Federation of Engineering Institutions
of Asia and the Pacific (FEIAP)

FEIAP
ENGINEERING EDUCATION AND ACCREDITATION GUIDELINES FOR ENGINEERING TECHNOLOGIST

12 July 2018

FEIAP Standing Committee on Engineering Education

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of Asia and the Pacific (FEIAP)

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FEIAP Engineering Education Working Group

FEIAP ENGINEERING EDUCATION GUIDELINES FOR ENGINEERING TECHNOLOGISTS

1.0 ACCREDITATION CRITERIA TEMPLATE FOR ACCREDITATION AGENCIES

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 engineering technologist. The second stage of formative development occurs as the new 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 engineering technologist.

The prime objective of an accreditation system is to evaluate the educational experiences and assessment processes being provided in the foundation education program, and to pass judgment on the appropriateness and quality of the graduate outcomes that are projected as a consequence of the educational experiences. Outcomes-based accreditation criteria will address wide ranging factors that influence the standard of 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 accreditation body is able to provide a benchmark statement of expected graduate outcomes in the particular career category. Such a statement will provide a key reference for both education developers as well as those involved in developing and implementing the accreditation criteria and processes. The benchmark statement of expected 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 educational provider in consultation with stakeholders, as the educational design process unfolds for a particular program within a nominated discipline.

Any foundation education program must be based on a defined graduate outcomes specification that sets out the capability targets for 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 graduate outcomes set out by the accreditation body if

the program is to be considered for accreditation within the economy of the accreditation body. The benchmark statement of graduate outcomes set by the accreditation body thus drives the processes of educational design and program accreditation.

In order to ensure the substantial equivalence of graduates from programs which arise across the boundaries of accreditation economies, it is essential that the benchmark statements of graduate outcome expectations set up by various accreditation bodies satisfy a common point of reference or standard. To help facilitate this, the Educational Accords under the International Engineering Alliance (IEA) have published a Graduate Attributes Exemplar Statement for Engineering Technologist (Appendix 1). These Statements set out a generic knowledge profile as well as generic attributes which are expected to characterise graduates within a particular career category. The Exemplar Statements provide a template or Framework for Education Accord signatories as they in turn establish localised benchmark statements of graduate outcome expectations. The Exemplar Statements thus assist in achieving substantial equivalence of 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 education providers as they devise the detailed specification of graduate outcomes for an engineering education program in any particular discipline.

The Graduate Attributes Exemplar Statements for Engineering Technologist published under the IEA are commended as a useful guideline reference for established and emerging accreditation bodies within FEIAP. These Statements provide a generic standard for the knowledge profile and the attributes against which 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 engineering technologist. The range qualifiers differentiate the nature of problem solving and engineering activities in each of these career categories. The International Engineering Alliance has published a companion Exemplar Statement for the mature practitioner in each career category, to assist with the achievement of substantial equivalence within the registration/licensing process. These Statements are each titled – 'Professional Competency Profile' and each mirrors the corresponding 'Graduate Attributes Exemplar' in the particular career category.

