School/ Department/ Programme, undergraduate prospectus and other information accessible through website.

(ii) Provide programme's previous accreditation history, reports, relevant letters, and other relevant documents.

8.4.2 Programme Educational Objectives (PEOs)

(i) Provide documented evidences of publication of vision and mission statements.

(ii) Provide documented evidences of publication or dissemination of PEO statements.

(iii) Provide documented evidences of publication or dissemination of definition or PEO elements/performance indicators, achievement criteria, and performance targets.

(iv) Provide sample responded questionnaires/survey forms and/or other tools used to establish/formulate/define PEO elements/performance indicators, and review the PEOs.

(v) Provide sample responded questionnaires/survey forms and/or other tools used to evaluate achievement of the PEOs.

(vi) Provide documented evidences of how the processes and results obtained from the processes resulted in the CQI of the programme.

(vii) 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 PEOs, and the involvement of various internal and external stakeholders in these processes to support claims made in this section.

8.4.3 Graduates Attributes (GAs)

(i) Provide documented evidences of publication or dissemination of GA statements.

(ii) Provide documented evidences of publication or dissemination of definition of GA elements/performance indicators.

(iii) Provide sample responded questionnaires/survey forms and/or other tools used to establish/formulate/define GA elements/performance indicators, and review of the GAs.

(iv) Provide documented evidences of publication or dissemination of the OBE model adopted to deliver, assess and evaluate achievement of the GAs.

(v) Provide 'GA box/tray' for each GA, to cover from mapping of courses to the selected GAs, until the results of the GA achievements (based the adopted model), and CQI process.

(vi) Provide documented evidences of OBE management system (computer software etc.).

(vii) 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 GAs, and the involvement of various internal and external stakeholders in these processes to support claims made in this section.

8.4.4 Academic Curriculum

(i) Provide documented evidences of publication or dissemination of overall 'Courses to GAs' mapping matrix.

(ii) Provide documented evidences of publication or dissemination of the elaboration/definition of CPS, CEA and Knowledge Profile.

(iii) Provide list of titles of experiments in the laboratory and documented evidences showing open-ended laboratory activities.

(iv) Provide list of companies that offered industrial training for students.

(v) Provide list of exposure to professional practice activities and describe the level of student's engagement.

(vi) Provide list of final-year project titles.

(vii) Provide Integrated Design project's synopsis and list of titles.

(viii) Provide documented evidences showing programme implementation of the 'Condition for Passing Courses'.

(ix) 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.

8.4.5 Students

(i) Provide documented evidences showing the students admission requirements to the programme.

(ii) Provide documented evidences showing the policies and processes for credit transfer/exemption.

(iii) Provide documented evidences showing available students' counselling services.

(iv) Provide documented evidences showing formal or informal feedback platform/channel to obtain students feedback and suggestions for further programme improvement.

(v) Provide 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.

(vi) Provide documented evidences showing students' performance in relation to GA from an overall holistic perspective, from both curricular and co-curricular activities, such as participating in design competition, public speaking activities, etc.

8.4.6 Academic and Support Staff

(i) Provide 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.

(ii) Provide documented evidences showing participation of academic staff in professional training and qualifications, and programme's projection/plan on professional training schemes for academic staff.

(iii) Provide documented evidences showing participation of academic staff in consultancy activities.

(iv) Provide documented evidences showing participation of academic staff in research and development activities.

8.4.7 Facilities

(i) Provide a list of all equipment and software used by the programme including recent additions and planned additions, as well as the titles of books, and journals for the programme.

(ii) Provide documented evidences of procedures and monitoring of health, safety and environmental aspects of facilities including lecture halls, laboratories, equipment, etc.

(iii) Provide documented evidences of maintenance and calibration of facilities and equipment/apparatus in the laboratories or elsewhere.

8.4.8 Quality Management System (QMS)

Provide documented evidences of:

(i) QMS and organisational structure.

(ii) Available policies.

(iii) Standard Operating Procedures (SOP), or ISO or other certifications.

(iv) Relevant files (including course files) and documentations.

(v) Relevant minutes of meeting related to QMS, such as from IAP's meetings, Quality Committee meeting, etc.

(vi) Management system for safety, health and environment.

(vii) Letters of appointment of IAP, External Examiner(s), and committee members, etc.

(viii) External Examiner/Advisor reports.

(ix) Benchmarking report/s.

(x) Responses to close the loop of feedback from stakeholders.

8.5 Institutional Documents and Additional Documentation to be Made Available during the Visit – Hard Copy.

The Institutional Documents and Additional Documentation shall be made available during the visit in hardcopies or other tangible forms. They are to support the information/evidences requested in Sections 8.3 and 8.4 for verification purposes by the Evaluation Team.

These documents are either hardcopies of the supporting documents already provided by the IHLs during the SAR submission digital format, or additional documents to further support the supporting documents, or evidences not submitted with the SAR but to be viewed during the visit. These may include:

(i) The IHLs/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 sprospectus; 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) GA trays/boxes for each of the 12 EEAC's GAs.

(vii) OBE management software (if any).

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) Integrated design projects and assessment rubrics.

(xi) Moderation forms for examination papers and other continuous assessments.

(xii) Laboratory exercises to include experiment instruction sheets, as well as supporting information, and marked laboratory exercises.

(xiii) Laboratory reports.

(xiv) Documents related to industrial training (IT)/placement and students' IT 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 academic staff.

(xix) Documents related to academic staff attending training, conferences and workshops.

(xx) Documents related to support staff training.

(xxi) Documents related to staff industry linked consultancy activities.

(xxii) Documents related to staff industry linked research activities.

(xxiii) Documents related to staff promotion exercises.

(xxiv) Equipment calibration records.

(xxv) Facilities and equipment maintenance records.

(xxvi) Documents related to health, safety, and environment.

(xxvii) IHLs/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.

9.0 Approval Procedure for a New Engineering Programme

9.1 EEAC's Initial Evaluation

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

(i) Application for Approval to Conduct a New Degree Programme

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

The IHLs should submit the complete set of documents (refer to Section 8 and Appendix C) to the EEAC (refer to Appendix E for process) for initial evaluation by the EEAC. The recommendation from the EEAC will be forwarded to the relevant authorities.

When the documents are considered to be inadequate, the IHLs 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 IHLs no longer intends to conduct the programme.

(ii) Initial Evaluation

The EEAC C shall appoint an Evaluator to evaluate the proposed programme. The evaluation shall cover the following areas:

a) general awareness of current development in engineering education and engineering practice;
b) the stated Programme Educational Objectives and Programme Outcomes;
c) the course content;
d) the quality of staff, the educational culture;
e) the teaching facilities;
f) the library/resource centre;
g) the IHL's quality systems and processes;
h) the assessment procedure and examination rules; and
i) other related activities.

The evaluation may be conducted desktop, or may be discussed in meeting/s between the Evaluator and the IHLs, or may include a visit to the IHLs by the Evaluator.

9.2 Report and Recommendation

The report from the Evaluator shall be submitted to EEAC within four (4) weeks after the appointment/visit.

9.3 EEAC's Decision

Based on the evaluation, EEAC may decide on one of the following:

- To recommend approval of the programme to be conducted.
- To recommend conditional approval for the programme to be conducted with the provision that the IHLs takes certain actions to rectify all the shortcomings indicated in the report within a specified period as determined by EEAC.
- Not to recommend approval.

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

9.4 Provisional Accreditation

Approved programme will be accorded provisional accreditation by MEngC, EEAC.

LIST OF APPENDICES

Appendix A - Engineering Education Accreditation Committee (EEAC) , Evaluation Team, and Accreditation Appeals Board

Appendix B - Engineering Content for the Main Branches and Innovative Programmes

Appendix C - Checklist of Documents for Accreditation*/Approval of New Programme and Relevant Information

Appendix D - Process Flow Chart for Application of Accreditation and Approval of Engineering Programmes

Appendix E - Sample Table Templates for SAR

APPENDIX A

ENGINEERING EDUCATION ACCREDITATION COMMITTEE (EEAC)

EVALUATION TEAM AND ACCREDITATION APPEALS BOARD

1.0 ENGINEERING EDUCATION ACCREDITATION COMMITTEE (EEAC)

The Engineering Education Accreditation Committee (EEAC) was delegated by the M.Eng.C (Myanmar Engineering Council) to be the body for accreditation of engineering programmes. It is a non-governmental organisation and has the support of stakeholders in the engineering profession.

M.Eng.C has a duty to ensure that the quality of engineering education/ programme of its registered engineers attains the minimum standard comparable to global practice.

The Engineering Education Accreditation Committee (EEAC), representing MEngC shall be an independent body for the accreditation of engineering programmes.

The terms of reference of EEAC are:

(i) to implement the accreditation policy of the MEngC;

(ii) to formulate guidelines and procedures for accreditation;

(iii) to appoint an Evaluation Team to accredit each engineering programme;

(iv) to receive and review evaluation reports by the Evaluation Teams, and decide on whether accreditation should be granted, as well as the conditions to be imposed, if there is such a need;

(v) to respond to the Council of MEngC on complaints and appeals regarding the accreditation process;

(vi) to represent MEngC in mutual recognition agreements on academic qualifications and professional membership with other countries;

(vii) to report periodically to the MEngC on its work

2.0 EVALUATION FOR APPROVAL TO CONDUCT A NEW PROGRAMME

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

3.0 EVALUATION TEAM FOR ACCREDITATION

The Evaluation Team shall be appointed by EEAC and normally consists of:

(i) a Convener who shall be a Professional Engineer; and

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

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

4.0 EVALUATOR FOR APPROVAL TO CONDUCT A NEW PROGRAMME

An Evaluator shall be appointed preferably from amongst EEAC member from fields related to the programme being evaluated. In cases where an EEAC member is not available, appointment of Evaluator shall be made from amongst senior Evaluation Team member.

5.0 ACCREDITATION APPEALS BOARD

The Accreditation Appeals Board shall consist of the President of MEngC, EEAC Chairman and Corresponding Rector of IHL or their nominated representatives. The President of MEngC or his nominated representative shall be the Chairman of the Accreditation Appeals Board.

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

The decision of the Accreditation Appeals Board shall be final.

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APPENDIX B

ENGINEERING CONTENT FOR THE MAIN BRANCHES AND INNOVATIVE PROGRAMMES

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

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

CHEMICAL	CIVIL	COMPUTER ENGINEERING AND INFORMATION TECHNOLOGY	ELECTRICAL
Chemical Thermo-dynamics	Strength of Materials	Cryptography, and Information Protection	Circuits and Signals
Material and Energy Balance	Structural Analysis and Design	Communications, Wireless and Mobile Computing	Electromagnetic Fields and Waves
Chemical Kinetics and Reactor Design	Fluid Mechanics/ Hydraulics	Operating Systems	Instrumentation and Control
Momentum Transfer	Soil Mechanics/ Geotechnical Engineering	Distributed Systems	Digital and Analogue Electronics
Heat Transfer	Civil Engineering Materials	Computer Systems: Architecture, Parallel Processing, and Dependability	Machines and Drives
Mass Transfer	Statics and Dynamics	Embedded Systems	Power Electronics
Separation Process	Construction Engineering	Circuit And Systems	Electrical Power Generation and High Voltage Engineering
Process Design	Surveying	Computer Vision and Image Processing and Signal And Speech Processing	Communications System
Process Control and Instrumentation	Water Resources and Hydrology	IoT and Cloud Computing	Power System Analysis
Safety and Environmental Protection	Highway and Transportation	Software Engineering	Electronic Drives and Applications
Environmental Studies	Environmental Studies	Programming	Electrical Energy Utilisation
Plant, Equipment Design, and Economics			

