MYANMAR ENGINEERING COUNCIL

ENGINEERING ACCREDITATION COMMITTEE

ACCREDITATION MANUAL

(January 2015)

DRAFT

TABLE OF CONTENTS

DRAFT

DRAFT

ABBREVIATION

EAC	-	Engineering Accreditation Committee
M.Eng.C.	-	Myanmar Engineering Council
CQI	-	Continual Quality Improvement
OBE	-	Outcome-Based Education
CEC	-	Central Executives Committee
EAD	-	Engineering Accreditation Department
NGR	-	Next General Review
IR	-	Interim Report
IV	-	Interim Visit
SCR	-	Show Case Report
SCV	-	Show Case Visit
VE	-	Visit Extended
SE	-	Show Case Extended
NA	-	Not to Accredit

DRAFT

1.0 Introduction

The Myanmar Engineering Council (M.Eng.C.) registers graduates and professional engineers under the Myanmar Engineering Council Law (2013 November). 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 programmes in engineering due to the growing number of students seeking assurance on the standards of programmes being offered by Technological Universities and the emergence of more technological institutions providing education in engineering.

The Engineering Accreditation Committee (EAC) 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 Technological Institutions 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 Accreditation Committee

The Engineering Accreditation Committee (EAC), representing M.Eng.C. shall be an independent body for the accreditation of engineering programmes. The members of EAC shall be appointed by M.Eng.C. President in consultation with the council members for a period of four years in accordance with the 13 members nominated by M.Eng.C. The EAC Chair is elected by the M.Eng.C. members and shall hold office for the duration of his appointment as EAC chair.

Members of EAC shall be appointed by M.Eng.C. as follows:

a) A Chairman (elected by M.Eng.C.)

b) 12 members representing each of major branches (e.g. Civil, Mechanical, Electrical, Chemical and Electronics) and each of the constituent organizations nominated by M.Eng.C.

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

The final decision on the membership of the EAC is with the M.Eng.C . All members shall be professional engineers.

The terms of reference of EAC are:

(i) to implement the accreditation policy of the M.Eng.C;

(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 M.Eng.C. on complaints and appeals regarding the accreditation process;

(vi) to represent M.Eng.C. in mutual recognition agreements on academic qualifications and professional membership with other countries;

(vii) to report periodically to the M.Eng.C. on its work.

DRAFT

3.0 Accreditation Objective

The objectives of accreditation are

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

(ii) to provide feedback to the Technological Universities/Institutions for the improvement and development of educational programmes in engineering that can better meet the needs of the local industry

(iii) to ensure that Continual Quality Improvement (CQI) is being practiced by Technological Universities/Institutions

Accreditation may also serve as a tool to benchmark engineering programmes.

4.0 Programme Objectives

Programme Objectives are particular goals consistent with the mission and vision of the Technological Universities/Institutions, are responsive to the expressed interest of programme stakeholders, and describe the expected achievements of graduates in their career and professional life a few years after graduation.

An engineering programme seeking accreditation shall respond to the following requirements:

(i) **Programme Objectives:** The programme shall have published Programme Objectives.

(ii) **Processes and Results:** The programme shall have a clear linkage between Programme Objectives and Learning Outcomes (Section 4.0); a process of ongoing assessment and evaluation that demonstrates the achievement of Programme Objectives with documented results; and evaluation results that are used in the continual improvement of the programme.

(iii) **Stakeholders Involvement:** The Technological Universities/Institutions shall provide *evidence of stakeholder involvement with regard to (i) and (ii) above.*

5.0 Learning Outcomes

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

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

(i) **Learning Outcomes:** The Technological Institutions shall have published Learning Outcomes that have been formulated.

(ii) **Processes and Results:** The Various Learning Outcomes shall be considered in designing the curriculum. In addition, a process of measuring, assessing and evaluating the degree of achievement of the students shall be established. The results of this assessment process shall be applied for continual improvement of the programme.

(iii) **Stakeholders Involvement:** The Technological Institutions shall provide evidence of stakeholder involvement.

6.0 Accreditation Policy

Accreditation will be considered upon a written request from Technological Universities/Institutions.

DRAFT

6.1 Accreditation Process

Accreditation of engineering programmes is undertaken by the EAC at the request of the Technological Universities/Institutions. The EAC's accreditation process will focus on outcomes and the internal systems 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 enter engineering practice.

6.2 The Accreditation Cycle

Accreditation is accorded to a programme for a maximum period of five years. The Technological Universities/Institutions shall apply for re-accreditation not less than six months before the expiry of the accreditation period.

6.3 Programmes

Technological Universities/Institutions may offer programme/s via various modes and at different locations, such as full-time, part-time, joint degree, multi campus etc. For each of the programmes, the Technological Universities/Institutions shall apply for accreditation separately.

A programme shall be evaluated based on the criteria stipulated in Section.8 of this Manual.

6.4 Application and Preparation for Accreditation Visit

Technological Universities/Institutions should make an application for programme accreditation as per the requirements of Section 9 of the Manual to EAC.

If the documents submitted are found to be inadequate, the Technological Universities/Institutions shall be required to provide further information before an accreditation visit can be scheduled. The application will be deemed to have been withdrawn if further information is not submitted within a period of 3 months upon request.

6.5 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 Panel appointed by EAC.

6.6 Accreditation Decision

Upon completion of the programme accreditation, the EAC, based on the recommendation of the Evaluation Panel, may decide on the graduating cohort's one of the following:

(i) To accord accreditation for five years.
(ii) To accord accreditation for less than five years.
(iii) To accord provisionally for newly established programs.
(iV) To decline accreditation. In such a case, a further application will normally not be considered within the next one year.

