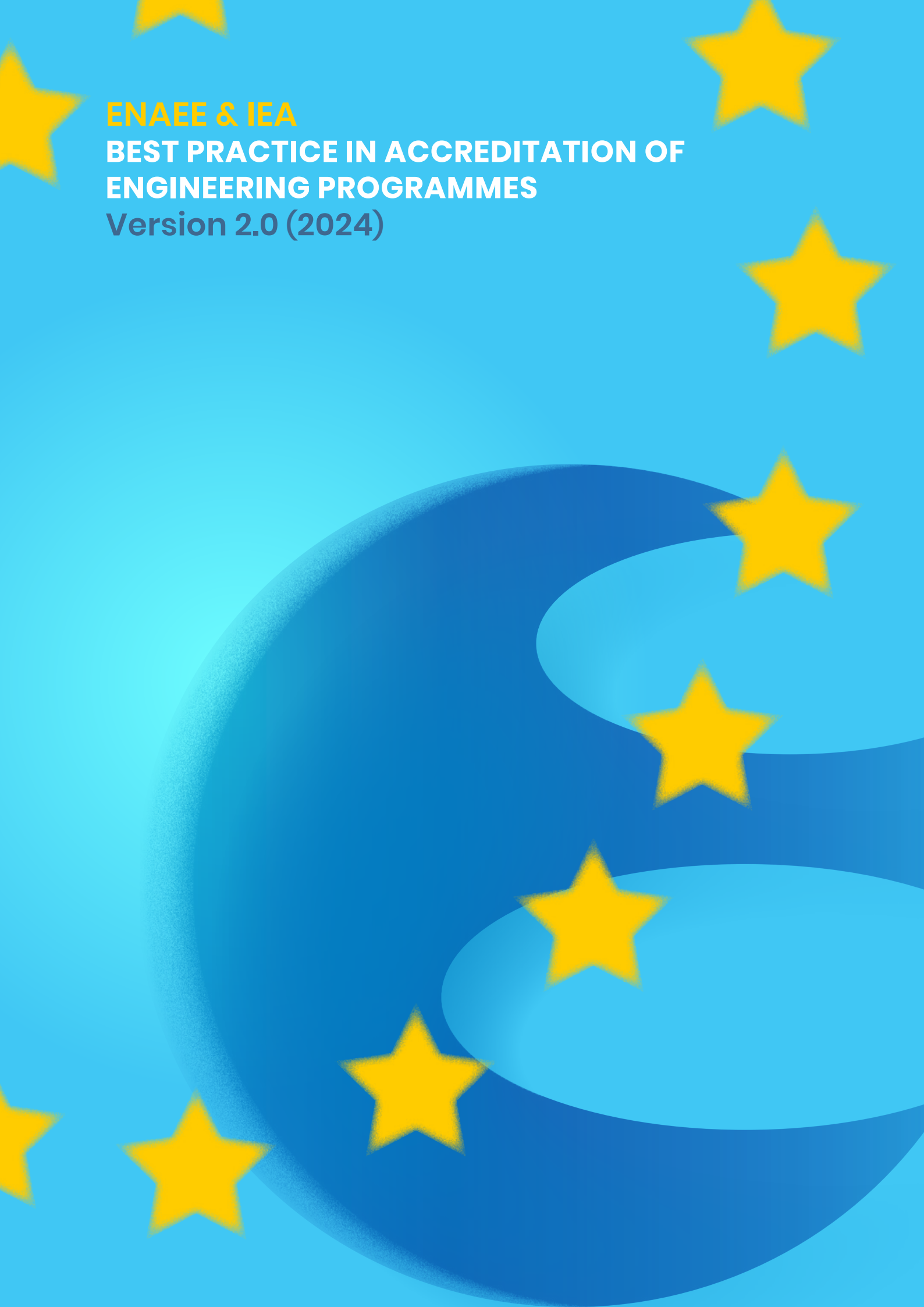
ENAEE & IEA
BEST PRACTICE IN ACCREDITATION OF ENGINEERING PROGRAMMES
Version 2.0 (2024)



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European Network for Accreditation of Engineering Education

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1 BACKGROUND

This exemplar of best practice in accreditation of engineering programmes has been developed jointly by the European Network for Accreditation of Engineering Education (ENAEE) and the International Engineering Alliance (IEA).