ELECTRONICS	MECHANICAL	NAVAL ARCHITECTURE AND MARINE ENGINEERING	PETROLEUM
Circuits and Signals	Materials	Strength of Materials	Geology for Petroleum Engineers
Electromagnetic Fields and Waves	Statics and Dynamics	Statics and Dynamics	Strength of Materials
Instrumentation and Control	Fluid Mechanics	Fluid Mechanics Hydrodynamics	Chemical Engineering Thermodynamics
Digital and Analogue Electronics	Thermo- dynamics and Heat Transfer	Thermodynamics Heat Transfer	Fundamentals of Petroleum Engineering
Microprocessor Systems	Mechanical Design	Structural Design and Analysis	Reservoir Rock and Fluid Properties
Programming Techniques	Instrumentation and Control	Marine and Marine Engineering Design	Reservoir Engineering
Introduction to Electrical power System	Vibrations	Resistance and Propulsion	Well Drilling Equipment and Operations
Computer Architecture	Solid Mechanics	Ship and Machinery Production Technology	Production Engineering (Oil & Gas Facilities Operations inclusive)
Communications System	Manufacturing/ Production	Naval Architecture	Natural Gas Engineering (Gas Processing, Transportation, Operating Facilities such as LNG, CNG, etc. & Fiscal Metering inclusive)
Electronic System Analysis and Design	Electrical Power and Machines	Marine and offshore Engineering	Reservoir Characteristics & Simulation
Digital signal processing and application	Electronics and Micro-Processors	Computer Application in Marine Design	Well Technology
	Computer Aided Engineering	Marine Electrical Systems and Electronics	Petroleum Economics
			Petroleum Engineering Design
			Fundamentals of Enhanced Oil Recovery
			Environmental Technology and Safety in Petroleum Industry

(a)(ii) Engineering Applications

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

Chemical Engineering

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

Civil Engineering:

1. To appreciate the characteristics and structural behaviour of materials in a variety of user environments.
2. To be able to analyse and design structural components from these materials.
3. To appreciate the range of construction technology currently available and the skills which they require in people for their use.
4. To appreciate the cost aspects of material selection, construction methods, operation and maintenance in their interaction with design and the delivery of civil engineering facilities and services.

5. To understand the whole process of industrial decision-making in design, manufacturing and use and how it is influenced not only by technical ideas but also by the practical constraints of financial and human resources as well as the business and social environment of engineering.

Computer Engineering and Information Technology:

1. To be able to analyze a problem, to identify and define the requirements appropriate to its solution, to design, implement, and evaluate a solution to meet the requirements.
2. To be able to analyze and design the components of a computing system.
3. To be able to make sure computer systems developed methodically result in building the right components with quality built in from the beginning.
4. To build integrated environments for computing, communications, and information access and work advancements in telecommunication systems and networks including security issues.
5. To appreciate the quality and innovations using IoT and emerging technologies.

Electrical and Electronic Engineering:

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

the practical constraints of financial and human resources and by the business and social environment of engineering.

Mechanical Engineering:

1. To appreciate the characteristic behaviour of materials in a variety of user environments.

2. To appreciate the range of manufacturing systems and industry energy currently available and the skills which they require in people for their use.

3. To appreciate the cost aspects of material selection, manufacturing methods, operation and maintenance in their interaction with design and product marketing.

4. To understand the whole process of industrial decision-making in design, manufacturing and use and how it is influenced not only by technical ideas but also by the practical constraints of financial and human resources as well as the business and social environment of engineering.

Naval Architecture and Marine Engineering

A minimally competent Naval Architecture and Marine Engineer demonstrates sound engineering judgement in the application of science and engineering principles and practices to the design of vessels, marine craft, and offshore structures. The minimally component engineer shall:

1. Be knowledgeable of global and local ship structure, its arrangement, weight and load bearing capability, and its interrelation with the marine environment, giving due consideration to environmental degradation and external loads such as wind and waves.

2. Be knowledgeable concerning ship resistance and energy conversion, its application to ship propulsion, power plant selection and ship system design.

3. Be knowledgeable of the principles and practices of marine engineering including chemical, thermal, mechanical, environmental, pollution-prevention, and electrical systems, and component selection and integration.

4. Be knowledgeable of the principles and practices of hydrostatics, stability, and hydrodynamics.

5. Be knowledgeable of the effects of changes of ship form and parameters on dynamic response, seakeeping and controllability.

6. Be able to size, select, specify, and evaluate ship components and their materials of construction.

7. Be knowledgeable of the life-cycle economic effects of ship design characteristics, component selection and operations.

8. Be knowledgeable concerning constraints and practicability of shipbuilding, ship repair, and operational maintainability.

9. Be knowledgeable concerning fire fighting, structural fire protection, life saving, ship survivability, personnel safety and associated systems.

10. Be aware of and be able to apply applicable codes and standards.

11. Be knowledgeable concerning vessel mission and its effect on design.

12. Be aware of computer applications as they apply to naval architecture and marine engineering.

Petroleum Engineering

To produce well-rounded graduates with the following outcome:

1. Apply Knowledge of mathematics, science, engineering fundamentals and specialisation to the solution of complex Petroleum Engineering problems
2. Identify, formulate and analyse complex Petroleum Engineering Problems reaching sustantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
3. Design Solutions for complex Petroleum Engineering problems and design systems, components or processes that meet specified needs with appropriate considerate for public health and safety, cultural, societal, and environmental considerations.
4. Conduct investigation into complex problems using research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex Petroleum Engineering activities, with an understanding of the limitations.
6. Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional Petroleum Engineering Practice.
7. Understand the impact of professional Petroleum Engineering solutions in societal and environment context and demonstrate knowledge of and need for sustainable development.
8. Apply ethical principles and commit to professional practice ethics, responsibilities and norms of engineering practice.
9. Communicate effectively on complex Petroleum Engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
10. Ability to function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings
11. Recognise the need for and have the preparation and ability to engage in indpendent and life-long learning in the broadest context of technological change.
12. Demonstrate knowledge and understanding of Petroleum Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environment.

Mathematics, Statistics and Computing

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

CHEMICAL	CIVIL	COMPUTER ENGINEERING AND INFORMATION TECHNOLOGY	ELECTRICAL
Computer Analysis and Design	Computer Aided Analysis and Design	Mathematical Applications	Mathematical Applications
Economics Analysis for Decision Making	Economics Analysis for Decision Making	Statistical and Numerical Techniques	Statistical and Numerical Techniques
Numerical Methods and Optimisation	Databases and Information Systems	Computer Applications	Computer Applications
Operational Research	Operational Research		
Databases and Information	Business and Management Systems		
	Statistical and Numerical Techniques		

ELECTRONICS	MECHANICAL	NAVAL ARCHITECTURE AND MARINE ENGINEERING	PETROLEUM
Mathematical Applications	Computer Aided Design and Manufacture	Computer Aided Analysis, Design and Manufacture	Computer aided Reservoir Simulation and Management
Statistical and Numerical Techniques	Economics Analysis for Decision Making	Economics Analysis for Decision Making	Economic Analysis for asset Management
Computer Applications	Databases and Information Systems	Database and Information Systems	Data Base Oil Field Management
	Operational Research	Operational Research Techniques	Operational Research
	On-line Control of Operations and Processes	Maritime Economics and Management Systems	Computer aided Well Design
		Statical and Numerical Techniques	Statistical and Numerical Applications
			Programmable Logic Control

(c) Evaluating non-Traditional or Innovative Programme

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

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

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

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

(d) Definition of Complex Problem Solving

The range of **complex problem solving** is defined as follows:

No.	Attribute	**Complex problems** have characteristic WP1 and some or all of WP2 to WP7:
WP1	Depth of Knowledge Required	Cannot be resolved without in-depth engineering knowledge at the level of one or more of WK3, WK4, WK5, WK6 or WK8 which allows a fundamental-based, first principles analytical approach.
WP2	Range of conflicting requirements	Involve wide-ranging or conflicting technical, engineering and other issues.
WP3	Depth of analysis required	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models .
WP4	Familiarity of issues	Involve infrequently encountered issues.
WP5	Extent of applicable codes	Are outside problems encompassed by standards and codes of practice for professional engineering.
WP6	Extent of stakeholder involvement and level of conflicting requirements	Involve diverse groups of stakeholders with widely varying needs.
WP7	Interdependence	Are high level problems including many component parts or sub- problems.

(e) Definition of Complex Engineering Activities

The range of **complex engineering activities** is defined as follows:

No.	Attribute	**Complex activities** mean (engineering) activities or projects that have some or all of the following characteristics:
EA1	Range of resources	Involve the use of diverse resources (and for this purpose resources includes people, money, equipment, materials, information and technologies).
EA2	Level of interactions	Require resolution of significant problems arising from interactions between wide ranging or conflicting technical, engineering or other issues.
EA3	Innovation	Involve creative use of engineering principles and research-based knowledge in novel
EA4	Consequences to society and the environment	Have significant consequences in a range of contexts, characterised by difficulty of prediction and mitigation.
EA5	Familiarity	Can extend beyond previous experiences by applying principles- based approaches.

(f) Knowledge Profile**

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

**A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in 4 to 5 years of study, depending on the level of students at entry.

No.	Knowledge Profile
WK1	A systematic, theory-based understanding of the **natural sciences** applicable to the discipline.
WK2	Conceptually-based **mathematics**, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modelling applicable to the discipline.
WK3	A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline.
WK4	Engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.
WK5	Knowledge that supports **engineering design** in a practice area.
WK6	Knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline.
WK7	**Comprehension of** the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability.
WK8	Engagement with selected knowledge in the **research literature** of the discipline.

APPENDIX C

ENGINEERING EDUCATION ACCREDITATION COMMITTEE

Checklist of Documents for Accreditation*/Approval of New Programme and Relevant Information**

Please tick:

Accreditation	
Approval of New Programme	

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

	Qualifying Requirements for Application Programme Accreditation	Yes/No
1	Outcome-based Education (OBE) implementation.	
2	A minimum 135 credits of which 90 credits must be engineering courses offered over a period of four years. (Based on SLT)	
3	Capstone design project/Integrated Design Project	
4	Final year project (minimum six (6) credits).	
5	Industrial training (minimum of eight (8) weeks).	
6	Full-time academic staff (minimum of eight (8)) with at least three (3) Professional Engineers registered with the MEngC.	
7	Staff: student ratio of 1: 20 or better	
8	External examiner/advisor report. (One in every two (2) academic years.)	

Failure to meet any one 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 EEAC can be made by the IHLs. IHLs are advised to ensure all requirements are fulfilled by the programme before re-applying for accreditation.

For Approval of a New Programme, please fill respond to this Appendix wherever applicable.

INTRODUCTION

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

1. Section A to I: Self-Assessment Report (SAR) to be submitted through the Accreditation Management System (AMS).

2. Section J: Supporting documents to be submitted with the SAR.

A GENERAL INFORMATION

No.	Refer to Section 7.3.1	To be filled out by the IHLs where applicable	Checked by EEAC
1	Name of IHLs.		
2	Address of IHLs.		
3	Name of Faculty/School/Department.		
4	Name and phone number of Staff to be Contacted.		
5	Programme for Accreditation.		
6	EEAC Reference Number.		
7	Degree to be Awarded and Abbreviation.		
8	IHLs 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	IHLs Academic Session.		
14	IHL website.		