A programme that has major shortcoming(s) is accorded less than five years accreditation. The Technological Universities/Institutions shall take appropriate actions to remedy the shortcoming(s), and submit evidence of such corrective action(s). If this is adjudged satisfactory, the remaining period of the accreditation may be accorded by the EAC. A further visit will be scheduled to verify the results of the remedial action(s), if deemed unnecessary. Failure to address the shortcoming(s) may result in cessation of accreditation at the end of the stated period.

The EAC may defer its decision on accreditation under certain circumstances to allow the

Technological Universities/Institutions to fulfil condition(s) that may be imposed by the EAC.
The EAC decision shall be sent to the Technological Universities/Institutions, with copies to member of EAC. The accreditation shall be accorded to a specific programme, location and mode.

6.7 Revisions to an Accredited Programme

The Technological Universities/Institutions shall advise the EAC of any changes made to an accredited programme. Failure to do so may cause the EAC to withdraw the accreditation. The EAC may then direct the Technological Universities/Institutions to apply for re-accreditation of the revised programme.

6.8 The Approval to Conduct a Programme

The Technological Universities/Institutions intending to conduct a new programme shall obtain approval from the relevant authorities.
The Technological Universities/Institutions should submit the complete set of documents as specified in Section 9 of this Manual to the EAC for programme evaluation. The recommendation from EAC shall be forwarded to the relevant authorities.
When the documents are considered to be inadequate, the Technological Universities/Institutions shall be required to provide further information before an evaluation is carried out. If the required information is not provided within a period of 3 months, it shall be deemed that the Technological Universities/Institutions no longer intends to conduct the programme.

6.9 Publication of Accreditation Status

EAC shall regularly update the list of accredited programmes.

6.10 Appeal Procedures

Technological Universities/Institutions may appeal against a decision made by EAC. The notice of appeal must be made in writing to the Accreditation Appeals Board within 2 weeks upon receiving the decision, stating the basis of the appeal. Appeal documents are to be submitted within **4** weeks after the above notice of appeal.
The Appeals Board shall consist of M.Eng.C. President, EAC Chair and Rectors of Technological Universities/Institutions or their nominated representatives. The President of M.Eng.C. or his 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 Technological Universities/Institutions.
The decision of the Appeals Board shall be forwarded to the Technological Universities/Institutions within 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 M.Eng.C. within 30 days 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 M.Eng.C.'s published criteria, policies, or procedures.

DRAFT

Upon receipt of a notice of appeal, the President of M.Eng.C. will notify the M.Eng.C. Board of the appeal and will select three or more members or past members of the M.Eng.C., Executives Committee (EC) to serve as an appeal committee. Current members of the M.Eng.C. 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 M.Eng.C. 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 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 M.Eng.C. Central Executives Committee (CEC), 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 M.Eng.C. Executives Committee (EC) in writing by the appeal committee chair. The decision rendered by the appeal committee is the final decision of M.Eng.C.

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.

6.11 Confidentiality

Documents or other information obtained by the Evaluation Panel, Engineering Accreditation Department (EAD) staff, and EAC members in connection with the accreditation exercise shall be treated as confidential.

6.12 Expenses

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

DRAFT

6.13 Conflict of Interest

Members of the EAC, Evaluation Panels, Appeals Board and M.Eng.C. 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.

Service as a M.Eng.C. board member or alternate, committee member, committee member or alternate, team chair, program evaluator, accreditation consultant, or staff member creates situations that may result in conflicts of interest or questions regarding the objectivity and credibility of the accreditation process. M.Eng.C. expects these individuals to behave in a professional and ethical manner, to disclose real or perceived conflicts of interest, and to reuse themselves from discussions or decisions related to real or perceived conflicts of interest. The intent of this policy is to:

(i) Maintain credibility in the accreditation process and confidence in the decisions of the Excutives Committee (EC), committee members, committee team chairs, program evaluators, consultants and staff members;
(ii) Assure fairness and impartiality in decision-making; and
(iii) Avoid the appearance of impropriety.

Individuals representing M.Eng.C. must not participate in any decision-making capacity if they have of have had a close and active association with a program or institution that is being considered for official action by M.Eng.C. Close and active association includes, but is not limited to:

(i) Current or past employment as faculty, staff, of consultant by the institution or program;
(ii) Current or past discussion or negotiation of employment with the institution or program;
(iii) Attendance as a student at the institution;
(iv) Receipt of an honorary degree from the institution;
(v) Involvement of close family relative as a student or employee of the institution or program;
(vi) An unpaid official relationship with an institution, e.g., membership on the institution's board of trustees or industry advisory board; or
(vii) Any reason that prohibits individual from rendering an unbiased decision.

Committee members are not eligible to serve concurrently on the Executives Committee (EC); nor are members of the Executives Committee (EC) eligible to serve on a M.Eng.C. committee. Members of the M.Eng.C. Executives Committee (EC) and M.Eng.C. staff members may observe and accreditation visit, but they are not eligible to serve as program evaluators or team chairs.

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 M.Eng.C. must sign a conflict of interest and confidentiality statement indicating that she/he has read and understands M.Eng.C. 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 recuse themselves from any portion of a M.Eng.C. meeting involving discussions or decisions for which they have a real or perceived conflict of interest.

DRAFT

M.Eng.C. will maintain a record of the names of individuals recusing themselves for conflicts of interest at each meeting related to accreditation decision making.

7.0 Accreditation Procedure

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

7.1 Application for Accreditation

The Technological Universities/Institutions should make an application for programme accreditation as per the requirements of Section 9 of the Manual to EAC.

For a new programme, the Technological Universities/Institutions should apply for accreditation at least **6 months** before the final examination of the first intake of students.

For a current accredited programme, the Technological Institutions should apply for re-accreditation at least **6 months** before the expiry date of the accreditation.