IEA and ENAEE are committed to best practice in the accreditation of programmes and have given effect to this commitment by the joint development of this exemplar that details a common understanding of best practice in engineering accreditation. It serves both ENAEE and IEA in their ongoing activities. It may also be of interest to bodies forming new agencies or developing accreditation systems to the level required by either IEA Accords or EUR-ACE®.

ENAEE members are committed to building confidence in systems of accreditation of engineering degree programmes within Europe and to promoting the implementation of good accreditation practice for engineering education globally. ENAEE operates the EUR-ACE® framework and accreditation system that provides a set of standards that identifies high quality engineering educational programmes.

ENAEE authorises accreditation agencies to award the EUR-ACE® label to accredited engineering degree programmes, which are listed in the single EUR-ACE database. EUR-ACE® labels are awarded at the Bachelor Degree and Master Degree level, as defined in the Qualifications Framework of the Bologna Process[1] and follow the criteria set out in the EUR-ACE® Framework Standards and Guidelines (EASFG). The accreditation agencies authorized by ENAEE to award EUR-ACE® labels have signed the EUR-ACE® Accord, a mutual recognition agreement that commits the agencies to promoting the agreement in order to facilitate licencing for professional practice, academic mobility, and transfer of students across jurisdictions.

IEA Washington, Sydney, and Dublin Accords signatories are committed to advancing engineering educational quality and enhancing the global mobility of professional engineers, engineering technologists, and engineering technicians respectively. Quality assurance of signatories' accreditation systems assure they are comparable. Through the multi-lateral nature of the Accord agreements, this provides mutual recognition of the qualifications of signatories' graduates for entry to practice across all relevant Accord signatories.

IEA Accords use two reference points. First, the educational standard applied by a signatory to accreditation must demonstrate it is substantially equivalent to the relevant Accord exemplar detailed in the IEA ***Graduate Attributes and Professional Competencies benchmark standards*** (Sept 2021). Second, the signatory must demonstrate it operates an accreditation process characterized by quality indicators specified in the Accord Rules and Procedures[2] (IEA 2019), applicable under all Accords. Each signatory is expected to make every reasonable effort to ensure bodies responsible for registering or licensing engineers to practice in its country or territory accept the substantial equivalence of engineering academic programmes accredited by the signatories to the relevant Accord.

This exemplar of best practice contains elements that are both specific to accreditation of individual engineering programmes and are generally applicable to the overall process of programme accreditation.

This exemplar is organised as follows:

Section 2 provides additional definitions of key terms.

Section 3 presents background material on best practice in accreditation.

Section 4 presents best practice for the constitution, scope and governance of an accreditation agency.

Section 5 identifies the criteria for accreditation in a system operating according to best practice.

Section 6 enumerates elements of best practice in the accreditation process itself.

Section 7 identifies elements relating to the agency's capacity for current operation and long term sustainability of the accreditation agency and its process.

Section 8 outlines continuous improvement practices expected of an agency.

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1 Adopted by the Ministers of Education of the Bologna Process at their meeting in Bergen in May 2005;

2 Section C.2.3.1-3: Criteria to be applied in admission of signatories; Section C.4.5: Indicators of satisfying the requirements laid out in C.2.3 for admission of Provisional Status bodies as Signatories.

2 TERMINOLOGY

2.1 Key definitions

In general, this exemplar follows the terminology in current usage in IEA and ENAEE documentation. Terms of particular importance in this best practice are as follows:

- **Accreditation** signifies both recognition given to a programme as meeting applicable criteria following an evaluation process, and the process itself.
- **Accredited** is used similarly to reflect the status of a programme evaluated as meeting applicable requirements.
- **Accreditation/accrediting agency** or **simply** agency used in this document means any authority, agency, association or institution performing the evaluation of programmes and granting recognition.
- **Accreditation board:** a board, council, committee or other body with authority to make accreditation decisions based on peer judgement.
- **Accreditation criteria** mean the full set of factors that are considered by an agency in evaluating the quality of a programme. Accreditation criteria include standards, that is, statements of assessable attributes to be displayed by graduates that indicate that the purpose of the programme has been achieved.
- **Accreditation process** embraces all phases: preparation for evaluation, the evaluation visit, reporting, decision making, publication of the decision and follow up, if required.
- **Engineering occupation** [or **role**] is used to signify recognised forms of engineering practice, for example professional or chartered or similarly titled engineers, engineering technologist or equivalently titled practitioners or engineering technicians.
- **Pathway:** A prescribed/defined arrangement of teaching, learning and assessment within a programme characterized by distinctive providers, sites or learning modes.
- **Programme:** A structured, integrated teaching and learning arrangement with a defined purpose, leading to the award of a qualification.
- The terms **programme outcomes** used in the EAFSG and **graduate attributes** used in the IEA context are taken to have the equivalent meaning with the following working definition:

  Programme outcomes/graduate attributes: are assessable learning outcomes describing or exemplifying the knowledge, skills and attitudes[3] expected of a graduate from an accredited programme that provides the educational foundation for a particular purpose including practice in a particular engineering occupation.

- The terms **self-assessment report** used in the EUR-ACE® context and **self-study report** use in the IEA Accords have equivalent meaning, with the following working definition:

  Self-assessment report/Self-study report: a quantitative and qualitative account prepared by an education provider prior to the on-site evaluation of a programme indicating the extent to which the programme meets applicable accreditation standards, criteria and covering all methods of programme delivery and all possible pathways to award of the qualification.

2.2 Conventions for defining best practice

The following conventions are used in expressing elements of best practice:

- Elements of best practice are stated in the present tense, for example: "The evaluation process includes an on-site evaluation".
- The words should and may are used to indicate where an element or aspect of best practice is considered advisable or permissible, for example: "The agency's geographic bounds may extend beyond its national boundary".
- Illustrative material is prefaced by **for example** or equivalent constructs.

This exemplar does not cover methods or techniques for implementing best practice.

3 The form knowledge, skill and attitudes is used as a general definition of graduate competence; understanding, which is an Anderson-Krathwohl level of engagement with knowledge and abilities, duplicates elements already present and is therefore avoided.

3 BEST PRACTICE: DEFINITION AND USAGE

A best practice[4] is defined for this document as a technique or methodology that has been proven through experience to reliably produce desired results. Acknowledged best practice therefore provides a benchmark for an accreditation system in evaluating programmes. A best practice does not preclude innovation, and it similarly does not preclude evolution to improved practices. Best practice does not therefore have an absolute unchanging definition. This document is therefore described as an exemplar of best current practice in the accreditation of engineering programmes.

This exemplar, consisting of the elements listed in sections 4 to 8, is intended for use in two principal ways. Bodies setting up as accreditation agencies or operating or improving engineering education accreditation systems will be guided by these elements. Bodies facilitating recognition of accredited engineering programs, such as ENAEE and the IEA Accords, both develop and are guided by best practice in defining, operating and improving policies, processes and accreditation criteria. The exemplar does not impact directly on education providers but rather helps to shape the accreditation system that each provider experiences.

Best practice described in this exemplar assumes particular relationships between the programme providers and the accrediting agency. The provider designs and executes a programme to satisfy a stated purpose. Execution involves resourcing and conducting a teaching and learning process, including assessment of students. Programme design is informed by the standards and other accreditation criteria laid down by the accrediting agency. The agency must not be involved in the design and delivery of the programme. Once a programme is in operation and producing graduates, the accrediting agency evaluates the programme against its standards using its defined processes.

The elements of best practice may be adapted into policies, processes and criteria by accreditation agencies and recognition bodies. The elements of best practice are those that have been found to ensure best functioning of accreditation systems.

The exemplar does not dictate policy to accreditation agencies as illustrated by the following examples:

- The IEA Accords requires the agency's geographic bounds of operation to be defined but does not prescribe particular bounds (see element 4.7).
- While element 5.2 lists the components of accreditation criteria that have become accepted best practice, accreditation agencies have freedom to determine the detail and the format of their criteria. For example, related elements may be packaged in a substantially equivalent form.