B PROGRAMME ACCREDITATION HISTORY

No.	Refer to Section 7.3.1	To be filled out by the IHLs where applicable	Checked by EEAC
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 (PEOs)

Refer to Sections 7.1 and 8.3.2

D CRITERION 2: PROGRAMME OUTCOMES (POs)

Refer to Sections 7.2 and 8.3.3

E CRITERION 3: ACADEMIC CURRICULUM

Refer to Sections 7.3 and 8.3.4

F CRITERION 4: STUDENTS

Refer to Sections 7.4 and 8.3.5

G CRITERION 5: ACADEMIC AND SUPPORT STAFF

Refer to Sections 7.5 and 8.3.6

H CRITERION 6: FACILITIES

Refer to Sections 7.6 and 8.3.7

I CRITERION 7: QUALITY MANAGEMENT SYSTEMS (QMS)

Refer to Sections 7.7 and 8.3.8

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 Team
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 PEOs.		
C6	Sample responded questionnaires/survey forms and/or other tools used to evaluate achievement of the PEOs.		
C8	Documented evidences of how the processes and results obtained from the processes resulted in the CQI of the programme.		
C9	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 PEOs, 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 GA statements.		
D4	Documented evidences of publication or dissemination of definition of GA elements/performance indicators.		
D5	Sample responded questionnaires/survey forms and/or other tools used to establish/formulate/define GA elements/performance indicators, and review of the GAs.		
D6	Documented evidences of publication or dissemination of the OBE model adopted to deliver, assess and evaluate achievement of the GAs.		
D6-D9	'PO box/tray' for each GA explicitly, to cover from mapping of courses to the selected GAs, until the determination of the GA achievements (based the adopted model).		
D10	Documented evidences of established GA management system (computer software etc.).		
D11	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 GAs, and the involvement of various internal and external stakeholders in these processes to support claims made in this section.		
E3	Documented evidences of publication or dissemination of overall 'Courses to GAs' mapping matrix.		
E5	Documented evidences of publication or dissemination of the elaboration/definition of CPS, CEA and Knowledge Profile.		
E6	List of titles of experiments in the laboratory and documented evidences showing open-ended laboratory activities.		
E7	List of industrial training companies.		
E8	List of exposure to professional practice activities and sample students' reports.		

E9	List of final-year project titles.		
E10	Design (capstone) project's synopsis and learning outcomes and Course to Programme Outcomes matrix.		
E11	Documented evidences showing programme implementation of the 'Condition for Passing Courses'.		
E12	Provide documented evidences such as minutes of meetings, training lists and documents, workshop reports, briefing notes, reminders, relevant forms, and internal communications, instructions, etc. of the processes related to Academic Curriculum, and the involvement of various internal and external stakeholders in these processes to support claims made in this section.		
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 GA from an overall holistic perspective, from both curricular and co-curricular activities, such as participating in design competition, public speaking activities, etc.		
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.		
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.		
I1-I6	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(s), and committee members, etc. ▪ External Examiners' reports. ▪ benchmarking report/s. ▪ Provide responses to close the loop of feedback from stakeholders.		

APPENDIX D

EXTERNAL EXAMINER/ADVISOR REPORT

The report should consider assessing the following:

(i) Programme curriculum.

(ii) OBE implementation and achievement of the GAs.

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

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

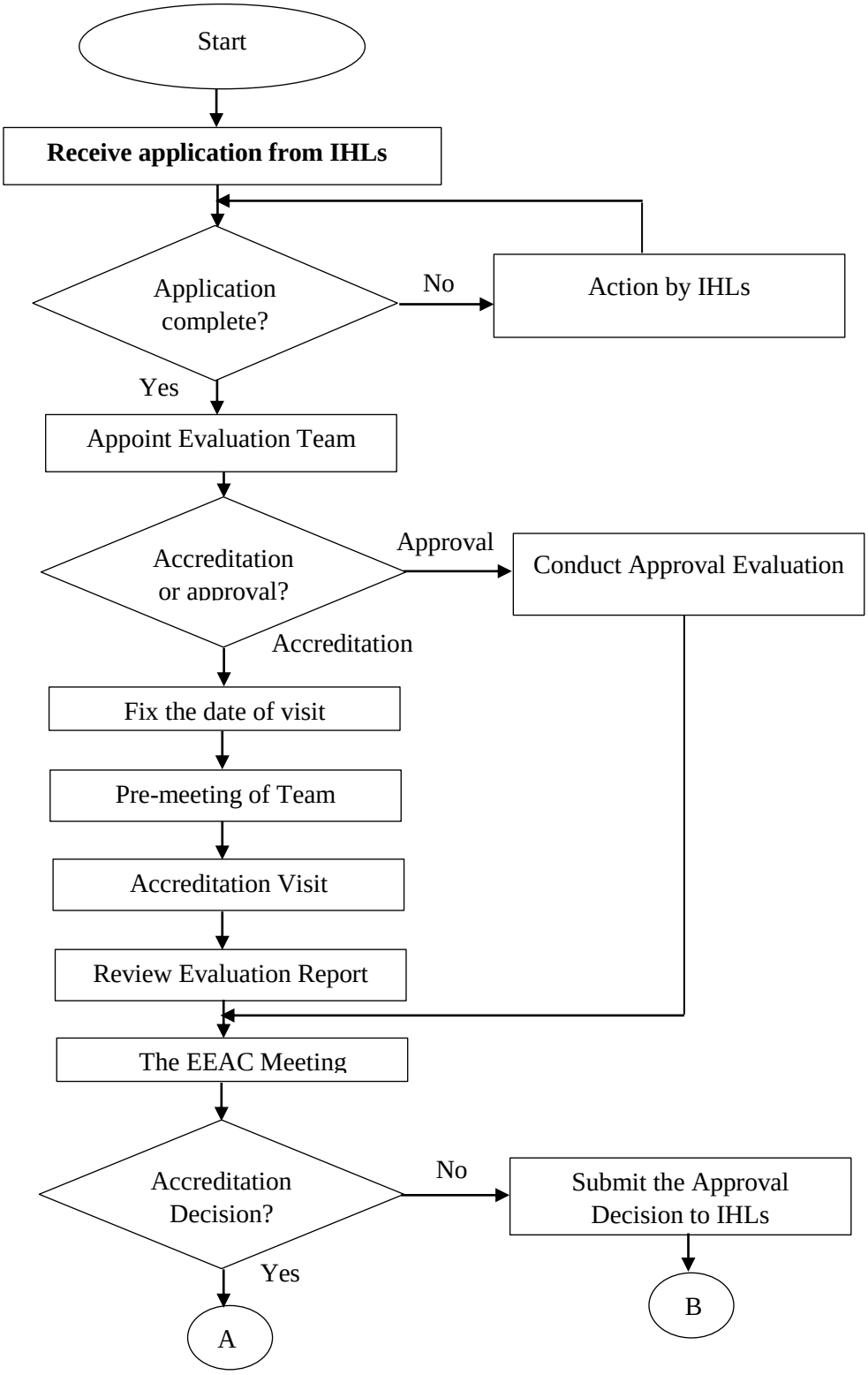
(v) Quality of examination papers as well as other coursework components.

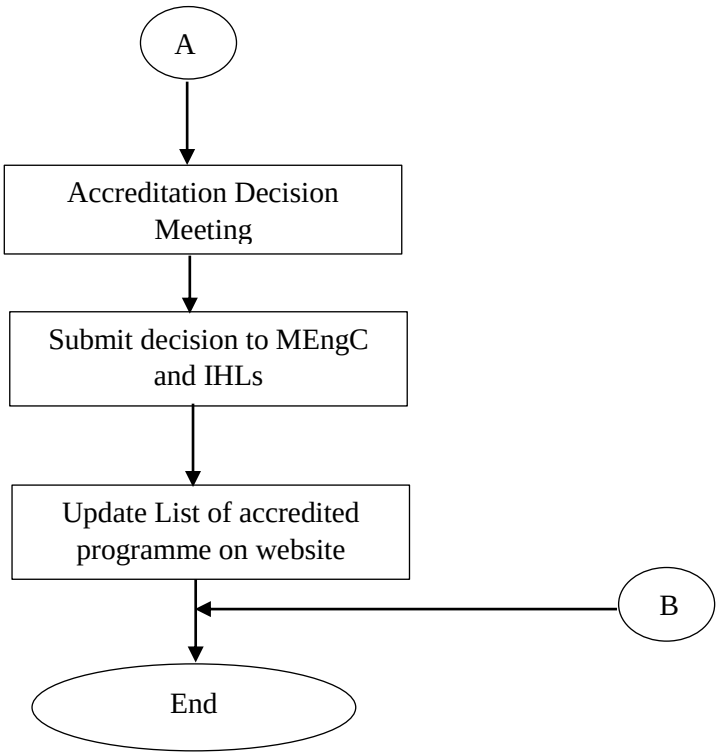
(vi) Quality management system of the programme.

(vii) Facilities that support the programme.

APPENDIX E

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




A
Accreditation Decision Meeting
Submit decision to MEngC and IHLs
Update List of accredited programme on website
B
End

APPENDIX F

TABLE 1 Course to GA Matrix (SAMPLE)

Code	Course	Core/ Elective	Graduate Attributes											
			1	2	3	4	5	6	7	8	9	10	11	12
XX1A	Subject 1	Core	/											
XX1B	Subject 2	Core	/											
XXC	Subject 3	Core	/	/										
XXD	Subject 4	Core	/		/			/						
XX1E	Subject 5	Core						/		/				
XX1F	Subject 6	Core	/								/			
XXG	Subject 7	Core	/	/										
XXH	Subject 8	Core	/											
XX1I	Subject 9	Core		/		/								
XX1J	Subject10	Core		/	/			/			/	/		/
XX2A	Subject 1	Core									/	/		/
XX2B	Subject 2	Core		/		/								
XXC	Subject 3	Core	/										/	
XXD	Subject 4	Core							/	/				/
XX2E	Subject 5	Core		/	/			/			/	/		/
XX2F	Subject 6	Core		/	/	/	/	/			/		/	
XXG	Subject 7	Elective	/										/	
XXH	Subject 8	Elective							/	/				/
XX2I	Subject 9	Elective	/			/								
XX2J	Subject10	Elective			/			/	/					
XX2A	Subject11	Elective		/		/								

TABLE 2 Distribution of Engineering Courses for an Engineering Programme

(SAMPLE)

Groupings	Course Code	Course	Course Type	Student Learning Time							Credits
				Guided Learning					Self-Learning	Others Eg: assessment	
				Lecture	Lab/ Workshop	Project	PBL/ Design	Tutorial			
Broad Area 1	XXXX	Subject 1	Core	28	28	-	-	-	xxx		3
	XXXY	Subject 2	Core	28	-	-	-	28			3
	XXXZ	Subject 3	Core	28	-	28	-	-			3
Broad Area 2	YYYY	Subject 4	Core	42							3
	YYYX	Subject 5	Core	14	28	-	28	-			3
	YYYZ	Subject 6	Core								
Broad Area 3	etc.	etc.									
Broad Area 4											
Elective Courses	FGHI	Elective I	Elective								
	HUK	Elective II	Elective								
	UKL	Elective III	Elective								
Total Credits											
Industrial Training	ABCD	Industrial Training	Core	10 Weeks							5 credits
Final Year Project	BCDE	Project I	Core	Thesis							
	DEFG	Project II	Core	Thesis							
TOTAL CREDITS FOR ENGINEERING COURSES											

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

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

TABLE4 Distribution of General Education Courses for an Engineering Programme (SAMPLE)

Areas (EAC)	Code	Course	Course Type	Student Learning Time						Credits
				Guided Learning				Self-Learning	Others Eg: assessment	
				Lecture	Lab/Work-shop/ Project	Tutorial	Others			
Applied Science/ Maths/Computer	XXX X	Subject 1	Core	42		14	xxx			xxx
	XXX Y	Subject 2	Core	28	28					xxx
	XXX Z	Subject 3	Core	42		6				xxx
	TOTAL CREDITS									**XXX**
Management/Law/ Accountancy	XXX X	Subject 1	Core	42						
	XXX Y	Subject 2	Core	42						
	TOTAL CREDITS									**XXX**
Communication Skills/Humanities/ Ethics	XXX V	Subject 1	Core	35		14				
	XXX W	Subject 2	Core	42						
	XXX X	Subject 3	Core	28						
	XXX Y	Subject 4	Core	28						
	XXX Z	Subject 5	Core	42						
	TOTAL CREDITS									**XXX**
Co-curriculum	H	Co-curriculum 1	Core	14						
	H	Co-curriculum 2	Core	14						
	TOTAL CREDITS									
TOTAL CREDITS FOR GENERAL EDUCATION COURSES										**XXX**