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

7.2 Appointment of Evaluation Panel

On submission of all required documents, an Evaluation Panel shall be appointed .Members of the Evaluation Panel are selected on the basis of their expertise and standing in a particular discipline of engineering. Representatives from both the industry and academia are appointed because of the perspective and experience that each area of endeavour can bring to the assessment of a programme, and to the maintenance of high professional standards. The EAC needs to ensure that not only high standards of academic teaching and achievement are being met, but also that the skills acquired and quality of graduates, are relevant to the practices and continued development of engineering.

The Evaluation Panel needs to be aware of EAC policies on accreditation as outlined in Section 6 of this Manual. The Evaluation Panel will assess all the accreditation criteria set forth in this Manual. The assessment includes the auditing and confirmation of documents submitted by the Technological Institutions.

7.3 Scheduling of a Visit

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

7.4 Pre-Accreditation Visit Meeting

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

DRAFT

7.5 Accreditation Visit

The accreditation visit will normally be scheduled for a period of two days. The overall conduct of the visit shall be managed by the EAC. The visit shall include but not be limited to the following:

(a) Opening meeting with the programme administrators
(b) Meeting with staff members
(c) Meeting with students
(d) Meeting with external stakeholders such as alumni, employers, and industry advisor
(e) Visiting and checking of facilities
(f) Checking relevant documents
(g) Exit meeting with programme administrators

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

7.6 Report and Recommendation

The report from the Evaluation Panel shall be submitted to the EAC within 4 weeks after the visit.

8.0 Qualifying Requirements and Accreditation Criteria

An engineering programme shall be assessed by EAC to enable graduates of the programme to register as graduate engineers with the M.Eng.C. The assessment involves a review of qualifying requirements of the Technological Institutions and an evaluation based on the following criteria, apart from Programme Objectives (4.0) and Learning Outcomes (5.0):

Criterion 1 - Academic Curriculum
Criterion 2 - Students
Criterion 3 - Academic and Support Staff
Criterion 4 - Facilities
Criterion 5 - 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 8 components of the qualifying requirements and each programme is expected to have all the components. These components are:

1. A minimum of 120 credit hours of which 80 credit hours must be core engineering courses offered over a period of four years(It means 3rd,4th,5th,6th).
2. Final year project (minimum 6 credit hours)
3. Industrial training (minimum of 8 weeks)
4. Full-time academic staff (minimum of 8)
5. Staff: student ratio 1: 20 or better
6. External examiner's report (minimum of two reports over five years)
7. Programme Objectives
8. Learning Outcomes

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.

DRAFT

8.1 Criterion 1: 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 Learning Outcomes.

A balanced curriculum shall include all technical and non-technical attributes listed in the Learning Outcomes, 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 EAC.

All engineering programmes need to cover the broad areas of their respective disciplines. 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 present 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. Technological Institutions 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 planned and incorporated within the curriculum to enable students to effectively develop the range of intellectual and practical skills, as well as positive attitudes as required in the Learning Outcomes. The assessment to evaluate the degree of the achievement of the Learning Outcomes by the students shall be done both at the programme as well as at course levels. The teaching-learning methods shall enable students to take full responsibility for their own learning and prepare them for life-long learning. The programme shall demonstrate the relationship between the courses and the Learning Outcomes.

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.

If the academic programme includes credit system, the institution shall comply the following:

The academic programme component must consist of a minimum total of **120 credit hours** (not including credits for remedial courses) made up as follows:

(a) A **minimum of 80 credit hours** shall be **engineering courses** consisting of engineering sciences and engineering design/projects appropriate to the student's field of study.

(b) The **remaining credit hours** 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

DRAFT

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. The curriculum shall include sufficient elements for training students in rational thinking and research methods.

The curriculum content should cover the following:

(i) Engineering mathematics, science, engineering principles, skills and tools (computing, experimentation) appropriate to the discipline of study
(ii) Engineering applications – projects
(iii) Integrated exposure to professional engineering practice, including management
(iv) Laboratory work to complement the science, computing and engineering theory;
(v) Industrial training -exposure to professional engineering practice in an engineering-practice environment;
(vi) Exposure to engineering practice;
(vii) Relevant tutorial classes to complement the lectures; and
(viii) Final year project

Credit hours

For a 16-week semester (not including examination or mid-term break), one credit hour is defined as:

- One hour per week of lecture (additional independent study of two hours is assumed to have been included).
- Two hours per week of laboratory or workshop lecture (additional independent learning time of one hour is assumed to have been included).
- Two hours per week of supervised and compulsory tutorial session (additional independent learning time of one hour is assumed to have been included), subject to a maximum of one credit hour for each course in that semester.
- Three hours per week of facilitated activities involving other modes of delivery such as problem-based learning, e-learning modules, site visits, discovery learning, integrated design and coursework projects.
- Three hours per week of activities involving final year project inclusive of meeting with supervisor.

For industrial training, the following guideline shall be followed:

- Industrial training shall be for a minimum of 8 weeks of continuous training. **One** credit hour is allocated for every two weeks of training subject to a maximum of **six** credit hours. The training shall be adequately structured, supervised and recorded in log books/report. The industrial training must be conducted before the final semester.

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

- A final year project is subject to a minimum of six credit hours and a maximum of twelve credit hours.

Technological Institutions may use their version of the credit hours; however they must provide the equivalency according to the EAC's definition of credit hours.

8.2 Criterion 2: Students

The quality and performance of students, in relation to the Learning Outcomes is of utmost importance

DRAFT

in the evaluation of an engineering programme.
Students intending to pursue engineering programmes shall have a good understanding of mathematics and physical sciences.

Technological Institutions shall ensure that students, who do not meet the above criteria, undertake suitable remedial programmes in order to attain the equivalent entry qualification. Technological Institutions must put in place the mechanism for credit transfer/credit exemption to allow alternative educational pathways.