A recognition body, in stating its criteria for recognising an agency's process would be guided by section 6. A recognition body's criteria for a best practice accreditation process may, as in the case of section 5, use a substantially equivalent formulation.

4 In this document, best practice is not used in a superlative sense where superiority, optimality or ranking is assumed. Because the accreditation context for each accreditation agency will vary, comparisons of performance will often be of questionable value. Thus the definition of best practice used here ('proven through experience to reliably produce desired results') differs from that used in the 2015 edition of the document ('superior to those achieved with other means').

4 CONSTITUTION, SCOPE AND GOVERNANCE OF THE ACCREDITING AGENCY

Best practice accreditation systems may be operated by a range of types of agencies. Key characteristics for the constitution, scope and governance of accrediting agencies that are consistent with attaining best practice are listed below.

4.1 The agency is legally incorporated in its jurisdiction or is a properly constituted board or committee of a legal entity and, in either case, has an appropriate ownership and governance structure.

4.2 The agency is recognised within its jurisdiction a leading authority for accrediting engineering programmes.

4.3 The agency operates consistently and transparently in a defined relationship with any national or regional educational regulations, such as a qualifications framework, or quality assurance system.

4.4 The agency has a clear responsibility within its mission to accredit engineering education programmes whose primary purpose is to provide the educational base for independent practice in a defined engineering occupation.

4.5 The agency is independent and acts autonomously in respect of accreditation. It has full responsibility for its operations and accreditation decisions should be taken without third party influence.

4.6 The agency considers programmes for accreditation offered only by providers that have legal authority to operate and confer those degrees or other qualifications.

4.7 Geographic bounds of accreditation activity, if any, are defined, indicating any differences in standards, processes and levels of recognition of programmes if these are different in different territories.

4.8 The agency has the support of, and well-established links with, key stakeholders in the engineering academic and industry communities.

4.9 The agency makes accreditation decisions on a peer judgement basis.

4.10 The agency, staff and peer experts observe sound governance principles and act with professionalism.

4.11 Governance, evaluation and accreditation decisions should be made with balanced inputs from engineering peers from industry and education backgrounds drawn mainly from the jurisdiction where the engineering programmes operate.

4.12 Providers of education programmes, while key stakeholders in the accreditation agency, do not have a controlling power over standards, policies and accreditation decisions of the accreditation agency.

4.13 Functions and powers are clearly allocated to its boards, committees or other structures responsible for overall governance, determining standards, accreditation criteria and policies, evaluation of programmes and accreditation decision making.

4.14 An agency may delegate functions relating to the accreditation of programmes to appointed agents. The agency retains responsibility for the quality of the accreditation process and standards applied and their consistency. The agency should have in place a verification process with the delegated agents. The delegated agents are subject to this exemplar of best practice.

4.15 If the agency has mentoring procedures to help applicants for accreditation, these activities are clearly separated from the accreditation activities.

5 CRITERIA FOR ACCREDITATION

The agency has publicly available criteria for the evaluation and accreditation of programmes, which are applied in accordance with defined policies. Best practice relating to accreditation criteria includes:

5.1 The agency develops and reviews standards, criteria and policies by a process with engineering peer input and public comment, including that from relevant stakeholders.

5.2 Criteria to be satisfied by programmes to be accredited include the following:

a. The purpose of the programme includes providing a broad engineering educational base for a stated occupation.

b. The agency's standards defining the outcomes to be demonstrated by graduates:

I. are consistent with the educational objectives of the programme; and
II. are consistent with the IEA Graduate Attributes exemplar or the EUR-ACE® programme learning outcomes.

c. Student entry requirements are defined by the programme provider consistent with the demands of the curriculum, the preparedness of students at intake and expected progression.

d. The programme design is coherent and consistent with the purpose of the programme, including requirement 5.2.a, the stated student entry requirements and the programme learning outcomes to be met.

e. Student progression requirements are consistent with the entry level, curriculum and learning outcomes to be achieved.