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

Semester	Code	Courses	Course Type	Credits	
				Engineering Courses	Non Engineering Courses
1	XXXA	Subject 1	Core		1
	XXXB	Subject 2	Core	3	
	XXXC	Subject 3	Core	3	
	XXXD	Subject 4	Core		3
	XXXE	Subject 5	Core		3
II	XXXV	Subject 1	Core	3	
	XXXW	Subject 2	Core		3
	XXXX	Subject 3	Core	3	
	XXXY	Subject 4	Core		3
	XXXZ	Subject 5	Core		3
INTER SESSION	etc.	etc.	Core		
III					
IV					
V					
VI					
INTER SESSION					
VII					
VIII					
TOTAL CREDITS					
TOTAL CREDITS					

TABLE 6 Distribution of Student Enrolment for all Academic Years for the Past Six (6) Years

YEAR	YEAR					
	Current academic year - 5	Current academic year - 4	Current academic year - 3	Current academic year - 2	Current academic year - 1	Current academic year
1st Year						
2nd Year						
3rd Year						
4th Year						
5th Year						
6th Year						
Total No. of students Per Year						

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

ENTRY QUALIFICATIONS	NUMBER
Matriculation	

TABLE 8 Breakdown in Terms of Numbers of Academic Staff (Fulltime, Part-Time and Inter programme) by Year for all Academic Years for the Past Six (6) Years

ACADEMIC STAFF	YEAR					
	Current academic year-5	Current academic year-4	Current academic year-3	Current academic year-2	Current academic year-1	Current academic year
(a) Total number of full-time staff (including those servicing other programmes, staff on study or sabbatical leave)						
(b) Full-time equivalent of academic staff servicing other programmes						
(c) Academic staff (on study or sabbatical leave)						
(d) Effective full-time academic staff = (a)-(b)-(c)						
(e) Full-time equivalent of academic staff from other programmes servicing this programme						
(f) Full-time equivalent of part time academic staff						
Full-Time Equivalent Academic Staff (FTES) Contributing to Staff: Student Ratio = (d)+(e)+(f)						

Notes :

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

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

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

Table9 Analysis of all Academic Staff

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

TABLE 10 Academic Qualifications of Academic Staff

Academic Qualifications	Number
Doctorate	
Masters	
Bachelor	
TOTAL	

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

Type of Qualification/Field	**Number**
PE	
RSE	
RE	
AEC	
RGTech	
AGTechC	
RTech	
ATechC	
Others (please specify)	

TABLE 12 Post Held by Academic Staff

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

TABLE 13 Academic Staff Teaching Workload Summary for the Current Semester

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

Table 14 Analysis of all Support Staff

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

TABLE 15 Post Held by Support Staff

Post	Number
TOTAL	

TABLE 16 Staff: Student Ratio

SESSION	**Current academic year - 5**	**Current academic year - 4**	**Current academic year - 3**	**Current academic year - 2**	**Current academic year - 1**	**Current academic year**
RATIO						

Appendix G

Graduate Attributes and Professional Competencies

Version 3: 21 June 2013

This document is available through the IEA website: http://www.ieagreements.org.

Executive Summary

Several accrediting bodies for engineering qualifications have developed outcomes-based criteria for evaluating programmes. Similarly, a number of engineering regulatory bodies have developed or are in the process of developing competency-based standards for registration. Educational and professional accords for mutual recognition of qualifications and registration have developed statements of graduate attributes and professional competency profiles. This document presents the background to these developments, their purpose and the methodology and limitations of the statements. After defining general range statements that allow the competencies of the different categories to be distinguished, the paper presents the graduate attributes and professional competency profiles for three professional tracks: engineer, engineering technologist and engineering technician.

1 Introduction

Engineering is an activity that is essential to meeting the needs of people, economic development and the provision of services to society. Engineering involves the purposeful application of mathematical and natural sciences and a body of engineering knowledge, technology and techniques. Engineering seeks to produce solutions whose effects are predicted to the greatest degree possible in often uncertain contexts. While bringing benefits, engineering activity has potential adverse consequences. Engineering therefore must be carried out responsibly and ethically, use available resources efficiently, be economic, safeguard health and safety, be environmentally sound and sustainable and generally manage risks throughout the entire lifecycle of a system.

Typical engineering activity requires several roles including those of the engineer, engineering technologist and engineering technician, recognized as professional registration categories in many jurisdictions[1]. These roles are defined by their distinctive competencies and their level of responsibility to the public. There is a degree of overlap between roles. The distinctive competencies, together with their educational underpinnings, are defined in sections 4 to 6 of this document.

The development of an engineering professional in any of the categories is an ongoing process with important identified stages. The first stage is the attainment of an *accredited educational qualification,* the graduate stage. The fundamental purpose of *engineering education* is to build a

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The terminology used in this document uses the term *engineering* as an activity in a broad sense and *engineer* as shorthand for the various types of professional and chartered engineer. It is recognized that *engineers*, *engineering technologists* and *engineering technicians* may have specific titles or designations and differing legal empowerment or restrictions within individual jurisdictions.

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knowledge base and attributes to enable the graduate to continue learning and to proceed to formative development that will develop the competencies required for independent practice. The second stage, following after a period of formative development, is *professional registration*. The fundamental purpose of formative development is to build on the educational base to develop the competencies required for independent practice in which the graduate works with engineering practitioners and progresses from an assisting role to taking more individual and team responsibility until competence can be demonstrated at the level required for registration. Once registered, the practitioner must maintain and expand competence.

For engineers and engineering technologists, a third milestone is to qualify for the *international register* held by the various jurisdictions. In addition, engineers, technologists and technicians are expected to maintain and enhance competency throughout their working lives.

Several international accords provide for recognition of graduates of accredited programmes of each signatory by the remaining signatories. The Washington Accord (WA) provides for mutual recognition of programmes accredited for the engineer track. The Sydney Accord (SA) establishes mutual recognition of accredited qualifications for engineering technologist. The Dublin Accord (DA) provides for mutual recognition of accredited qualifications for engineering technicians. These accords are based on the principle of substantial equivalence rather than exact correspondence of content and outcomes. This document records the signatories' consensus on the attributes of graduates for each accord.

Similarly, the International Professional Engineers Agreement[2] (IPEA) and the International Engineering Technologists Agreement[3] (IETA) provide mechanisms to support the recognition of a professional registered in one signatory jurisdiction obtaining recognition in another. The signatories have formulated consensus competency profiles for the registration and these are recorded in this document. While no competence forum currently exists for technicians, competency statements were also formulated for completeness and to facilitate any future development.

Section 2 give the background to the graduate attributes presented in section 5. Section 3 provides background to the professional competency profiles presented in section 6. General range statements are presented in section 4. The graduate attributes are presented in section 5 while the professional competency profiles are defined in section 6. Appendix A defines terms used in this document. Appendix B sketches the origin and development history of the graduate attributes and professional competency profiles.

2 Graduate Attributes

2.1 Purpose of Graduate Attributes

Graduate attributes form a set of individually assessable outcomes that are the components indicative of the graduate's potential to acquire competence to practise at the appropriate level. The graduate attributes are exemplars of the attributes expected of graduate from an accredited programme. Graduate attributes are clear, succinct statements of the expected capability, qualified if necessary by a range indication appropriate to the type of programme.

The graduate attributes are intended to assist Signatories and Provisional Members to develop outcomes-based accreditation criteria for use by their respective jurisdictions. Also, the graduate attributes guide bodies developing their accreditation systems with a view to seeking signatory status.

Graduate attributes are defined for educational qualifications in the engineer, engineering technologist and engineering technician tracks. The graduate attributes serve to identify the distinctive characteristics as well as areas of commonality between the expected outcomes of the different types of programmes.

2.2 Limitation of Graduate Attributes

Each signatory defines the standards for the relevant track (engineer, engineering technologist or engineering technician) against which engineering educational programmes are accredited. Each educational level accord is based on the principle of *substantial equivalence*, that is, programmes are not expected to have identical outcomes and content but rather produce graduates who could enter employment and be fit to undertake a programme of training and experiential learning leading to professional competence and registration. The graduate attributes provide a point of reference for bodies to describe the outcomes of substantially equivalent qualification. The graduate attributes do not, in themselves, constitute an "international standard" for accredited qualifications but provide a widely accepted common reference for bodies to describe the outcomes of substantially equivalent qualifications.

The term graduate does not imply a particular type of qualification but rather the exit level of the qualification, be it a degree or diploma.

2.3 Graduate Attributes and the Quality of Programmes

The Washington, Sydney and Dublin Accords "recognise the substantial equivalence of … programmes satisfying the academic requirements for practice …" for engineers, engineering technologists and engineering technicians respectively. The Graduate Attributes are assessable outcomes, supported by level statements, developed by the signatories that give confidence that the educational objectives of programmes are being achieved. The quality of a programme depends not only on the stated objectives and attributes to be assessed but also on the programme design, resources committed to the programme, the teaching and learning process and assessment of students, including confirmation that the graduate attributes are satisfied. The Accords therefore base the judgement of the substantial equivalence of programmes accredited by signatories on both the Graduate Attributes and the best practice indicators for evaluating programme quality listed in the Accords' Rules and Procedures[4].

2.4 Scope and Organisation of Graduate Attributes

The graduate attributes are organized using twelve headings shown in section 5.2. Each heading identifies the differentiating characteristic that allows the distinctive roles of engineers, technologists and technicians to be distinguished by range information.

For each attribute, statements are formulated for engineer, engineering technologist and engineering technician using a common stem, with ranging information appropriate to each

educational track defined in sections 4.1 and 5.1. For example, for the **Knowledge of Engineering Sciences** attribute:

Common Stem: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization …

Engineer Range: … as described in the engineer knowledge profile to the solution of complex engineering problems.

Engineering Technologist Range: … as described in the engineering technologist knowledge profile to defined and applied engineering procedures, processes, systems or methodologies.

Engineering Technician Range: … as described in the engineering technician knowledge profile to wide practical procedures and practices.

The resulting statements are shown below for this example:

… for Washington Accord Graduate	… for Sydney Accord Graduate	… for Dublin Accord Graduate
Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization as specified in WK1-WK4 respectively to the solution of complex engineering problems.	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization as specified in SK1-SK4 respectively to defined and applied engineering procedures, processes, systems or methodologies.	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization as specified in DK1-DK4 respectively to wide practical procedures and practices.

The range qualifier in several attribute statements uses the notions of *complex engineering problems*, *broadly-defined engineering problems* and *well-defined engineering problems*. These shorthand level descriptors are defined in section 4.1.

The attributes are chosen to be universally applicable and reflect acceptable minimum standards and be capable of objective measurement. While all attributes are important, individual attributes are not necessarily of equal weight. Attributes are selected that are expected to be valid for

extended periods and changed infrequently only after considerable debate. Attributes may depend on information external to this document, for example generally accepted principles of ethical conduct.

The full set of graduate attribute definitions is given in section 5.

2.5 Contextual Interpretation

The graduate attributes are stated generically and are applicable to all engineering disciplines. In interpreting the statements within a disciplinary context, individual statements may be amplified and given particular emphasis but must not be altered in substance or individual elements ignored.

2.6 Best Practice in Application of Graduate Attributes

The attributes of Accord programmes are defined as a *knowledge profile,* an indicated volume of learning and the attributes against which graduates must be able to perform. The requirements are stated without reference to the design of programmes that would achieve the requirements. Providers therefore have freedom to design programmes with different detailed structure, learning pathways and modes of delivery. Evaluation of individual programmes is the concern of national accreditation systems.

3 Professional Competency Profiles

3.1 Purpose of Professional Competency Profiles

A professionally or occupationally *competent person* has the attributes necessary to perform the activities within the profession or occupation to the standards expected in independent employment or practice. The *professional competency profiles* for each professional category record the elements of competency necessary for competent performance that the professional is expected to be able to demonstrate in a holistic way at the stage of attaining registration.