The programme shall provide the necessary teaching-learning environment to support the achievement of the Programme Objectives and Learning Outcomes. The teaching-learning environment shall be conducive to ensure that students are always enthusiastic and motivated. The Technological Institutions shall provide necessary counselling services to students regarding academic, career, financial, and health matters.
Students shall not be over burdened with workload that may be beyond their ability to cope with. Adequate opportunities, such as involvement in co-curricular activities in student clubs, sports and campus activities, shall be provided for students to develop their character apart from academic development.

8.3 Criterion 3: 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. Technological Institutions may engage part-time staff with acceptable professional qualifications in the related engineering fields. The full-time equivalent of part-time staff shall not exceed 40%.
Academic staff shall have postgraduate degrees (Masters level or higher). However, a staff member with a good first degree and wide industrial/specialist experience with acceptable professional qualifications may be considered.

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 or as Corporate Members of Learned Bodies. The Technological Institutions 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, Technological Institutions 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.

8.4 Criterion 4: Facilities

The quality of the environment in which the programme is delivered is regarded as key 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), laboratories and workshops, and associate equipment to cater for multi-delivery modes.
Technological Institutions must ensure that all facilities are maintained and adhered to best practices

in safety, health and environment where appropriate.

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

8.5 Criterion 5: Quality Management Systems

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

8.5.1 Institutional Support, Operating Environment, and Financial Resources

The Technological Institutions must regard quality engineering education as a significant and long-term component of its activity. This would most commonly be reflected in the Technological Institutions' 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 Technological Institutions 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 Technological Institutions 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 Technological Institutions must have sufficient financial resources to acquire, maintain, and operate facilities and equipment appropriate for the engineering programme.

8.5.2 Programme Quality Management and Planning

The Technological Institutions' processes for programme planning, curriculum development, and regular curriculum and content review must involve all academic staff. The processes include reviewing Programme Objectives and Learning Outcomes, tracking the contributions of individual courses to the Learning Outcomes, tracking performance assessment processes, the comments from External Examiners, reviewing feedback and inputs from stakeholders including students and alumni. The process of continual quality improvement shall be implemented with full accountability. For a new programme, the processes surrounding the decision to introduce the programme should be established.

8.5.3 External Assessment and Advisory System

The Technological Institutions shall have an external examiner for programme to independently review the overall academic standard.

DRAFT

The external examiner is expected to carry out the overall assessment of the programme including staff as well as all courses and laboratory work undertaken by the students. Assessment is to be made at least twice during the 5-year accreditation cycle, preferably once during the initial period of the accreditation cycle and another before the next accreditation visit.

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

8.5.4 Quality Assurance

A quality management system must be in place to assure the achievement of Learning Outcomes. The Technological Institutions 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 but not limited to:

(a) Student admission
(b) Teaching and learning
(c) Assessment and evaluation which include:
    i. examination regulations and criteria for pass/fail
    ii. preparation and moderation processes
    iii. level of assessment
    iv. assessment processes including final year project/industrial training

9.0 Accreditation Documents

9.1 Introduction

The Technological Institutions applying for accreditation 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 programme to be accredited, unless otherwise stated, the Technological Institutions shall submit the following documents:

i. Self-Assessment Report (as noted in Section 9.2 of this Manual) –Hardcopy
ii. Supporting Material Document (as noted in Section 9.3 of this Manual) – Digital format including details of the syllabus.
iii. Appendix (Checklist of Documents for Accreditation/Approval of New Programme and Relevant Information)

Institutional Documents and Additional Documentation (as noted in Section 9.4) are to be made available during the visit.

9.2 Self-Assessment Report – Hardcopy

A Self-Assessment Report is an account of the Technological Institutions' 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 appropriately bound document, ranging between 50 – 100 pages with all pages numbered and a table of contents, shall provide the information and description about the programme to enable the Evaluation Panel to objectively assess the programme for the purpose of accreditation or approval.

DRAFT

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 Technological Institutions' programme.

The submission must be comprehensive, easily readable, free standing, and provide a coherent overview with the text addressing each major point in a definitive manner. It must be concise but in 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 leave the EAC to find the relevant information. The Technological Institutions is advised to provide accurate information as required by the Accreditation Manual, since the Evaluation Panel will verify the information during the visit.

9.2.1 General Information

i. Provide general information on the Technological Institutions 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.

9.2.2 Programme Objectives

i. State the vision and mission of the Technological Institutions.
ii. Describe the Programme Objectives and state where they are published.
iii. Describe how the Programme Objectives are consistent with the vision and mission of the Technological Institutions and stakeholder requirements.
iv. Describe the processes used to establish and review the Programme Objectives, and the extent to which the programme's various stakeholders are involved in these processes.
v. Describe how the Technological Institutions ensures achievement of the Programme Objectives.
vi. Describe the ongoing evaluation of the level of achievement of these objectives, and the extent to which the programme's various stakeholders are involved in these processes.
vii. Describe how the results obtained from evaluation are being used to improve the effectiveness of the programme.

9.2.3 Learning Outcomes

i. List down the Learning Outcomes and state where are they published.
ii. Describe how the Learning Outcomes relate to the Programme Objectives.
iii. Describe the processes used to establish and review the Learning Outcomes, and the extent to which the programme's various stakeholders are involved in these processes.
iv. Describe the data gathered and explain the results of the assessment.
v. Explain how the assessment results are applied to further develop and improve the programme.
vi. Describe the materials, including student work and other tangible materials that demonstrate achievement of the Learning Outcomes.

DRAFT

9.2.4 Academic Curriculum

i. Discuss the programme structure and course contents to show how they are appropriate to, consistent with, and support the development of the range of intellectual and practical skills and attainment or achievement of the Learning Outcomes.
ii. Discuss the programme delivery and assessment methods and how these are appropriate to, consistent with, and support the development of the range of intellectual and practical skills and attainment or achievement of the Learning Outcomes.

iii. The information required in items (i) and (ii) should include but is not limited to the following:
- A matrix linking courses to Learning Outcomes to identify and track the contribution of each course to the Learning Outcomes.
- Distribution of the engineering courses according to areas specific to each programme.
- Distribution of the related non-engineering (general education) courses.