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

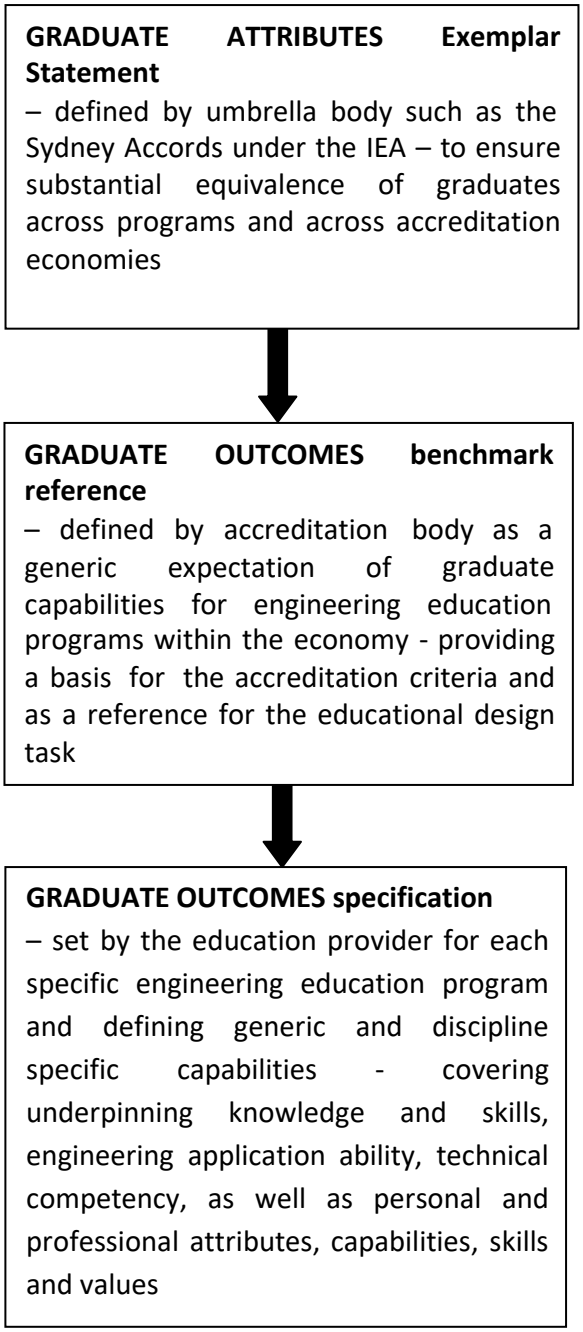

Figure 1.1 Hierarchy of references for ensuring substantial equivalence of graduate outcomes between engineering education programs, within and across accreditation economies.

1.2 Accreditation Criteria

An outcomes-based accreditation system must evaluate the educational experiences and assessment processes set out in the foundation education program, and pass judgment on the appropriateness and quality of the 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 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 education provider, to establish the 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 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 graduate outcomes specification. This then provides a fundamental reference for systematically tracking attainment of outcomes in each individual 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.

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 graduate outcomes. A graduate outcomes benchmark reference is the key basis for the criteria and provides a generic template for educational providers to establish the detailed, customised specification of 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 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 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.

FEIAP ENGINEERING EDUCATION GUIDELINES FOR ENGINEERING TECHNOLOGISTS

2.0 THE ACCREDITATION SYSTEM MODEL FRAMEWORK

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

- Graduate capabilities appropriate to a period of 'nation building';
- Graduate capabilities benchmarked against best international practices and standards such as those set out by the IEA Educational Accords or other equivalent systems.

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

2.1 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.