Professional competence can be described using a set of attributes corresponding largely to the graduate attributes, but with different emphases. For example, at the professional level, the ability to take responsibility in a real-life situation is essential. Unlike the graduate attributes, professional competence is more than a set of attributes that can be demonstrated individually. Rather, competence must be assessed holistically.

3.2 Scope and Organisation of Professional Competency Profiles

The professional competency profiles are written for each of the three categories: engineer, engineering technologist and engineering technician at the point of registration[5]. Each profile consists of thirteen elements. Individual elements are formulated around a differentiating characteristic using a stem and modifier, similarly to the method used for the graduate attributes described in section 2.3.

The stems are common to all three categories and the range modifiers allow distinctions and commonalities between categories to be identified. Like their counterparts in the graduate attributes, the range statements use the notions of complex engineering problems, broadly-defined engineering problems and well-defined engineering problems defined in section 4.1. At the professional level, a classification of engineering activities is used to define ranges and to distinguish between categories. Engineering activities are classified as *complex, broadly-defined* or *well-defined*. These shorthand level descriptors are defined in section 4.2.

3.3 Limitations of Professional Competency Profile

As in the case of the graduate attributes, the professional competency profiles are not prescriptive in detail but rather reflect the essential elements that would be present in competency standards.

The professional competency profiles do not specify performance indicators or how the above items should be interpreted in assessing evidence of competence from different areas of practice or for different types of work. Section 3.4 examines contextual interpretation.

Each jurisdiction may define *performance indicators***,** that is actions on the part of the candidate that demonstrate competence. For example, a design competency may be evidenced by the following performances:

1. *Identify and analyse design/ planning requirement and draw up detailed requirements specification*
2. *Synthesise a range of potential solutions to problem or approaches to project execution*
3. *Evaluate the potential approaches against requirements and impacts outside requirements*
4. *Fully develop design of selected option*
5. *Produce design documentation for implementation*

3.4 Contextual Interpretation

Demonstration of competence may take place in different areas of practice and different types of work. Competence statements are therefore discipline-independent. Competence statements accommodate different types of work, for example design, research and development and engineering management by using the broad phases in the cycle of engineering activity: problem analysis, synthesis, implementation, operation and evaluation, together the management attributes needed. The competence statements include the personal attributes needed for competent performance irrespective of specific local requirements: communication, ethical practice, judgement, taking responsibility and the protection of society.

The professional competency profiles are stated generically and are applicable to all engineering disciplines. The application of a competency profile may require amplification in different regulatory, disciplinary, occupational or environmental contexts. In interpreting the statements within a particular context, individual statements may be amplified and given particular emphasis but must not be altered in substance or ignored.

3.5 Mobility between Professional Categories

The graduate attributes and professional competency for each of three categories of engineering practitioner define the benchmark route or vertical progression in each category. This document does not address the movement of individuals between categories, a process that usually required additional education, training and experience. The graduate attributes and professional competencies, through their definitions of level of demand, knowledge profile and outcomes to be achieved, allow a person planning such a change to gauge the further learning and experience that will be required. The education and registration requirements of the jurisdiction should be examined for specific requirements.

4 Common Range and Contextual Definitions

4.1 Range of Problem Solving

References to the Knowledge Profile are shown thus: (WK3, WK4 …)

In the context of both Graduate Attributes and Professional Competencies:			
Attribute	***Complex Engineering Problems*** have characteristic WP1 and some or all of WP2 to WP7*:*	***Broadly-defined Engineering Problems*** **have characteristic SP1 and some or all of SP2 to SP7*:***	***Well-defined Engineering Problems*** have characteristic DP1 and some or all of DP2 to DP7*:*
Depth of Knowledge Required	**WP1:** Cannot be resolved without in-depth engineering knowledge at the level of one or more of WK3, WK4, WK5, WK6 or WK8 which allows a fundamentals-based, first principles analytical approach	**SP1:** 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	**DP1:** Cannot be resolved without extensive practical knowledge as reflected in DK5 and DK6 supported by theoretical knowledge defined in DK3 and DK4
Range of conflicting requirements	**WP2:** Involve wide-ranging or conflicting technical, engineering and other issues	**SP2:** Involve a variety of factors which may impose conflicting constraints	**DP2:** Involve several issues, but with few of these exerting conflicting constraints
Depth of analysis required	**WP3:** Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models	**SP3:** Can be solved by application of well-proven analysis techniques	**DP3:** Can be solved in standardised ways
Familiarity of issues	**WP4:** Involve infrequently encountered issues	**SP4:** Belong to families of familiar problems which are solved in well-	**DP4:** Are frequently encountered and thus familiar to most

		accepted ways	practitioners in the practice area
Extent of applicable codes	**WP5:** Are outside problems encompassed by standards and codes of practice for professional engineering	**SP5:** May be partially outside those encompassed by standards or codes of practice	**DP5:** Are encompassed by standards and/or documented codes of practice
Extent of stakeholder involvement and conflicting requirements	**WP6:** Involve diverse groups of stakeholders with widely varying needs	**SP6:** Involve several groups of stakeholders with differing and occasionally conflicting needs	**DP6:** Involve a limited range of stakeholders with differing needs
Interdependence	**WP 7:** Are high level problems including many component parts or sub-problems	**SP7:** Are parts of, or systems within complex engineering problems	**DP7:** Are discrete components of engineering systems
In addition, in the context of the Professional Competencies			
Consequences	**EP1: Have significant consequences in a range of contexts**	**TP1:**Have consequences which are important locally, but may extend more widely	**NP1:** Have consequences which are locally important and not far-reaching
Judgement	**EP2: Require judgement in decision making**	**TP2: Require judgement in decision making**	

4.2 Range of Engineering Activities

Attribute	Complex Activities	Broadly-defined Activities	Well-defined Activities
Preamble	**Complex activities** means (*engineering)* activities or projects that have some or all of the following characteristics:	**Broadly defined activities** means (*engineering)* activities or projects that have some or all of the following characteristics:	**Well-defined activities** means *(engineering)* activities or projects that have some or all of the following characteristics:
Range of resources	**EA1:** Involve the use of diverse resources (and for this purpose resources includes people, money, equipment, materials, information and technologies)	**TA1:** Involve a variety of resources (and for this purposes resources includes people, money, equipment, materials, information and technologies)	**NA1:** Involve a limited range of resources (and for this purpose resources includes people, money, equipment, materials, information and technologies)
Level of interactions	**EA2:** Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues,	**TA2:** Require resolution of occasional interactions between technical, engineering and other issues, of which few are conflicting	**NA2:** Require resolution of interactions between limited technical and engineering issues with little or no impact of wider issues
Innovation	**EA3:** Involve creative use of engineering principles and research-based knowledge in novel ways.	**TA3:** Involve the use of new materials, techniques or processes in non-standard ways	**NA3:** Involve the use of existing materials techniques, or processes in modified or new ways
Consequences to society and the environment	**EA4:** Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation	**TA4:** Have reasonably predictable consequences that are most important locally, but may extend more widely	**NA4:** Have consequences that are locally important and not far-reaching
Familiarity	**EA5:** Can extend beyond previous experiences by applying principles-based approaches	**TA5:** Require a knowledge of normal operating procedures and processes	**NA5:** Require a knowledge of practical procedures and practices for widely-applied operations and processes

5 Accord programme profiles

The following tables provides profiles of graduates of three types of tertiary education engineering programmes. See section 4 for definitions of complex engineering problems, broadly-defined engineering problems and well-defined engineering problems.

5.1 Knowledge profile

A Washington Accord programme provides:	**A Sydney Accord programme** provides:	**A Dublin Accord programme** provides:
WK1: A systematic, theory-based understanding of the **natural sciences** applicable to the discipline	**SK1:** A systematic, theory-based understanding of the **natural sciences** applicable to the sub-discipline	**DK1:** A descriptive, formula-based understanding of the **natural sciences** applicable in a sub-discipline
WK2: Conceptually-based **mathematics**, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modelling applicable to the discipline	**SK2:** Conceptually-based **mathematics**, numerical analysis, statistics and aspects of computer and information science to support analysis and use of models applicable to the sub-discipline	**DK2:** Procedural **mathematics**, numerical analysis, statistics applicable in a sub-discipline
WK3: A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline	**SK3:** A systematic , theory-based formulation of **engineering fundamentals** required in an accepted sub-discipline	**DK3:** A coherent procedural formulation of **engineering fundamentals** required in an accepted sub-discipline
WK4: Engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.	**SK4:** Engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for an accepted sub-discipline	**DK4:** Engineering **specialist knowledge** that provides the body of knowledge for an accepted sub-discipline

WK5: Knowledge that supports **engineering design** in a practice area	**SK5: Knowledge** that supports **engineering design** using the technologies of a practice area	**DK5: Knowledge** that supports **engineering design** based on the techniques and procedures of a practice area
WK6: Knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline	**SK6:** Knowledge of **engineering technologies** applicable in the sub-discipline	**DK6:** Codified **practical engineering knowledge** in recognised practice area.
WK7: Comprehension of the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability	**SK7: Comprehension of** the role of technology in society and identified issues in applying engineering technology: ethics and impacts: economic, social, environmental and sustainability	**DK7: Knowledge** of issues and approaches in engineering technician practice: ethics, financial, cultural, environmental and sustainability impacts
WK8: Engagement with selected knowledge in the **research literature** of the discipline	**SK8:** Engagement with the **technological literature** of the discipline	
A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in 4 to 5 years of study, depending on the level of students at entry.	A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in 3 to 4 years of study, depending on the level of students at entry.	A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in 2 to 3 years of study, depending on the level of students at entry.

5.2 Graduate Attribute Profiles

References to the Knowledge Profile are shown thus: (WK1 to WK4) **Differentiating Characteristic**	**… for Washington Accord Graduate**	**… for Sydney Accord Graduate**	**… for Dublin Accord Graduate**
Engineering Knowledge:	**WA1:** Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.	**SA1:** Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in SK1 to SK4 respectively to defined and applied engineering procedures, processes, systems or methodologies.	**DA1:** Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in DK1 to DK4 respectively to wide practical procedures and practices.
Problem Analysis Complexity of analysis	**WA2:** Identify, formulate, research literature and analyse *complex* engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)	**SA2:** Identify, formulate, research literature and analyse *broadly-defined* engineering problems reaching substantiated conclusions using analytical tools appropriate to the discipline or area of specialisation. (SK1 to SK4)	**DA2:** Identify and analyse *well-defined* engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity. (DK1 to DK4)
Design/ development of solutions: Breadth and uniqueness of engineering	**WA3:** Design solutions for *complex* engineering problems and design systems, components or processes that meet specified	**SA3:** Design solutions for *broadly- defined* engineering technology problems and *contribute to* the design of systems,	**DA3:** Design solutions for *well-defined* technical problems and *assist with* the design of systems,

problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified	needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)	components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (SK5)	components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (DK5)
Investigation: Breadth and depth of investigation and experimentation	**WA4:** Conduct investigations of *complex* problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.	**SA4:** Conduct investigations of *broadly-defined* problems; locate, search and select relevant data from codes, data bases and literature (SK8), design and conduct experiments to provide valid conclusions.	**DA4:** Conduct investigations of *well-defined* problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.
Modern Tool Usage: Level of understanding of the appropriateness of the tool	**WA5:** Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to *complex* engineering problems, with an understanding of the limitations. (WK6)	**SA5:** Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to *broadly-defined* engineering problems, with an understanding of the limitations. (SK6)	**DA5:** Apply appropriate techniques, resources, and modern engineering and IT tools to *well-defined* engineering problems, with an awareness of the limitations. (DK6)
The Engineer and Society: Level of knowledge and responsibility	**WA6: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to**	**SA6: Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering**	**DA6: Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities**

	professional engineering practice and solutions to complex engineering problems. (WK7)	**technology practice and solutions to broadly defined engineering problems. (SK7)**	**relevant to engineering technician practice and solutions to well defined engineering problems. (DK7)**
Environment and Sustainability: Type of solutions.	**WA7: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (WK7)**	**SA7: Understand and evaluate the sustainability and impact of engineering technology work in the solution of broadly defined engineering problems in societal and environmental contexts. (SK7)**	**DA7: Understand and evaluate the sustainability and impact of engineering technician work in the solution of well defined engineering problems in societal and environmental contexts. (DK7)**
Ethics: Understanding and level of practice	**WA8: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)**	**SA8: Understand and commit to professional ethics and responsibilities and norms of engineering technology practice. (SK7)**	**DA8: Understand and commit to professional ethics and responsibilities and norms of technician practice. (DK7)**
Individual and Team work: Role in and diversity of team	**WA9: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.**	**SA9: Function effectively as an individual, and as a member or leader in diverse teams.**	**DA9: Function effectively as an individual, and as a member in diverse technical teams.**
Communication: Level of communication according to type of activities	**WA10: Communicate effectively on complex engineering activities with the engineering community and with society**	**SA10: Communicate effectively on broadly-defined engineering activities with the engineering community and**	**DA10: Communicate effectively on well-defined engineering activities with the engineering**

performed	**at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.**	**with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions**	**community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions**
Project Management and Finance: **Level of management required for differing types of activity**	**WA11: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.**	**SA11: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a team and to manage projects in multidisciplinary environments.**	**DA11: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments**
Lifelong learning: **Preparation for and depth of continuing learning.**	**WA12: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.**	**SA12: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.**	**DA12: Recognize the need for, and have the ability to engage in independent updating in the context of specialized technical knowledge.**

6 Professional Competency Profiles

To meet the minimum standard of competence a person must demonstrate that he/she is able to practice competently in his/her practice area to the standard expected of a reasonable Professional Engineer/Engineering Technologist/Engineering Technician.