9.2.5 Students

i. Discuss students' performance in relation to Learning Outcomes.
ii. Discuss the requirement and process for admission of students to the programme.
iii. Discuss students' workload.
iv. Discuss students' activities and involvement in student organisations that provide experience in management and governance, representation in education and related matters and social activities.

9.2.6 Academic and Support Staff

i. Discuss the strength and competencies of the academic staff in covering all areas of the programme.
ii. Discuss how the overall staff workload enables effective teaching, student-staff interaction, student advising and counselling, Technological Institutions 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
    - An analysis of all academic staff
    - A summary of the academic qualifications of academic staff
    - A summary of the posts held by full time academic staff
    - A summary of teaching workload of academic staff for the current semester
    - An analysis of all support staff
    - A summary of the posts held by support staff
    - The staff: student ratio by year for all academic years for the past four years

9.2.7 Facilities

i. Discuss the adequacy of teaching and learning facilities such as classrooms, learning-support facilities, study areas, information resources (library), computing and information-technology systems, laboratories and workshops.
ii. 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

DRAFT

character building.

iii. The information required in items (i) to (ii) 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).

9.2.8 Quality Management System

i. Outline the organisational structure of the Technological Institutions as well as the structure within the faculty/department/programme. Discuss the level and adequacy of institutional support, operating environment, financial resources, constructive leadership, policies and mechanisms for attracting, appointing, retaining and rewarding well-qualified staff and provision of professional development, and provision of infrastructure and support services to achieve Programme Objectives and assure continuity 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 , course review and course monitoring; internal audit; management review meeting; ; responding to feedback and inputs from stakeholders including industry advisors, students and alumni; tracking the contribution of individual courses to the Learning Outcomes; tracking outcomes of performance through assessment; responding to External Examiners comments; reviewing of Programme Objectives and Learning Outcomes; and continual quality improvement. Where these are discussed elsewhere in the report, specify their locations.

iii. Summarise responses to the external examiner's report.

iv. Discuss how the quality management system of the Technological Institutions provides quality assurance and benchmarking.

v. The information required in items (i) to (iv) should be provided in the supporting document and is not limited to the following:
   - Evidence on the participation of academic staff, support staff and students in the continual quality improvement process.
   - Evidence on the development of academic staff through opportunities in further education, industrial exposure, as well as research and development.
   - Policies, internal processes and practices that are in place at all levels within the Technological Institutions relating to the five criteria as stated in Section 9 of this Manual.
   - Evidence of the on-going participation of industry advisors in discussions and forums, professional practice exposure, and collaborative projects.

9.2.9 Other Relevant Information

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

DRAFT

9.3 Supporting Material Document – Digital Format

This document is to provide supporting material for the programme in digital format (softcopy) as follows:

9.3.1 Supporting Information

Provide additional information on the Technological Institutions, faculty/school/department, and programme not provided in the Self-Assessment Report.

9.3.2 Academic and Laboratory Support Staff

Provide personal file and certificate for each staff member.

9.3.3 Programme Structure and Contents

Provide evidence of the use of tutorials and non-conventional delivery methods such as Problem Based Learning (PBL) techniques alongside traditional lectures. Provide a summary of industrial training schemes, and list of companies involved. Provide evidence of activities relevant to industry exposure.

9.3.4 Equipment, Software and Titles of Books and Journals

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.

9.3.5 External Examiner and Advisory Board

Provide the external examiner's reports and reports/minutes from advisory board meetings.

9.4 Institutional Documents and Additional Documentation to be Made Available during the Visit

The following items, which constitute evidence to support the information requested in Sections 9.2 and 9.3 shall be made available during the visit:

9.4.1 Technological Institutions Documents

Provide the Handbook, Calendar supplement, or other official publications relating to the faculty/school/department, and containing the statement of programme details; Technological Institutions brochure and any other documents that relate to the faculty/school/department, and programme.

9.4.2 Documents Related to Programme Objectives and Outcomes

Provide all relevant documents and evidence related to Programme Objectives and Learning Outcomes (one copy) as follows:

i. Course files – for every course offered by the programme, provide the course information to include the targeted course learning outcomes, course synopsis/syllabus, and a list of references (texts used). Final 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 (optional), and any other materials used for the course are also to be included. For laboratory courses, provide a copy of the syllabus, experiment instruction sheets, as well as supporting information.

DRAFT

ii. Objectives and outcomes assessment instruments – supporting documentation for objectives and outcomes assessment including sample questionnaires, portfolios, survey forms, video recordings, etc.
iii. All evidence related to Continual Quality Improvement of the programme.
iv. Other relevant documents (if any).

9.4.3 Final Project Reports

For a sample of students, provide a copy of the final project report, instruction sheets, and grade sheets or other means of evaluation for the project.
Provide the listing of final project titles for the past few years.

9.4.4 Industrial Training Reports

For a sample of students, provide a copy of the training reports, guidelines for the training, and reviews by the industry sponsors as well as the faculty mentors.

9.4.5 Laboratory Reports

For a sample of students, provide a copy of the laboratory reports, instruction sheets, and grade sheets or other means of evaluation for the project laboratory report.

9.4.6 Quality Assurance Records

Provide minutes and records of action and improvement of meetings of the programme teaching team, Industry Advisory Committee, and staff-student consultation forums.

9.4.7 Other Documentation

Provide any other documentation that might help the Evaluation Panel in the assessment of the Programme.