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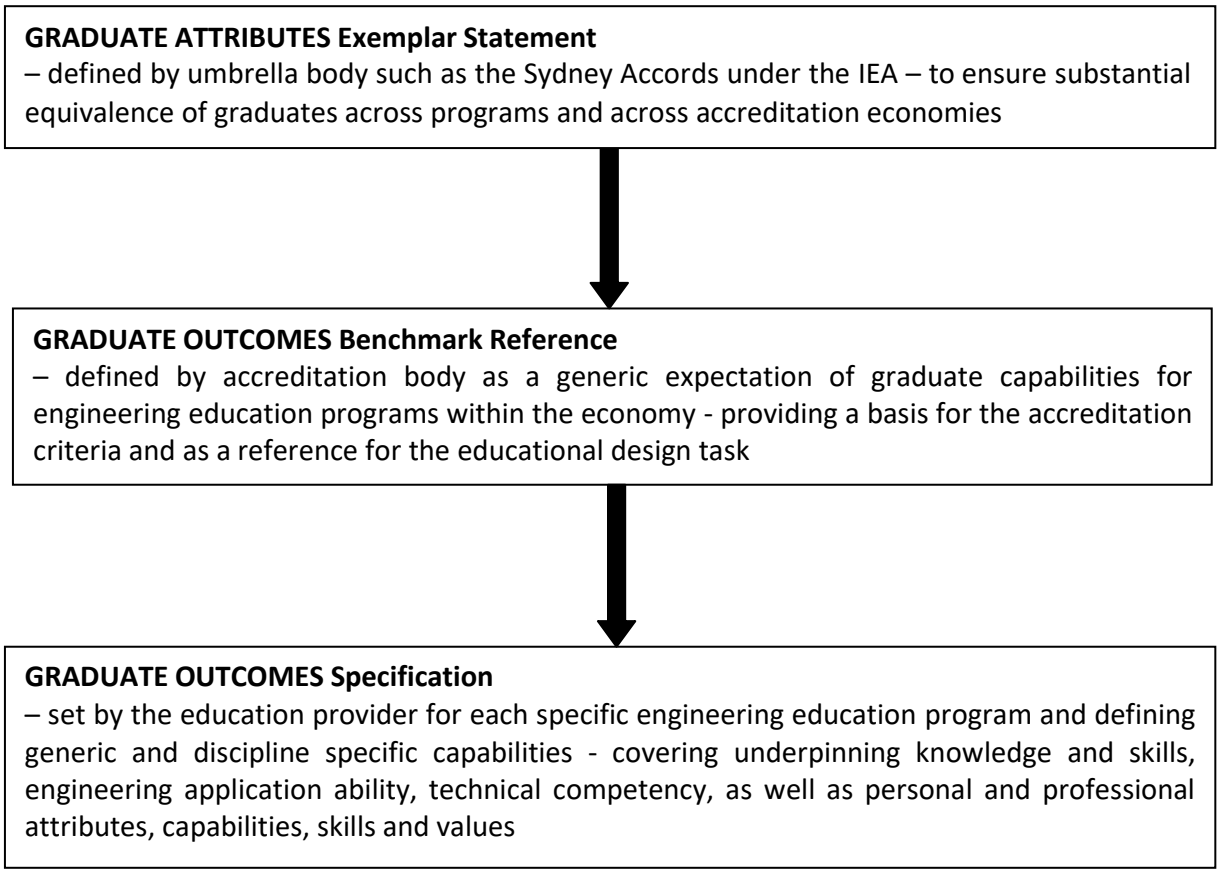

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- Approach to assessment and performance evaluation;
- Benchmarking practices;
- Governance processes and structure;
- Student administration systems.

2.3 Accreditation Process

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

(1) Documents to be provided by programs

The accreditation body must require 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 program fulfils requirements set out by the accreditation body. Specifically, the program must provide sufficient evidence, through appropriate and diverse assessment means, to demonstrate that it fulfils the accreditation body's requirement on graduate outcomes. The accreditation team will deliver preliminary findings from reviewing the report and verify their findings through the accreditation visit. The self-review submission must include the following:

(2) Composition of accreditation team

The 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 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 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 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 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 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 accreditation body must provide a written report to the 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 program. This information will not only support the delivery of accreditation decision but also directions for continuous improvement of the program.

(6) Decision on accreditation

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

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

2.4 Governance of the Accreditation Body

(1) Official Status
The 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 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 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 accreditation body and that there exists a systematic approach to achieving its goals and objectives.

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

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

(5) Leadership and Management
The 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 accreditation body should exercise in accordance with appropriate governance policies during leadership and management changes to enable stability at all times.

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

1. The 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 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.

FEIAP ENGINEERING EDUCATION GUIDELINES FOR ENGINEERING TECHNOLOGISTS

3.0 MENTORING SYSTEM

The FEAIP Engineering Education Guidelines for Engineering Technologist provide a structural framework for mentoring services provided under the FEAIP umbrella which will be made available to member economies. Mentoring will follow the FEIAP Engineering Education model framework for Engineering Technologist and lead to the phased development of accreditation systems and graduate outcomes that satisfy FEIAP Engineering Education requirements for Engineering Technologist and progress, leading to standards of equivalence with IEA Education Accords for Engineering Technologist or other equivalent systems. The mentoring framework for Engineering Technologist will detail mentoring principles, processes for appointment of mentoring teams, reporting mechanisms, expenses, continuation and termination of the mentoring services, and guidelines for mentors.

3.1 Participation

Organisations wishing to participate either as mentees or mentors must be FEIAP members. It will be the decision of the individual organisation as to whether it seeks mentoring support.