The extent to which the person is able to perform each of the following elements in his/her practice area must be taken into account in assessing whether or not he/she meets the overall standard. **Differentiating Characteristic**	**Professional Engineer**	**Engineering Technologist**	**Engineering Technician**
Comprehend and apply universal knowledge: Breadth and depth of education and type of knowledge	**EC1:** Comprehend and apply advanced knowledge of the widely-applied principles underpinning good practice	**TC1:** Comprehend and apply the knowledge embodied in widely accepted and applied procedures, processes, systems or methodologies	**NC1:** Comprehend and apply knowledge embodied in standardised practices
Comprehend and apply local knowledge: Type of local knowledge	**EC2:** Comprehend and apply advanced knowledge of the widely-applied principles underpinning good practice specific to the	**TC2:** Comprehend and apply the knowledge embodied procedures, processes, systems or methodologies that is	**NC2:** Comprehend and apply knowledge embodied in standardised practices specific to the

	jurisdiction in which he/she practices.	specific to the jurisdiction in which he/she practices.	jurisdiction in which he/she practices.
Problem analysis: Complexity of analysis	**EC3: Define, investigate and analyse complex problems**	**TC3:** Identify, clarify, and analyse broadly-defined problems	**NC3:** Identify, state and analyse well-defined problems
Design and development of solutions: Nature of the problem and uniqueness of the solution	**EC4: Design or develop solutions to complex problems**	**TC4:** Design or develop solutions to broadly-defined problems	**NC4:** Design or develop solutions to well-defined problems
Evaluation: Type of activity	**EC5:** Evaluate the outcomes and impacts of complex activities	**TC4:** Evaluate the outcomes and impacts of broadly defined activities	**NC5:** Evaluate the outcomes and impacts of well-defined activities
Protection of society: Types of activity and responsibility to public	**EC6:** Recognise the reasonably foreseeable social, cultural and environmental effects of complex activities generally, and have regard to the need for sustainability; recognise that the protection of society is the highest priority	**TC6:** Recognise the reasonably foreseeable social, cultural and environmental effects of broadly-defined activities generally, and have regard to the need for sustainability; take responsibility in all these activities to avoid putting the public at risk.	**NC6:** Recognise the reasonably foreseeable social, cultural and environmental effects of well-defined activities generally, and have regard to the need for sustainability; use engineering technical expertise to prevent dangers to the public.
Legal and regulatory: No differentiation in this characteristic	**EC7: Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities**	**TC7: Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities**	**NC7: Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities**

Ethics: No differentiation in this characteristic	**EC8: Conduct his or her activities ethically**	**TC8: Conduct his or her activities ethically**	**NC8: Conduct his or her activities ethically**
Manage engineering activities: Types of activity	**EC9: Manage part or all of one or more complex activities**	**TC9: Manage part or all of one or more broadly-defined activities**	**NC9: Manage part or all of one or more well-defined activities**
Communication: No differentiation in this characteristic	**EC10: Communicate clearly with others in the course of his or her activities**	**TC10: Communicate clearly with others in the course of his or her activities**	**NC10: Communicate clearly with others in the course of his or her activities**
Lifelong learning: Preparation for and depth of continuing learning.	**EC11: Undertake CPD activities sufficient to maintain and extend his or her competence**	**TC11: Undertake CPD activities sufficient to maintain and extend his or her competence**	**NC11: Undertake CPD activities sufficient to maintain and extend his or her competence**
Judgement: Level of developed knowledge, and ability and judgement in relation to type of activity	**EC11: Recognize complexity and assess alternatives in light of competing requirements and incomplete knowledge. Exercise sound judgement in the course of his or her complex activities**	**TC12: Choose appropriate technologies to deal with broadly defined problems. Exercise sound judgement in the course of his or her broadly-defined activities**	**NC12: Choose and apply appropriate technical expertise. Exercise sound judgement in the course of his or her well-defined activities**
Responsibility for decisions: Type of activity for which responsibility is taken	**EC12: Be responsible for making decisions on part or all of complex activities**	**TC13: Be responsible for making decisions on part or all of one or more broadly defined activities**	**NC13: Be responsible for making decisions on part or all of all of one or more well-defined activities**

Definitions of terms

Note: These definitions apply to terms used in this document but also indicate equivalence to terms used in other engineering education standards.

Branch of engineering: a generally-recognised, major subdivision of engineering such as the traditional *disciplines* of Chemical, Civil, or Electrical Engineering, or a cross-disciplinary field of comparable breadth including combinations of engineering fields, for example Mechatronics, and the application of engineering in other fields, for example Bio-Medical Engineering.

Broadly-defined engineering problems: a class of problem with characteristics defined in section 4.1.

Broadly-defined engineering activities: a class of activities with characteristics defined in section 4.2.

Complementary (contextual) knowledge: Disciplines other than engineering, basic and mathematical sciences, that support engineering practice, enable its impacts to be understood and broaden the outlook of the engineering graduate.

Complex engineering problems: a class of problem with characteristics defined in section 4.1.

Complex engineering activities: a class of activities with characteristics defined in section 4.2.

Continuing Professional Development: the systematic, accountable maintenance, improvement and broadening of knowledge and skills, and the development of personal qualities necessary for the execution of professional and technical duties throughout an engineering practitioner's career.

Engineering sciences: include engineering fundamentals that have roots in the mathematical and physical sciences, and where applicable, in other natural sciences, but extend knowledge and develop models and methods in order to lead to applications and solve problems, providing the knowledge base for engineering specializations.

Engineering design knowledge: Knowledge that supports engineering design in a practice area, including codes, standards, processes, empirical information, and knowledge reused from past designs.

Engineering discipline: synonymous with *branch of engineering.*

Engineering fundamentals: a systematic formulation of engineering concepts and principles based on mathematical and natural sciences to support applications.

Engineering management: the generic management functions of planning, organising, leading and controlling, applied together with engineering knowledge in contexts including the management of projects, construction, operations, maintenance, quality, risk, change and business.

Engineering problem: is a problem that exists in any domain that can be solved by the application of engineering knowledge and skills and generic competencies.

Engineering practice area: a generally accepted or legally defined area of engineering work or engineering technology.

Engineering speciality or specialization: a generally-recognised practice area or major subdivision within an engineering discipline, for example Structural and Geotechnical Engineering within Civil Engineering; the extension of engineering fundamentals to create theoretical frameworks and bodies of knowledge for engineering practice areas.

Engineering technology: is an established body of knowledge, with associated tools, techniques, materials, components, systems or processes that enable a family of practical applications and that relies for its development and effective application on engineering knowledge and competency.

Forefront of the professional discipline/branch[6]: defined by advanced practice in the specialisations within the discipline.

Formative development: the process that follows the attainment of an accredited education programme that consists of training, experience and expansion of knowledge.

Manage: means planning, organising, leading and controlling in respect of risk, project, change, financial, compliance, quality, ongoing monitoring, control and evaluation.

Mathematical sciences: mathematics, numerical analysis, statistics and aspects of computer science cast in an appropriate mathematical formalism.

Natural sciences: Provide, as applicable in each engineering discipline or practice area, an understanding the physical world including physics, mechanics, chemistry, earth sciences and the biological sciences,

Practice area: *in the educational context:* synonymous with generally-recognised engineering speciality; *at the professional level:* a generally recognised or distinctive area of knowledge and expertise developed by an engineering practitioner by virtue of the path of education, training and experience followed.

Solution: means an effective proposal for resolving a problem, taking into account all relevant technical, legal, social, cultural, economic and environmental issues and having regard to the need for sustainability.

Subdiscipline: Synonymous with *engineering speciality*.

Substantial equivalence: applied to educational programmes means that two or more programmes, while not meeting a single set of criteria, are both acceptable as preparing their respective graduates to enter formative development toward registration.

Well-defined engineering problems: a class of problem with characteristics defined in section 4.1.

Well-defined engineering activities: a class of activities with characteristics defined in section 4.2.

Appendix H

1.0 THE FEIAP ENGINEERING EDUCATION ACCREDITATION SYSTEM MODEL FRAMEWORK FOR ENGINEER

The FEIAP Engineering Education Guidelines for Engineer incorporate a model framework for the accreditation system and are adaptive to the needs of member economies. The Engineering Education Model framework for Engineer will guide the development of an engineering program accreditation system that focuses on delivery of assured engineering graduate outcomes appropriate to a particular economy at a particular stage in development. The following phased development sequence is projected:

- Engineering graduate capabilities appropriate to a period of 'nation building';
- Engineering Graduate capabilities benchmarked against FEIAP Education Guideline for Engineer or Washington Accord under the International Engineering Alliance (IEA) or other equivalent systems.

The FEIAP Engineering Education Accreditation System Model Framework for Engineer will provide guidance on the development of accreditation system documentation such as an engineering graduate outcomes specification; specific accreditation criteria and associated performance indicators and expectations; self-review submission requirements, accreditation processes and governance.

1.1 Graduate Outcomes Specification

Engineering involves the application of mathematics, natural and physical sciences, and a substantive body of knowledge to the solution of complex problems within broad and often uncertain contexts. Engineering practice needs to be carried out responsibly and ethically, manage risks and be accountable for the entire life cycle of a solution and its effects. Engineering practice must consider economic, public health, safety, legal, social, environment and sustainability factors and engineering practitioners must have the skills and attributes to communicate and work in teams with professionals in wide ranging fields.

Engineering practice skills and knowledge development is a lifelong process, and begins very much with a foundation education qualification. The fundamental purpose of this educational foundation is to build knowledge capabilities, attributes, skills and values which equip the graduate for entry to practice in the career category of engineer. The second stage of formative development occurs as the new engineering graduate works for a period of time, under

supervision as a member of the engineering team, and develops the mature competencies for independent practice and registration as an engineer. In parallel with continuing professional development, the foundation education qualification provides the required educational basis for independent practice and registration.

The prime objective of an accreditation system is to evaluate the engineering educational experiences and assessment processes being provided in the foundation engineering education program, and to pass judgment on the appropriateness and quality of the engineering graduate outcomes that are projected as a consequence of the engineering educational experiences.

Outcomes-based accreditation criteria will address wide ranging factors that influence the standard of engineering graduate outcomes, and these will include inputs and processes, as well as direct observation of certain outcomes.