f. Assessment of students comprises an appropriate combination of formative and summative assessment consistent with the planned student progression and target outcomes, in most cases including student performance in a culminating course item (such as a Capstone Project) that allows students who are nearing graduation to integrate and apply the knowledge and skills they have acquired to a major project or assignment.

g. A process exists to ensure that the assessment of individual students is of the required standard and is consistent, objective and fair.

h. The teaching and learning environment is appropriate to the programme objectives, programme structure, preparedness of the students at intake, and the stated outcomes, for example, as evidenced by: a progressive learning experience, development of independent and life-long learning, effective programme co-ordination, and monitoring student progress.

i. A suitable and adequately resourced environment to deliver the programme exists including:

I. Adequate and sustainable leadership that ensures effective and efficient planning and execution capability of the program.
II. Sufficient permanent teaching staff with the appropriate background training and experience.
III. Practitioners teaching in the programme have an appropriate combination of academic and professional qualifications and experience.
IV. Adequate supporting administrative and technical staff.
V. Adequate physical, financial and IT resources to support the programme.

j. Reviews (periodic or ongoing) and continuous improvement of the programme and its delivery are undertaken by the provider with input from students, employers, graduates and other stakeholders.

5.3 The accreditation criteria are defined in a way that gives the programme provider freedom to design and execute programmes to meet an outcomes-oriented graduate attributes standard.

5.4 The accreditation process requires the programme provider to account for the resulting quality of the curriculum and its execution, for attainment of the programmes learning outcomes/graduate attributes expected from the students and for continuous improvement of the programme.

6 THE ACCREDITATION PROCESS: THE METHODS AND MEANS OF DELIVERY

The process of accreditation of programmes, including preparation, evaluation, reporting and decision making, and follow up conforms to generally accepted principles, including:

6.1 Evaluation of programmes and accreditation decision making are based on appropriate, consistent and fair procedures, which are documented, self-consistent and support the evaluations of the programmes against the criteria for accreditation.

6.2 The accreditation system and the way that it is operated are robust, transparent, provide full information to all stakeholders while striking an appropriate balance of transparency and confidentiality in the accreditation process for individual programmes.

6.3 Written policies, standards, criteria and procedures are available to the education providers and to the public.

6.4 The accreditation process requires:

a. Pre-visit completion of a self-study/self-assessment report by the provider of the programme seeking accreditation using a structure and format specified by the agency to assemble information that demonstrates how the programme meets the accreditation criteria; the onus for such demonstration falls on the programme provider.

b. A curriculum description to be part of the self-study report and gives comprehensive information on all the modules in the programme.

c. Documentation to be provided to evaluators in time for adequate preparation for the visit.

d. Clearly specified evidence that must be available on-line before the visit and/or on-site during the visit.

6.5 The on-site or off-site visit schedule gives the evaluators time and opportunity to:

a. Gather, check and evaluate all required information including evidence of student attainment of the graduate attributes/programme learning outcomes.

b. Interview the main stakeholders of the programme (management, teachers, students, staff, alumni, employers).

c. Examine and evaluate the available facilities (including IT equipment, laboratories, infrastructure for student activities, etc).

d. Conduct private discussion, reflection and refinement of their evaluation as the visit proceeds.

6.6 Those involved in the accreditation process operate at all times in accordance with high standards of professionalism, ethics, impartiality and objectivity. They have access to adequate training, knowledge and competence in matters related to engineering accreditation, engineering education, the student experience and engineering practice.

6.7 The accrediting agency, its evaluators, observers, decision makers and staff observe confidentiality regarding information obtained in the course of the accreditation process. The findings of the evaluators are open to the education provider; in particular, potential adverse findings are raised with the provider and an opportunity given to provide additional information.

6.8 A clear conflict of interest policy exists for all involved in the accreditation process including selection of programme evaluation teams, accreditation decision-makers and policy-makers.

6.9 The agency has a policy on observers, including confidentiality requirements, restriction of influence on the process and participation protocols.

6.10 Evaluations of programmes are conducted by peer evaluators, with disciplinary knowledge of the programme(s) being evaluated and a suitable representation of engineering practitioners and academics.