9.5 Accreditation Actions

The decision on program accreditation rests with the appropriate committee of M.Eng.C. The following actions are available to the committees. In the case where two or more committees are involved in the review of a single program, each committee determines an action independently. Normally, the more severe of the actions voted will be indicated as the action for the program.

NGR (Next General Review) - This action indicates that the program has no Deficiencies or Weaknesses. This action is taken only after a Comprehensive General Review and has typical duration of six years.

IR (Interim Report) - This action indicates that the program has one or more Weaknesses. The Weaknesses are such that progress report will be required to evaluate the remedial actions taken by the institution. This action has a typical duration of two years.

IV (interim Visit) – This action indicates that the program has one or more Weaknesses.

The Weaknesses are such that an on-site review will be required to evaluate the remedial actions taken by the institution. This action has typical duration of two years.

DRAFT

SCR (ShowCase Report) – This action indicates that a currently accredited program has one or more Deficiencies. The deficiencies are such that a progress report will be required to evaluate the remedial actions taken by the institution. This action has a typical duration of two years. This action cannot follow a previous SC action for the same Deficiency(s).

M.Eng.C. expects the institution to notify students and faculty that the program is required to make specific corrective actions to maintain accreditation.

SCV (ShowCase Visit) – This action indicates that a currently accredited program has one or more Deficiencies. The Deficiencies are such that an on-site review will be required to evaluate the remedial actions taken by the institution. This action has a typical duration of two years. This action cannot follow a previous SC action for the same Deficiency (ies).

M.Eng.C. expects the institution to notify students and faculty that the program is required to make specific corrective actions to maintain accreditation.

RE (Report Extended) - This action indicates that satisfactory remedial action has been taken by the institution with respect to Weaknesses identified in the prior IR action. This action is taken only after an IR review. This action extends accreditation to the next General Review and has a typical duration of either two or four years.

VE (Visit Extended) – This action indicates that satisfactory remedial action has been taken by the institution with respect to Weaknesses identified in the prior IV action. This action is taken only after an IV review. This action extends accreditation to the next General Review and has a typical duration of either two or four years.

SE (ShowCase Extended) - This action indicates that satisfactory remedial action has been taken by the institution with respect to all Deficiencies and Weaknesses identified in the prior SC action. This action is taken only after either a SCR or SCV review. This action typically extends accreditation to the next General Review and has typical duration of either two or four years.

NA (Not to Accredit) – This action indicates that the program has Deficiencies such that the program is not in compliance with the applicable criteria. This action is usually taken only after a SCR or SCV review, or the review of a new, unaccredited program. Accreditation is not extended as a result of this action. This action can be appealed as specified in the Appeals Section of this document.

(i)An Executive Summary of the findings leading to the not-to-accredit action will be provided to the institution along with the Final Statement.

(ii)A "Not to Accredit" action, as a result of a "Show Cause" focused review, is effective September 30 of the year of the "not to accredit" decision, pending final action on any request from the institution for immediate revisit, reconsideration, or appeal.

(iii)For accredited programs, M.Eng.C. will require the institution to formally nofity students and faculty affected by the revocation of the program's accredited status, not later than September 30 of the calendar year of the "not to accredit" action and to remove the accreditation designation from all program catalog copy, electronic and print.

(iv)T (Terminate) - This action is generally taken in response to a request by an institution that accreditation be extended for a program that is being phased out. The intent is to provide accreditation coverage for students remaining in the program.

DRAFT

(a)The duration of this action may be up to three years.

(b)This action may not follow either Show Cause action.

10 Acknowledgements

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(i) Federation of Engineering Institutions of Asia and the Pacific(FEIAP)
(ii) Chinese Institution of Engineers(CIE),Taiwan.
(iii) Institute of Engineer, Malaysia
(iv) Institute of Engineering Education, Taiwan(IEET)
(v) Board of Engineers, Malaysia.
(vi) Myanmar Engineering Council.(M.Eng.C.)
(vii) Myanmar Engineering Society.(MES)
(viii) Myanmar Maritime University.(MMU)

DRAFT

Annex

Glossary of Key Terms for Engineering Education Accreditation

Serial	Term	Definition
1.	Accreditation	A process of self-study by the program and external peer review by appropriately trained and independent teams from both academia and engineering practice for quality assurance, accountability, and quality improvement of an academic program designed to determine whether or not it has met or exceeded the published standards of the accreditor and is achieving its missions and objectives. Success results in an accredited program. Accreditation of an engineering educational program is the primary process used to ensure the suitability of graduates of that program meeting the entry level of the engineering profession.
2.	Accreditation Action	A judgment by an accrediting body regarding accreditation for institutions and/or programs. Includes, for example, accredited, denial of accreditation, probation, and warning. etc. *Also often called: decision; status.* *See also:*
3.	Accreditation Body	A body that develops accreditation standards and criteria and conducts peer review to assess whether or not those criteria are met. There are different types of accreditation bodies (e.g., agencies, councils, commissions, etc.), focused on general accreditation, specialized accreditation, professional accreditation, regional accreditation, national accreditation, distance education accreditation, etc. Generally, the accreditation body must make independent decisions without influence of education providers, government and other interest organizations.
4.	Accreditation Cycle	Accreditation decisions are time-limited, normally good for five or six years. The duration of validity of the accreditation license is established by the accrediting body, which generally holds the right to suspend and/or to renew the license, upon the satisfactory resolution of any identified issues. *Also often called: duration of accreditation.*
5.	Assessment	The process of the systematic gathering, quantifying, qualifying, and using information through a total range of written, oral and practical tests, as well as surveys, projects and portfolios, to judge the instructional effectiveness and the curricular adequacy in light of student learning outcomes. Assessment is necessary in order to validate a formal accreditation decision, but it does not necessarily lead to an accreditation outc
6.	Attributes	A list of characteristics, namely knowledge, skills, and attitudes, associated with an individual. *See also: outcomes.*
7.	Graduate Attributes	A list of characteristics, namely knowledge, skills, and attitudes, associated with an individual upon graduation from a degree-granting program.
8.	Benchmarks	Reference point or standard against which progress or outcomes may be measured and compared. Subject benchmark statements provide a means for the academic community to describe the nature and characteristics of programs in a specific term. They also represent general expectations about the standards for the award of qualifications at a given level and articulate the attributes and capabilities that those possessing such qualifications should be able to demonstrate.
9.	Best Practice	A superior method or an innovative process involving an actual accepted range of reasonable practices resulting in the improved performance of a higher education institution or program, usually recognized as “best” by other peer