Mentoring under the FEIAP umbrella is quite separate to the mentoring services or the processes for seeking membership of other engineering education organisations such as the IEA Educational Accords. Having participated in a FEIAP mentoring relationship will not guarantee successful admission to any other international organisation.

3.2 Appointment and Qualification of Mentor

1. Mentoring is provided by individuals representing the mentor organisations, whereas the mentee is the organisation that receives the mentoring services.
2. Organisations may formally request mentors by lodging a request with the Accreditation Steering Committee.
3. When allocating mentoring organisations the FEIAP Accreditation Committee must be cognizant of the size of the proposed mentee organisation. Cognizance should also be taken of the geographical closeness of the mentors and mentee.
4. On receipt of a formal request from an organisation for mentoring, the Accreditation Steering Committee will assign at least two member organisations recognized by FEIAP or are signatories to the appropriate educational Accord within the International Engineering Alliance or other equivalent systems. Each of these mentoring organisations will in turn nominate an appropriate representative person to serve on the mentoring team.
5. Those persons appointed to fulfil the mentoring process must be knowledgeable, with practical experience in the application of accreditation systems and the engineering education standards in place within their own economy.
6. Mentors act on behalf of the Accreditation Steering Committee, which must be informed of the agreed terms of reference of the mentoring relationship as well as when and what mentoring activities have been undertaken.

7. Mentoring relationships are arranged for a set purpose and for a set period of time. The purpose and time period should be negotiated between the mentee and the mentors and approved by the Accreditation Steering Committee.

3.3 Reporting

1. Mentor to Mentee
   Mentors may advise the mentee verbally and in writing. The advice is confidential to the mentors, their representing organisations and the mentee. Any release of the mentoring advice by mentors to third parties, including the Accreditation Steering Committee, must have consent of the mentee.

2. Mentor Report to the Accreditation Steering Committee
   Mentors or their representing organisations must report to the Accreditation Steering Committee after the mentoring relationship becomes effective and a mentoring visit took place. Schedules of the subsequent reports are at the mentors' judgment when significant progress or development occurs. Mentor reports shall include the following information:
   - the agreed terms or reference of the mentoring relationship;
   - the facts of mentor visits to the organisation of the mentee e.g. dates of visits, activities undertaken during the visit;
   - a general statement as to the mentee's progress.

   The mentee is encouraged to provide feedback on the mentoring experiences. If the mentee wishes, the mentor's report could be submitted to the Accreditation Steering Committee with the mentors' reference.

3. Accreditation Steering Committee reporting to the FEIAP Executive Committee
   The Accreditation Steering Committee will provide a status report to the FEIAP Executive Committee at the Executive Committee meetings about the development and progress of the mentoring services.

3.4 Expenses

Mentors are acting on behalf of the Accreditation Steering Committee, and the mentoring services are not consulting services. Therefore, mentors are strictly refrained from charging the mentee any fee for their services. However, expenses incurred as a result of the mentoring visits, such as airfare (less than five hours economy class, more than five, business class), visa application, accommodation, etc., shall be borne by the mentee.

3.5 Continuation and Termination of the Mentoring Services

Mentors are assigned by the Accreditation Steering Committee for a set period of time. However, if the mentee wishes to continue the services with the same mentors, the services can be continued by the mentors' consent and by informing the Accreditation Steering Committee.

Should a mentee or a mentor like to terminate the mentoring services either by the set time period or earlier, the Accreditation Steering Committee must be informed.
Written statements would be required either to continue or to terminate the mentoring services.

3.6 Guidelines for Mentors

1. Mentors must advise the mentees in accordance with the FEIAP Engineering Education model Framework for Engineering Technologist.
2. Mentors must be familiar with and sensitive to the educational system, the culture and environment of higher education, the development of engineering programs and the engineer registration system within the mentee economy. Subsequently, mentors must be sensitive, to the mentee's specific needs, progress plan and decision making regime.
3. Mentors must refrain from being judgmental in providing advice and must act in a professional and objective manner. In providing advice, mentors must observe the sovereignty and statutory requirements of the mentee economy.
4. The contents of mentoring reports must be objective and should provide observations and findings that clearly indicate the mentee's progress towards the phased development of accreditation systems and graduate outcomes that will satisfy APEC base education requirements. In addition, the reports could also provide information about the mentee's progress towards satisfying the standards equivalent to the educational accords of the International Engineering Alliance and/or other equivalent systems..
5. Mentors must be clear with their advice either in verbal or written format.
6. Mentors should encourage the mentee to become part of the community by attending engineering accreditation related meetings.
7. Members of the mentoring team are advised to work closely together with clear communication in order to maintain consistency with comment and advice.