To facilitate such an evaluation it is critical that the Engineering Education Accreditation Body is able to provide a benchmark statement of expected engineering graduate outcomes in the particular career category. Such a statement will provide a key reference for both engineering education developers as well as those involved in developing and implementing the accreditation criteria and processes. The benchmark statement of expected engineering graduate outcomes will most certainly comprise a generic component that is applicable to all fields of practice. It may well also provide some discipline specific graduate outcome guidelines which address the underpinning skills and knowledge, specialist technical competence and engineering application abilities within designated fields of practice. This level of detail in the outcomes specification is more likely however to be the responsibility of the engineering educational provider in consultation with stakeholders, as the educational design process unfolds for a particular engineering program within a nominated discipline.

Any foundation engineering education program must be based on a defined graduate outcomes specification that sets out the capability targets for engineering graduates in the particular career category as clear, succinct, assessable statements that cover underpinning knowledge and skills, technical competencies, engineering application capability as well as personal and professional attributes, capabilities, values and attitudes. Such a specification for an individual education program must be demonstrably compliant with the corresponding benchmark statement of engineering graduate outcomes set out by the engineering education accreditation body if the program is to be considered for accreditation within the economies of the engineering education accreditation body. The benchmark statement of engineering graduate outcomes set by the

engineering education accreditation body thus drives the processes of educational design and program accreditation.

In order to ensure the substantial equivalence of engineering graduates from engineering programs which arise across the boundaries of accreditation economies, it is essential that the benchmark statements of engineering graduate outcome expectations set up by various engineering education accreditation bodies satisfy a common point of reference or standard. To help facilitate this, the Washington Accord under the International Engineering Alliance (IEA) has published a Graduate Attributes Exemplar Statement for Engineer (Appendix 1). This Statement sets out a generic knowledge profile as well as generic attributes which are expected to characterise engineering graduates within a particular career category. The Exemplar Statement provides a template or framework for Engineering Education Accord signatories as they in turn establish localised benchmark statements of engineering graduate outcome expectations. The Exemplar Statement thus assists in achieving substantial equivalence of engineering graduate outcome expectations across education programs and across accreditation economies. The economy's benchmark statement of outcomes is naturally tuned to the needs of engineering practice within the geographic economy of the Accord signatory, and subsequently provides a framework for engineering education providers as they devise the detailed specification of graduate outcomes for an engineering education program in any particular engineering discipline.

The Graduate Attributes Exemplar Statement of Engineers published under the IEA is commended as a useful guideline reference for established and emerging accreditation bodies within FEIAP. This Statement provides a generic standard for the knowledge profile and the attributes against which engineering graduates must be able to perform. Each Exemplar Statement is generic in nature and so is universally applicable to all engineering disciplines. Each knowledge and attribute element has a common stem with separate range qualifiers set out to identify the appropriate outcomes for engineer. The International Engineering Alliance has published a companion Exemplar Statement for the mature practitioner, to assist with the achievement of substantial equivalence within the registration/licensing process. This Statement is titled – 'Professional Competency Profile' and mirrors the corresponding 'Graduate Attributes Exemplar'.

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The specification of graduate outcomes is thus formalised at three levels as shown in the Figure 1.1.

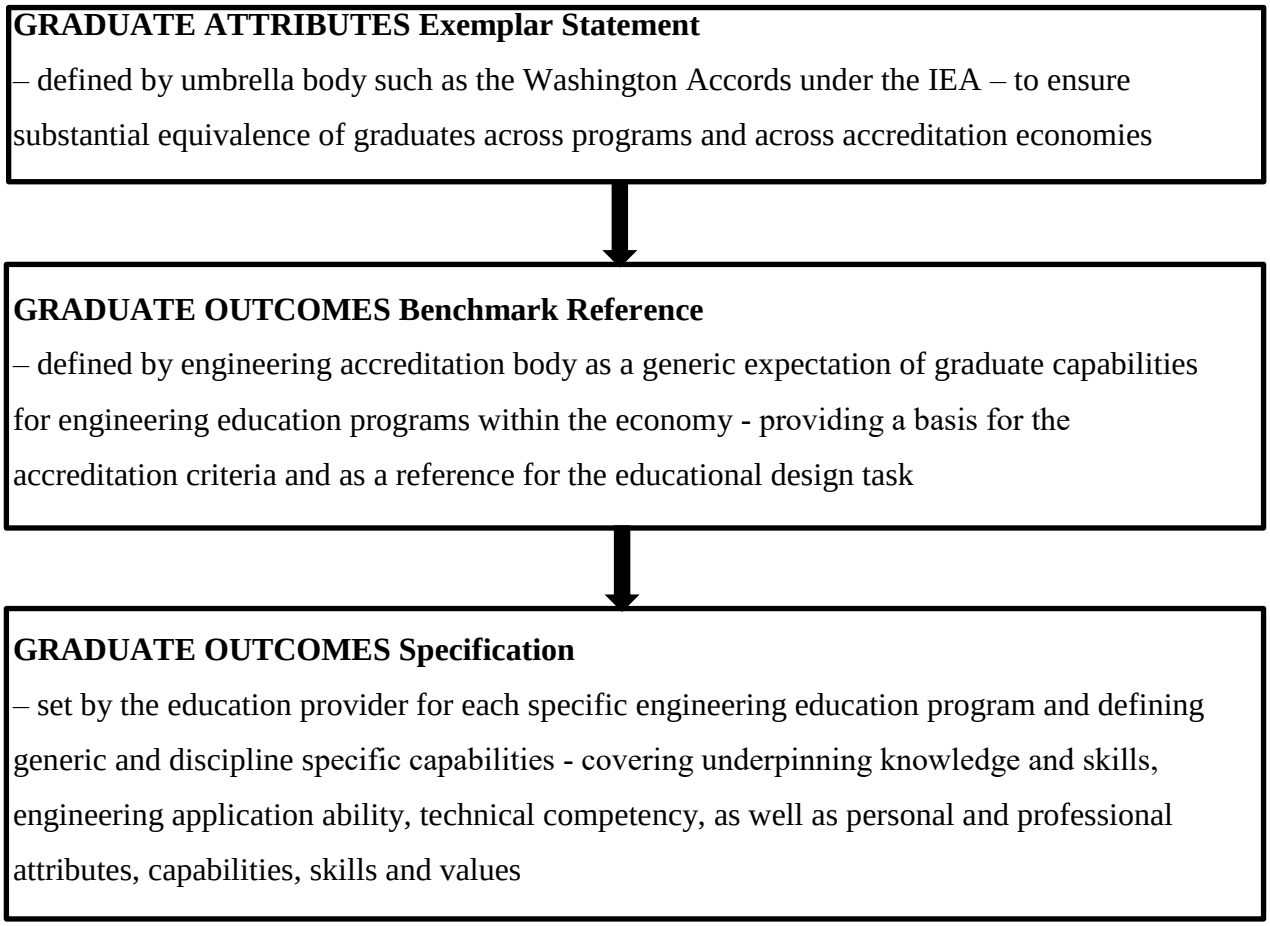

Figure 1.1 Hierarchy of references for ensuring substantial equivalence of engineering graduate outcomes between engineering education programs, within and across accreditation economies.

1.2 Accreditation Criteria

An outcomes-based accreditation system must evaluate the educational experiences and assessment processes set out in the foundation engineering education program, and pass judgment on the appropriateness and quality of the engineering graduate outcomes that are projected as a consequence of the educational experiences.

Such an evaluation needs to be systematic and referenced to clearly defined criteria which address wide ranging factors that influence the standard of engineering graduate outcomes. An outcomes- based evaluation will require a holistic judgment of overall performance against the accreditation criteria.

Many of the elements of the evaluation will be subjective in nature. By definition, the process cannot be distilled down to simple objective measures testing compliance against prescribed

requirement thresholds. The task is to consider inputs and processes as well as some outcome observations as collective data for predicting the satisfactory attainment of prescribed graduate outcomes.

A core requirement is for the engineering education provider, to establish the engineering program objectives and to develop a specification of targeted graduate outcomes, covering generic and discipline specific capabilities, knowledge, skills, attributes and values for each program under consideration. The determination of this specification should be undertaken in conjunction with industry stakeholders and should drive the engineering educational design phase, where the learning outcomes from individual activities or program modules systematically aggregate to deliver the targeted graduate outcomes. Individual assessment tasks undertaken throughout the study program need to systematically map against the delivery of the individual elements within the engineering graduate outcomes specification. This then provides a fundamental reference for systematically tracking attainment of outcomes in each individual engineering graduate.

The publication of clear accreditation criteria is an essential foundation for an outcomes-based accreditation system. The criteria must evaluate, rather than prescribe – curriculum, educational methodology, policies, processes and practices. The criteria must be widely understood, be evident from first principles, informed by stakeholders and maintained against international benchmarks. There must be an underlying quality cycle to ensure consistency and fairness, as well as closure of the loop on accreditation processes and practices. Evaluation processes must be documented and auditable.

Engineering educational providers must be required to have in place their own systems for educational development, industry engagement, determining performance measures and for continuing quality improvement.

The accreditation criteria must identify the key factors that will influence the delivery of appropriate engineering graduate outcomes. An engineering graduate outcomes benchmark reference is the key basis for the criteria and provides a generic template for engineering educational providers to establish the detailed, customised specification of engineering graduate outcomes that underpin each individual program.

Outcomes-based accreditation criteria accommodate innovation and diversity in educational design and in learning and assessment processes, but ensure engineering graduates are equipped with a comprehensive specification of knowledge, capabilities, attributes, skills and values.

Accreditation criteria must under all circumstances embrace:

- the educational environment;
- the program outcomes specification, educational design, structure, content and assessment processes;
- the underpinning quality systems.

FEIAP has published FEIAP Engineering Education Accreditation System Model Criteria as a resource for member economies embarking on the development of an outcome based accreditation system. This model will include sample performance indicators and guideline material.

As a guide, the three aspects of the accreditation criteria could contain elements such as those listed below.

EDUCATIONAL ENVIRONMENT:

- Organisational and management structure – commitment to engineering education;
- faculty and support staff profile;
- Academic leadership and educational culture; faculty engagement with outcomes-based educational design and delivery;
- Facilities and physical resources;
- Funding model;
- Strategic management of student profile.

PROGRAM DESIGN, STRUCTURE, CONTENT AND ASSESSMENT PROCESSES:

- Specification of program objectives and educational outcomes and compatibility with the graduate outcomes benchmark reference template defined within the accreditation system;
- Program title consistent with objectives and designated graduate outcomes;
- Mapping of learning design and assessment processes against delivery of specified graduate outcomes;

- Compliance with any program structural requirements or discipline specific templates;
- Tracking individual student performance against graduate outcomes;
- Exposure of students to professional engineering practice.

QUALITY SYSTEMS:

- Quality Policy ensuring commitment to the Quality Systems;
- Engagement with external constituencies – input to setting reviewing and assessing attainment of graduate outcomes;
- Feedback and stakeholder input to continuous improvement cycle;
- Processes for setting and reviewing objectives and the graduate outcomes specification;
- Approach to educational design and review;
- Approach to assessment and performance evaluation;
- Benchmarking practices;
- Governance processes and structure;
- Student administration systems.

1.3 Accreditation Process

The Engineering Education Accreditation Body must publish appropriate policies and procedures to provide clear and sufficient information as guidance for engineering programs seeking accreditation. These policies and procedures should include at least the following elements:

(1) Documents to be provided by engineering programs

The Engineering Education Accreditation Body must require engineering programs seeking accreditation to conduct and a full self-review process and submit a report documenting outcomes of the self-review. The self-review process must answer whether the engineering program fulfils requirements set out by the accreditation body. Specifically, the engineering program must provide sufficient evidence, through appropriate and diverse assessment means, to

demonstrate that it fulfils the accreditation body's requirement on engineering graduate outcomes. The accreditation team will deliver preliminary findings from reviewing the report and verify their findings through the accreditation visit.