DRAFT

		organizations. A best practice does not necessarily represent an absolute, ultimate example or pattern, the application of which assures the improved performance of a higher education institution or program; rather, it has to do with identifying the best approach to a specific situation, as institutions and programs vary greatly in constituencies and scope.
10.	Competence	A concept which embodies the ability of an individual to transfer skills and knowledge to specific situations.
11.	Continuous Professional Development	The planned acquisition of knowledge, experience and skills, and the development of personal qualities necessary for the execution of professional and technical duties throughout an engineer's professional life.
12.	Credit	The "currency" used to measure student workload in terms of the national learning time required to achieve specified learning outcomes. To each course unit a certain amount of credits are assigned. A credit system facilitates the measurement and comparison of learning outcomes achieved in the context of different qualifications, programs of study and learning environments.
13.	Criteria	Checkpoints/benchmarks by which the attainment of certain objectives and/or standards can be examined. These involve expectations about quality, effectiveness, financial viability, compliance with national rules and regulations, outcomes, and sustainability. Criteria describe in a certain degree of detail the characteristics of the requirements and conditions to be met [in order to meet a standard] and therefore provide the (quantitative and/or qualitative) basis on which an evaluative conclusion is drawn.
14.	Performance Criteria	Yardsticks/checkpoints/benchmarks that are used to judge the attainment of performance standards. As qualities, characteristics, or dimensions of a standard for student performance, they indicate how well students meet expectations of what they should know and be able to do, as expressed by varying gradients of success by (scoring) rubrics or by grades.
15.	Curriculum	Comprehensive description of a study program. It includes learning objectives or intended outcomes, contents, assessment procedures.
16.	Degree	Qualification awarded to an individual by a recognized higher education institution after successful completion of a prescribed study program. In a credit accumulation system the program is completed through the accumulation of a specified number of credits awarded for the achievement of a specific set of learning outcomes.
17.	Design	The process of devising a system, component, or process to meet desired needs. It is a decision-making process (often iterative), in which the basic science and mathematics and engineering sciences are applied to convert resources optimally to meet a stated objective. Among the fundamental elements of the design process are the establishment of objectives and criteria, synthesis, analysis, construction, testing and evaluation. The engineering design component of a curriculum must include most of the following features: development of student creativity, use of open-ended problems, development and use of modern design theory and methodology, formulation of design problem statements and specification, consideration of alternative solutions, feasibility considerations, production processes, concurrent engineering design, and detailed system description. Further it is essential to include a variety of realistic constraints, such as economic factors, safety, reliability, aesthetics, ethics and social impact.
18.	Effectiveness	An output of specific review/analyses that measure (the quality of) the achievement of a specific educational goal or the degree to which a higher education institution or a program can be expected to achieve specific requirements. It is different from efficiency, which is measured by the volume of

		output or input used. As a primary measure of success of a program or of a higher education institution, clear indicators, meaningful information, and evidence best reflecting institutional effectiveness with respect to student learning and academic achievement have to be gathered through various procedures (inspection, observation, site visits, etc.). Engaging in the measurement of educational effectiveness creates a value-added process through quality assurance and accreditation review and contributes to building, within the institution, a culture of evidence.
19.	Efficiency	An ability to perform well or to achieve a result without wasted resources, effort, time, or money (using the smallest quantity of resources possible). Educational efficiency can be measured in physical terms (technical efficiency) or in terms of cost (economic efficiency). Greater educational efficiency is achieved when the same amount and standard of educational services are produced at a lower cost, if a more useful educational activity is substituted for a less useful one at the same cost, or if unnecessary educational activities are eliminated. A program or a higher education institution may be efficiently managed, but not effective in achieving its mission, goals, or objectives.
20.	Engineer	The term "engineer" refers to a professional dedicated to engineering. "Engineering" is defined as a profession in which engineers make full use of their knowledge in mathematical science, natural science, and science of the artificial, to develop, research, manufacture, operate, and maintain hardware and software of artificial device and systems that contribute to the welfare and security of mankind, through economic exploitation of resources and natural forces, with good perspective of the future impact of such exploitation on society and the environment. A segment of the engineering profession that requires the individuals to complete an accredited program of study typified by four years or more of post-secondary study. The expected outcomes of the graduates are such as those accepted by the Washington Accord or its equivalent. *Also often called: Professional Engineer; Chartered Engineer.*
21.	Engineering Technician	A segment of the engineering profession that requires the individuals to complete an accredited program of study typified by two years or more of post-secondary study. The expected outcomes of the graduates are such as those accepted by the Dublin Accord or
#	**Term**	**Definition**
22.	Engineering Technologist	A segment of the engineering profession that requires the individuals to complete an accredited program of study typified by three years or more of post-secondary study. The expected outcomes of the graduates are such as those accepted by the Sydney Accord or its equivalent. *Also often called: Incorporated Engineer.*
23.	Ethics	Moral issues and decisions confronting the individuals involved in engineering practice.
24.	Indicators	Operational variables referring to specific empirically measurable characteristics of higher education institutions or programs on which evidence can be collected that allows for a determination of whether or not standards are being met. Indicators identify performance trends and signal areas in need for action and/or enable comparison of actual performance with established objectives. *See also: Criteria.*
25.	Performance Indicators	A range of statistical parameters representing a measure of the extent to which a higher education institution or a program is performing in a certain quality dimension. They are qualitative and quantitative measures of the output (short-term measures of results) or of the outcome (long-term measures of outcomes and impacts) of a system or of a program. They allow institutions to benchmark