3.7 Mentoring Provided by Individual Signatories

Organisations may approach individual economies directly to request support through a private mentoring arrangement. If a member accepts this request then they must inform the Accreditation Steering Committee so that other members are made aware of the private mentoring arrangement. The Accreditation Steering Committee cannot be responsible for the quality of advice and support provided through this private mentoring arrangement.

FEIAP ENGINEERING EDUCATION GUIDELINES FOR ENGINEERING TECHNOLOGISTS

4.0 EVALUATION OF ACCREDITATION AGENCY

Member economies having developed accreditation systems under the FEIAP Engineering Education Guidelines may apply for assessment and subsequent recognition under the FEIAP framework. Assessment of accreditation criteria, practices and processes will be undertaken by a commissioned team of appropriate member representatives in order to evaluate the integrity and robustness of accreditation processes for assuring graduate outcome standards that meet FEIAP Engineering Educational requirements and are appropriately referenced against the exemplar standards set by the Sydney Accord and/ or other equivalent systems.. A judgment on a particular accreditation agency may lead to a classified recognition of an engineering education program. Two levels of recognition are available and are based on the level of maturity of the applicant agency's accreditation system and processes, as well as the qualifications (degree, advanced diploma, diploma or certificate) of compliance with the criteria that is set out under the FEIAP Engineering Education framework for Engineering Technologist. The first level of compliance is appropriate to the 'nation-building' phase of the economy. The second level of recognition is an acknowledgement of the standard of accredited programs within the applicant agency's economy as meeting the base level education requirements that might be expected under appropriate educational Accord within the International Engineering Alliance or other equivalent systems.. This second level of recognition may be accorded as an outcome of a first time evaluation of the applicant agency, or may be an outcome of a second judgment taken after a period of formation, and subsequent to an earlier recognition outcome at the 'nation building' level.

Ultimately such judgment must of course also reveal appropriateness of an accreditation agency to seek recognition under the Sydney Accord or equivalent systems. FEIAP Engineering Education Guidelines will provide a structured evaluation framework and will detail submission requirements, processes for appointing evaluation teams, evaluation processes, and decision making. Economies with accreditation systems already recognized under the Sydney Accord or other equivalent systems would not need to submit for such evaluation when seeking FEIAP membership.

4.1 Application

1. An accreditation agency (subsequently referred to as the Applicant) seeking FEIAP recognition should apply to the Accreditation Steering Committee by submitting a completed Application Form and supporting documentation.
2. The application must be in English.
3. The entire application package (four paper copies and one electronic copy) must be received by the Accreditation Steering Committee no later than 120 days before the commencement of the FEIAP General Assembly at which the application is to be considered.
4. The application must be accompanied by written statements of nomination from two member economies, each nomination containing a declaration that the nominating economy considers that the Applicant's accreditation system meets the FEIAP requirements at one of the two levels of recognition outlined above.
5. A representative of the Applicant must appear in person at the FEIAP General Assembly to formally present the application and answer questions.

4.2 Documentation in Support of Applications

The documentation provided on the accreditation system should include the following sections:

1. Accreditation Organisation
    - Provide the name of the Applicant organisation.
    - List the names of the officers of the organisation with brief CVs.
    - Describe the affiliation of the organisation with other engineering bodies, government and industry within the economy.

2. Introduction
    - Provide general information about the economy and the context of engineering.

3. Education
    - Provide a description of primary, secondary, and tertiary education.
    - Describe the nature of programs, including admission standards.
    - Provide the number and type of engineering institutions and programs, indicating whether the institutions are public or private.