(2) Composition of accreditation team

The engineering education accreditation team should consist of at least two persons, preferably more, representing a balance of relevant experience and expertise as well as employment orientation, academics or industry. All members of the accreditation must be sufficiently trained and competent for conducting the review process. Conflict of interest is a critical issue in the accreditation process and must be taken into account in assembling the engineering education accreditation team. Each member of the accreditation team must submit a statement indicating partiality prior to his/her nomination.

(3) Duration of accreditation visit

The engineering education accreditation visit should last at least two days to allow sufficient time for documentation review and the interviews.

(4) Structure of the accreditation visit

The engineering education accreditation visit should include the following elements:

1. Preliminary meeting of the accreditation team prior to the visit to identify what information is to be obtained during the visit;
2. Meeting with educational institution's administrators;
3. Meeting with head of engineering program;
4. Meeting with academic staff members;
5. Meeting with support staff members;
6. Meeting with students;
7. Meeting with alumni;
8. Meeting with employers/industry/professional engineering organisation's representatives;
9. Visit of facilities;

10. Review of engineering project work, final papers and other documents (with regard to the standards and modes of assessment as well as to the learning outcomes of the students);

11. Feedback of the accreditation team at the end of the visit.

(5) Verification and validation of the report by the accreditation agency/commission

The engineering education accreditation body must provide a written report to the engineering program at the conclusion of the accreditation process. This report should state clearly the findings of the accreditation team in terms of concerns, weakness, and deficiency of the engineering education program. This information will not only support the delivery of accreditation decision but also directions for continuous improvement of the engineering education program.

(6) Decision on accreditation

The engineering education accreditation body must have a fair process to deliver accreditation decisions. The decision-making process needs to be transparent and those who are involved in the process must make informed decisions based on findings of the accreditation teams. The accreditation decision must clearly define the period of validity (the duration of which should not exceed a maximum of six years) and whether it refers to year of entry or year of graduation. After the limited validity of the accreditation has expired, the program must be submitted for re-accreditation. The accreditation decisions must be communicated clearly in written statement to the program.

(7) Publication of accreditation decisions

The engineering education accreditation body must make the accreditation decisions available to the public, normally through publishing list of accredited engineering education programs on its website or on printed materials. Engineering education programs fail to received accredited status are normally not published.

(8) Procedures of appeals

The engineering education accreditation body must have policies and procedures of appeals to ensure the rights of the engineering programs seeking accreditation when error in facts and/or error in procedures happen which causes the engineering programs receive unfavourable decisions. Appropriate conflict of interest procedures must be considered during the appeal process.

1.4 Governance of the Accreditation Body

(1) Official Status

The engineering education accreditation body must be authorities, agencies or institutions which are representative of the engineering community and which have statutory powers or recognised professional authority for accrediting engineering programs designed to satisfy the academic requirements for admission to practicing status (e.g. licensing, registration or certification) within a defined economy (e.g. country, jurisdiction, geographical region).

(2) Mission Statement

The engineering education accreditation body must have clear and explicit goals and objectives for its work, contained in a publicly available statement. Specifically, the statement should declare that the accreditation process is a major activity of the engineering education accreditation body and that there exists a systematic approach to achieving its goals and objectives.

(3) Activities

The engineering education accreditation body must undertake the accreditation activities (at program level) on a regular basis. It should declare the career categories associated with programs/qualifications (Engineer) and disciplines that are recognised (electrical, civil, chemical, mechanical, etc.) as well as geographical bounds of accreditation activities. The engineering education accreditation body should also have effective process for the recruitment, selection, training & evaluation of program evaluators.

(4) Resources

The engineering education accreditation body must have adequate and proportional resources, both human and financial, to enable planning, operation and development of the entire engineering education accreditation activities in an effective and efficient manner.

(5) Leadership and Management

The engineering education accreditation body must have sustainable leadership and management structure to provide confidence and accountability of its accreditation activities. Individuals who hold leadership and management roles must possess credentials and expertise in relevant

disciplines. The engineering education accreditation body should exercise in accordance with appropriate governance policies during leadership and management changes to enable stability at all times.

(6) Independence

The engineering education accreditation body must be independent to the extent both that they have autonomous responsibility for its operations and that the accreditation decisions it made cannot be influenced by third parties such as higher education institutions, ministries, legislatures, or other stakeholders.

(7) Accountability and Integrity

The engineering education accreditation body should have in place procedures for its own accountability and to maintain its integrity. These procedures enable the engineering education accreditation body to operate at all times in accordance with high standards of professionalism, ethics, and objectivity. Specifically,

1. The engineering education accreditation body has in place, and enforces, a non-conflict-of-interest mechanism that governs the work of its staff and its evaluators;
2. The engineering education accreditation body has in place internal quality assurance procedures which include an internal feedback mechanism (i.e. means to collect feedback from its own staff and council/board); an internal reflection mechanism (i.e. means to react to internal and external recommendations for improvement); and an external feedback mechanism (i.e. means to collect feedback from experts and reviewed institutions for future development) in order to inform and underpin its own development and improvement.
3. A mandatory cyclical external review of the agency's activities at least once every five or six years.

Appendix I

Myanmar Engineering Council

Engineering Education Accreditation Committee

Template for Exit Statement

University _____

Program _____

Convener

Name Date

_____

Team Chair

Name Date

_____

Program Evaluator

Name Date

_____

Program Evaluator

Name Date

_____

【Bachelor's Program: EEAC 2020】

Criterion 1: Program Educational Objectives

This criterion assesses the program educational objectives (PEOs) and the validity of such objectives. The program seeking accreditation must:

1.1 publish detailed PEOs that demonstrate the program's characteristics and relevance to the contemporary trends and societal demands;

1.2 describe the relationship between the PEOs of the program and those of the institution, as well as the process of establishing these objectives;

1.3 describe the manner in which the design of the curriculum is consistent with the PEOs;

1.4 institutionalize an effective assessment process to assure the achievement of the PEOs.

Strength:

#	Criterion	Statement
1		
2		
3		

Area for Improvement:

#	Criterion	Statement
1		
2		
3		

Criterion 2: Graduate Attributes (GAs)

This criterion assesses the graduate attributes. The program must demonstrate that students have attained the following outcomes by graduation:

2.1 ability to innovate and apply knowledge of computing and mathematics appropriate to the discipline;

2.2 ability to apply techniques, skills, and modern tools necessary for computing practice;

2.3 ability to design a computer-based system, process, component, or program;

2.4 ability to manage project (including cost analysis), communicate effectively, and function on interdisciplinary teams;

2.5 ability to identify, formulate, research literature and analyze complex computing problems reaching substantial conclusions;

2.6 knowledge of contemporary issues; an understanding of the impact of computing in an environmental, societal, and global context; and the ability and habit to engage in life-long learning; 3.7 understand and committed to professional ethics and knowledge of social responsibilities with respect to diversity.

Strength:

#	Criterion	Statement
1		
2		
3		

Area for Improvement:

#	Criterion	Statement
1		
2		
3		

Criterion 3: Academic Curriculum

This criterion assesses the curriculum of the program:

3.1 Design and contents of the curriculum must be consistent with the PEOs, and the program must demonstrate through transcript analysis that coursework of each graduate includes the following three major components: mathematics, technical and professional computing component, and general education. Specifically:

3.1.1 mathematics appropriate to the discipline must be consistent with the PEOs and must account for at least 9 credits required for graduation;

3.1.2 technical and professional computing component must account for at least three eighths of the credits required for graduation including capstone design course;

3.1.3 general education component must complement the technical contents of the discipline and be consistent with the PEOs.

3.2 Design and implementation of the curriculum must correlate the development of the industry and prepare students to culminate the learned knowledge and skills in computing practice.

Strength:

#	Criterion	Statement
1		
2		
3		

Area for Improvement:

#	Criterion	Statement
1		
2		
3		

Criterion 4: Students

This criterion assesses the quality of education for students and capacity of the graduates. The program seeking accreditation must:

4.1 have appropriate regulations that are consistent with the PEOs;

4.2 have measures and policies encouraging students to engage in academic exchange and related learning activities;

4.3 institutionalize an effective advising and assessment system.

Strength:

#	Criterion	Statement
1		
2		
3		

Area for Improvement:

#	Criterion	Statement
1		
2		
3		

Criterion 5: Academic and Support Staff

This criterion assesses the faculty of the program with regard to the following:

5.1 The full-time faculty must be of sufficient number;

5.2 The faculty must be involved in the formation and execution process of the PEOs;

5.3 The faculty must have the qualification and competencies to cover the professional knowledge of the subject areas in which they teach;

5.4 The program must demonstrate the effectiveness of faculty-student interactions and student advising;

5.5 The program must demonstrate the effectiveness of interactions of faculty with industry;

5.6 The program must provide the faculty with appropriate channels and incentives for professional growth and development;

5.7 The faculty must participate in relevant academic and professional organizations and activities.

Strength:

#	Criterion	Statement
1		
2		
3		

Area for Improvement:

#	Criterion	Statement
1		
2		
3		

Criterion 6: Facilities

This criterion assesses instructional facilities, space, and hard and software:

6.1 The program must provide an environment to foster effective faculty-student interaction;

6.2 The program must provide an environment to support the development of professional knowledge and skills of students;

6.3 The program must provide enough opportunities and guidance for students to learn the use of specialized equipment and tools;

6.4 Computing and information infrastructure must be in place to support the teaching activities of the program;

6.5 The program must provide a safe learning environment and have appropriate system in place to maintain, upgrade, and manage these facilities.

Strength:

#	Criterion	Statement
1		
2		
3		

Area for Improvement:

#	Criterion	Statement
1		
2		
3		

Criterion 7: Quality Management System

Institutional Support and Financial Resources

This criterion assesses the institutional support and financial resources of the program:

7.1 The institution must provide adequate support and financial resources to assure the quality and continuity of the program, along with constructive leadership and management;

7.2 Resources must be sufficient to support the ongoing professional development of the faculty;

7.3 Administrative personnel and technical staff must be adequate to meet the program's needs;

7.4 Financial resources must be sufficient to acquire, maintain, and operate the facilities, infrastructure, and equipment appropriate for the program to support educational needs.

Strength:

#	Criterion	Statement
1		
2		
3		

Area for Improvement:

#	Criterion	Statement
1		
2		
3		

Appendix I

Myanmar Engineering Council

Engineering Education Accreditation Committee

Template for Accreditation Action

University _____

Program _____

Convener

Name Date _____

Accreditation Action

University :

Programme :

Accrediting Year :

Accreditation Criteria : 2020 EEAC Accreditation Manual

Program Evaluator

Name	Position
	Convener
	Team Chair
	Programme Evaluator 1
	Programme Evaluator 1

Important Date

Deadline for Self-study Report	Date of On-site Visit	Date of Exit Statement	Deadline for Response to Exit Statement	Accreditation Action Decision Meeting
2020/7/31	2020/XX/XX~XX	2020/XX/XX	NA	2021/1/25~31

Accreditation Action

Programme	Accreditation Action	Accredited Period
Programme 1	Accredited/Interim Review Needed	# of Years (From 20XX/8/1 to 20XX/7/31)
Programme 2	Accredited/Interim Review Needed	# of Years (From 20XX/8/1 to 20XX/7/31)

Next Review

Program	Review Type	Review Year	Contents of the Review
Program 1	Interim	20XX	1. Results of continuous improvement mechanism. 2. Improvements made on the weaknesses identified from the last review (please refer to the contents of the Accreditation Statement and the Interim Review Self-study Report.) 3. The Interim Review Self-study Report is due on 20XX/7/31. IEET will carry out the interim review in 20XX. 4. Accredited program and program pending for accreditation action must submit annual accreditation information online using AMS. The information will be used for the next review.
Program 2	General	20XX	1. Results of continuous improvement mechanism. 2. The Interim Review Self-study Report is due on 20XX/7/31. IEET will carry out the interim review in 20XX. 3. Accredited program and program pending for accreditation action must submit annual accreditation information online using AMS. The information will be used for the next review.