DRAFT

		their own performances or allow comparison among higher education institutions. Performance indicators work efficiently only when they are used as part of a coherent set of input, process, and output indicators. As higher education institutions are engaged in a variety of activities and target a number of different objectives, it is essential to be able to identify and to implement a large range of performance indicators in order to cover the entire field of activity.
26.	Laboratory	Practical experimental class where the students are active and supervised by a staff member and/or assistants.
27.	Licensure	The process by which a governmental agency grants official permission to persons meeting predetermined qualifications to engage in a given occupation and/or use of a particular title. Licensure is usually obtained through examination or graduation from an accredited institution. In some countries, a period of practical experience may be required. *Also often called: licensing.*
#	**Term**	**Definition**
28.	Metrics	Specific statements identifying the performance required to meet specific standards, the performance is measurable, the performance is documentable.
29.	Objectives	Short statements that describe the specific knowledge, skills, abilities and/or attitudes expected of graduates three to five years after graduation.
30.	Outcomes	Specific knowledge, skills, abilities, and attitudes that students possess at graduation that lead to achievement of the program's objectives. An outcome must be distinguished from an objective. *Also often called: learning outcomes; student outcomes; attributes.*
31.	Outcomes Assessment	The process of evaluation and improvement of specific results of a higher education program in order to demonstrate its effectiveness. Assessment may concern the performance of teaching staff, the effectiveness of institutional practices, and/or the functioning of departments or programs (e.g., program reviews, budget reviews, etc.). It is a formative procedure used for self-study, financial retrenchment, program evaluation, and better understanding of the current needs of students.
32.	Peer	Increasingly used for "evaluator" or "panel member" in a quality assurance and/or accreditation process, to underline that it is a "peer process."
33.	Profile	List of attributes for specific competencies.
34.	Program	It is a generic term to represent departments and courses concerned. Programs here are not confined to those provided solely by a department within a faculty as is typically the case with the majority of the universities. A program can consist of multiple departments, while a department can provide multiple programs. It is desirable that the name of a newly established program appropriately represents the program's specialized field of study, clearly indicating its learning or educational objectives, so that it can be precisely recognized by the public.
35.	Qualification	A generic term that usually refers an award granted for the successful completion of a study program, in accord to the standard set by an institution of education in a particular filed of study. A qualification is important in terms of what it signifies: competencies and range of knowledge and skills. Sometimes it is equivalent to a license to practice.
#	**Term**	**Definition**
36.	Professional Qualification	The set of requirements necessary for access to a profession, in particular a regulated profession.
37.	Quality	The extent to which a course, the teaching activities and the provider's facilities help students achieve worthwhile learning goals. Quality in higher education is a multi-dimensional, multi-level, and dynamic concept that relates to the

DRAFT

		contextual settings of an educational model, to the institutional mission and objectives, as well as to specific standards within a given system, institution, program, or discipline.
38.	Quality Assurance	An all-embracing term referring to an ongoing, continuous process of evaluating (assessing, monitoring, guaranteeing, maintaining, and improving) the quality of a higher education system, institutions, or programs. As a regulatory mechanism, quality assurance focuses on both accountability and improvement, providing information and judgments (not ranking) through an agreed upon and consistent process and well-established criteria. The scope of quality assurance is determined by the shape and size of the higher education system. *Also often called: quality control; quality management.*
39.	Recognition	The provision by which a body or institution (recognizer) considers another body or institution (recognized) appropriate or competent for a certain purpose.
40.	Academic Recognition	Approval of courses, qualifications, or diplomas from one (domestic or foreign) higher education institution by another for the purpose of student admission to further studies. Academic recognition can also be sought for an academic career at a second institution and in some cases for access to other employment activities on the labor market (academic recognition for professional purposes).
41.	Mutual Recognition	Agreement by two or more institutional bodies to validate each other's degrees, programs, or institutions and/or affirmation by two or more quality assurance or accrediting agencies that the methodology of the agencies are sound and that the procedures are functioning accordingly.
42.	Review	The general process of a systematic and critical analysis leading of assessment data to judgments and/or recommendations regarding the quality of a higher education institution or a program. Evaluation is carried out through internal or external procedures. *See also: Accreditation.*
43.	Interim Review	A checkpoint during the accreditation cycle to monitor the continuous improvement of the program.
44.	Monitoring Review	A periodic evaluation of the accreditation body by its peers on its effectiveness of reviewing the programs and on its fulfillment to meet the requirements of the collective peers.
45.	Self-study	The review and evaluation of the quality and effectiveness of an institution's own academic programs, staffing, and structure, based on standards set by an outside quality assurance body, carried out by the institution itself. Self-studies usually are undertaken in preparation for a quality assurance site visit by an outside team of specialists. Results in a self-study report.
46.	Site Visit	Site visit is normally part of the accreditation process, which is conducted by a team of peer reviewers who, after examining the institution's or the program's self-study, interview faculty, students, and staff; and examine the structure and effectiveness of the institution and its academic programs.
47.	Standards	The level of requirements and conditions that must be met by institutions or programs to be accredited or certified by a quality assurance or accrediting agency. These conditions involve expectations about quality, attainment, effectiveness, financial viability, outcomes, and sustainability.
48.	Substantial Equivalent	The recognition by an organization/competent authority that a course unit, a study program or degrees awarded by different institutions of higher education are equivalent. When not considered complete, equivalence is often qualified as substantial