4. Structure of the Engineering Community
    - Describe the context of engineering practice and the degree of regulation (i.e. registration vs licensing).
    - Describe if there is a protected title and scope of practice.
    - Describe any differing categories of engineering practitioners and their academic requirements.
    - Describe the relationship of the organisation to licensing, registration or certifying agencies, and the extent to which the organisation can influence the acceptance of accreditation by those agencies.

5. Role of Accreditation
    - Describe the role of accreditation in registration.
    - Given that accreditation is normally voluntary, describe the degree of participation.

6. Accreditation System
    - Describe the development of the accreditation system and its maturity.
    - Provide a description of the Accreditation Board including its composition and authority.
    - List the objectives of accreditation.
    - Provide the criteria for accreditation (general, program specific; curriculum content-technical and non-technical; incorporation of practical experience; length of the program; naming of the program; faculty requirement, etc.)
    - Provide detailed policies and procedures for conducting the accreditation evaluation and making the accreditation decision, include relevant documentation (initiation of visit; self-evaluation questionnaire; selection of evaluation; organisation of the visit; due process).
    - Provide a list of currently accredited programs and a schedule of upcoming evaluations.
    - Describe relationships with external engineering organisations, including any agreements.

4.3 Appointment of Review Team

The FEIAP Accreditation Steering Committee will appoint a three-person Review Team to assess the application. Each of the reviewers will represent a different member economy. Members of the Review Team should be completely independent of the Applicant and have the necessary knowledge, experience and expertise to conduct the review. The Applicant may request that reviewers be replaced, if there is a possible conflict of interest.

4.4 Evaluation Process

The evaluation process involves the following:

1. Evaluation of the submitted application and supporting documentation;
2. Observation and evaluation of at least two accreditation visits at cross-sectional institutions of the Applicant;
3. Observation and evaluation of the decision making process of the Applicant, in which the decisions on the observed accreditation visits are to be reached;
4. Submission of an evaluation report to the Accreditation Steering Committee recommending to the member economies whether the Applicant satisfies the FEIAP requirements for recognition at one of the following levels:
   - 'nation building';
   - educational requirements base level education requirements that might be expected under appropriate educational Accord within the International Engineering Alliance or other equivalent systems.

4.5 Evaluation Standards

1. Accreditation Standards

The Applicant must demonstrate an appropriate standard of compliance with the requirements stipulated in the following sections of the *FEIAP Engineering Education Accreditation Criteria Template for Engineering Technologists*.

i. Graduate Outcomes Specification
ii. Education Environment
iii. Program Design, Structure, Content and Assessment Processes
iv. Quality Systems

2. Accreditation Procedures

The Applicant must demonstrate an appropriate standard of compliance with the requirements stipulated in Section III of the *FEIAP Engineering Education Accreditation System Model Framework for Engineering Technologist*.

i. Documents to be Provided by Programs,
ii. Composition of Accreditation Team,
iii. Duration of Accreditation Visit,
iv. Structure of the Accreditation Visit,
v. Verification and Validation of the Report by the Accreditation Agency,
vi. Decision on Accreditation,
vii. Publication of Accreditation Decisions,
viii. Procedures of Appeals.

3. Governance of the Accreditation Body

The Applicant must demonstrate an appropriate standard of compliance with the requirements stipulated in Section IV of the *FEIAP Engineering Education Accreditation System Model Framework for Engineering Technologist*.

i. Official Status
ii. Mission Statement
iii. Activities
iv. Resources
v. Leadership and Management
vi. Independence
vii. Accountability and Integrity
viii. Decision Making

The Accreditation Steering Committee will evaluate the report of the Review Team, and decide whether or not the Applicant should be recognized at either the 'nation building' or appropriate educational Accord within the International Engineering Alliance or other equivalent education levels. The Applicant will be informed of the decision, and receive a final version of the report. The Applicant may ask, in writing, for further information about the decision.

If the decision is not to recognize the Applicant, the Applicant may appeal to the FEIAP Executive Council.

The maximum period of recognition is six years. Before the expiration of this period, a recognized accreditation agency should apply for re-evaluation to demonstrate ongoing compliance with requirements.

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5.0 PERIODIC MONITORING OF ACCREDITATION AGENCY

(Draft amended by Alan Bradley June 2015)

Once a member economy has attained recognition under the FEIAP system, a periodic peer monitoring process will apply. FEIAP guidelines will provide an evaluation framework for assessing the on-going compliance of the accreditation system and the continuing standard of graduate outcomes. FEIAP Engineering Education Guidelines will provide the monitoring framework and will detail submission requirements, processes for appointing monitoring review teams, monitoring processes, and decision making. Member economies with accreditation systems already recognized under the Sydney Accord or other equivalent systems will be exempted from such periodic monitoring.

5.1 Submission of Documents

If the member economy under review is a non English speaking economy, English translations must be provided for the review team conducting the monitoring process. The documentation should be submitted no less than 60 days prior to the review team's visit and should include the following sections in English:

1. Accreditation Organisation
   - List the names of the officers of the organisation with brief CVs.
   - Describe the affiliation of the organisation with other engineering bodies, government and industry within the economy.

2. Role of Accreditation
   - Describe the role of accreditation in registration.
   - Given that accreditation is normally voluntary, describe the degree of participation.

3. Accreditation System
   - Provide a description of the Accreditation Board including its composition and authority.
   - Provide the criteria for accreditation (general, program specific; curriculum content-technical and non-technical; incorporation of practical experience; length of the program; naming of the program; faculty requirement, etc.)
   - Provide detailed policies and procedures for conducting the accreditation evaluation and making the accreditation decision, include relevant documentation (initiation of visit; self-evaluation questionnaire; selection of accreditation evaluation team; organisation of the visit; due process).
   - Provide a list of currently accredited programs.

4. Changes Made
   - Provide information on changes made since last review.
   - Provide information to demonstrate evidence of continuous improvement.

5.2 Appointment of Review Team

The Accreditation Steering Committee will appoint a three-person review team to conduct the monitoring process. Each of the reviewers represents a different member economy. Members of the review team should be completely independent of the member economy under review and have the necessary knowledge, experience and expertise to conduct the review. The member economy under review may request that reviewers be replaced, if there is a possible conflict of interest.

5.3 Evaluation Process

The review process involves the following:

1. Evaluation of the submitted documents;

2. Monitoring visit should include the following meetings:
   - visit to the accreditation office of the member economy under review;
   - observation and evaluation of at least two accreditation visits at cross-sectional institutions;
   - post-visit team meeting to structure the monitoring report;
   - observation and evaluation of the decision making process of the member economy under review, in which the decisions on the observed accreditation visits are to be reached.

3. Submission of an monitoring report to the Accreditation Steering Committee no less than 60 days prior to the next meeting of the FEIAP General Assembly recommending to the member economies whether the member economy under review continue to meet the FEIAP requirements for substantial equivalency. The report shall include:
   - an executive summary outlining major system characteristics and citing recommended action with the appropriate action statement;
   - an overall introduction to the accreditation system under review and its standards;
   - information on accreditation policies, procedures and criteria for the system under review, including a comprehensive analysis of how the accreditation recognition process address marginal, difficult conditional actions;
   - A brief description of the educational provider and a listing of the programs observed and accredited results in order set the context for the review;
   - indications of any stated or observed substantial deviations to the accreditation criteria, policies or procedures of the system under review and the rationale for the change;
   - a statement as to whether the standard of the graduates of accredited programs are substantially equivalent to graduates of other members of the FEIAP;
   - any statement of weakness or deficiency; and
   - recommended action.

5.4 Evaluation Standards

1. Accreditation Standards

The member economy under review must continue to be compliant with the requirements stipulated in the following sections of the *FEIAP Engineering Education Accreditation Criteria Template for Engineering Technologists*:

- Graduate Outcomes Specification;
- Education Environment;
- Program Design, Structure, Content and Assessment Processes;
- Quality Systems.

2. Accreditation Procedures

The member economy under review must continue to be compliant with the requirements stipulated in Section III of the *FEIAP Engineering Education Accreditation System Model Framework for Engineering Technologist*:

- Documents to be Provided by Programs;
- Composition of Accreditation Team;
- Duration of Accreditation Visit;
- Structure of the Accreditation Visit;
- Verification and Validation of the Report by the Accreditation Agency;
- Decision on Accreditation;
- Publication of Accreditation Decisions;
- Procedures of Appeals.

3. Governance of the Accreditation Board

The member economy under review must continue to be compliant with the requirements stipulated in Section IV of the *FEIAP Engineering Education Accreditation System Model Framework for Engineering Technologist*:

- Official Status;
- Mission Statement;
- Activities;
- Resources;
- Leadership and Management;
- Independence;
- Accountability and Integrity.

4. Continuous Improvement

The member economy under review must demonstrate that it continues to take measures to improve its accreditation system, not only for the purpose of fulfilling requirements of the *FEIAP Engineering Education Accreditation Criteria Template for Engineering Technologists* and the *FEIAP Engineering Education System Model Framework for Engineering Technologist,* but also for elevating its contribution to the development of engineering education within the economy as well as the FEIAP community.

5.5 Decision Making

The Accreditation Steering Committee will evaluate the monitoring report prepared by the review team, and confirm whether the member economy continues to meet the FEIAP requirements for substantial equivalency. The categories of recommendations are:

1. The member economy under review be accepted by FEIAP for a period of six years, based on a determination that its accreditation processes lead to outcomes substantially equivalent to the systems known to the monitoring review team;

2. The member economy under review be accepted by FEIAP for a period of no more than two years subject to the submission of a report which satisfies that adequate steps are being taken to address the specific issues identified by the monitoring review team;

3. Due to serious deficiencies, the member economy is reclassified immediately to conditional status and that urgent and specific assistance be offered by FEIAP.

5.6 Expenses

Expenses incurred as a result of the periodic monitoring review, such as airfare (less than five hours, economy class; more than five, business class), visa application, accommodation, etc., must be borne by the member economy under review.

APPENDIX 1
Graduate Attribute Profiles for Engineering Technologist (International Engineering Alliance)

References to the Knowledge Profile are shown: SK1-SK8 (Refer to Appendix 2)

Differentiating Characteristic	Graduate Attribute
Engineering Knowledge:	**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.
Problem Analysis Complexity of analysis	**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)
Design/ development of solutions: Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified	**SA3:** Design solutions for *broadly- defined* engineering technology problems and *contribute to* the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (SK5)
Investigation: Breadth and depth of investigation and experimentation	**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.
Modern Tool Usage: Level of understanding of the appropriateness of the tool	**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)
The Engineer and Society: Level of knowledge and responsibility	**SA6:** Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly defined engineering problems. (SK7)
Environment and Sustainability: Type of solutions.	**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)
Ethics: Understanding and level of practice	**SA8:** Understand and commit to professional ethics and responsibilities and norms of engineering technology practice. (SK7)
Individual and Team work: Role in and diversity of team	**SA9:** Function effectively as an individual, and as a member or leader in diverse teams.

Differentiating Characteristic	Graduate Attribute
Communication: Level of communication according to type of activities performed	**SA10:** Communicate effectively on *broadly-defined* engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
Project Management and Finance: Level of management required for differing types of activity	**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
Lifelong learning: Preparation for and depth of continuing learning.	**SA12:** Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

APPENDIX 2
Knowledge Profiles for Engineering Technologist (International Engineering Alliance)

A Sydney Accord programme provides:
SK1: A systematic, theory-based understanding of the **natural sciences** applicable to the sub-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
SK3: A systematic , theory-based formulation of **engineering fundamentals** required in an accepted sub-discipline
SK4: Engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for an accepted sub-discipline
SK5: Knowledge that supports **engineering design** using the technologies of a practice area
SK6: Knowledge of **engineering technologies** applicable in the sub-discipline
SK7: Comprehension of the role of technology in society and identified issues in applying engineering technology: ethics and impacts: economic, social, environmental and sustainability
SK8: Engagement with the **technological literature** of the discipline

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ENGINEERING EDUCATION GUIDELINES
(Engineering Technologist)

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