6.11 Where the practice is to have one or more engineering student member(s) in the visiting team, the student or students contribute to evaluation of programmes in areas where they are competent

6.12 The evaluation process normally includes a visit to the programme provider's premises. Evaluations may be conducted without a site visit provided that process documentation exists for the off-site evaluation and the conditions under which they are permitted. Visits and evaluations are conducted in accordance with the agency's own published accreditation standards, policies and procedures within a framework of exercising peer-judgement. When appropriate, the evaluation process may consider groups of related programmes at the same time.

6.13 Programme evaluations are receptive to innovation in engineering technologies and teaching methods and do not inhibit the introduction of new subjects and ways of teaching.

6.14 If the accreditation process is performed jointly with another evaluation or quality assurance process, there are clear distinctions between the two sets of criteria and decision making. In this case a clear protocol describing the accreditation process is to be agreed upon.

6.15 In case the programme under evaluation is offered via multiple pathways, the pathway followed by a student is disclosed on the qualification certificate or academic transcript.

6.16 Each programme receives individual evaluation and accreditation decision.

6.17 The accreditation decision making process:

a. is based on accreditation criteria and standards, and allows decisions in a consistent and fair manner from institution to institution, programme to programme and year to year

b. is based on clearly defined set of allowed accreditation decisions, including proceeding to regular evaluations at predetermined intervals and interim evaluations under defined conditions.

c. is based on a rational approach to dealing with non-compliant programmes that encourages and verifies improvement of quality.

d. makes a judgement of the sustainability of the programme under review.

e. makes difficult decisions in a way intended to be beneficial to the engineering community in the longer term.

f. has a method of dealing with new programmes, extensively revised programmes involving substantial change during the period in which the programme is accredited, and with programmes being terminated.

g. includes periodic re-evaluation to maintain accreditation status and a follow-up process when the recommendations and decisions so dictate.

6.18 The accreditation process provides for the right of reply on factual matters by authorized officials of the provider, for example dean or head of programme, before the accreditation recommendation or decision is made.

6.19 A process for appealing adverse accreditation decisions is available involving only persons with no prior involvement in the decision being appealed and no conflict of interest.

6.20 The agency follows defined reporting protocols. In particular:

a. Evaluation reports provide sufficient detail for its Accreditation Board (or equivalent) to make informed decisions whether to accredit, accredit with conditions imposed, or not to accredit particular programmes.

b. Reports use standardised methods of recording recommendations and decisions. Clearly defined keywords such as best practice, deficiency, weakness, concern, comply, commend, observation are used.

c. While evaluation templates or questionnaires may be used, the team's finding are clearly recorded and developed in report form. Recommendations and decisions are based on accreditation criteria and evidences.

d. The agency provides a written report to the institution that clearly distinguishes between actions required for the provider to reach or maintain accreditation and actions recommended for academic programme improvement.

6.21 The agency publishes or makes available to the public a list or searchable database of accredited programmes that clearly identifies each programme for which an accreditation decision has been made and the period of validity of the accreditation. The agency's policy may require publication of its programme evaluation reports including the rationale for their decisions or other information, subject to any limitations arising from confidentiality and other relevant considerations.

6.22 Substantial changes to the accreditation system's standards, criteria, policies or procedures are managed in a way realistic and beneficial to all stakeholders.

7 THE AGENCY'S CAPACITY TO CONDUCT ACCREDITATION ACTIVITIES

Accreditation of engineering programmes requires resources to implement and to sustain an accreditation system. Delivery of education programmes are typically sustained over a long period so the accreditation process must also be sustained as long as an engineering programme is delivered. The essential components of this capacity are:

7.1 The agency has sufficient and sustainable funding prospects to support an effective and sustainable accreditation system.

7.2 The agency has sufficient appropriately skilled staff to manage and operate the accrediting process effectively.

7.3 Adequate numbers of qualified engineering peers with academic and industry backgrounds are available for appointment to the accreditation board and its substructures, if present.

7.4 A corps of experienced evaluators is available in all the disciplines in which programmes are put forward for accreditation and to be team chairs and visit chairs.

7.5 An effective process is applied for the recruitment, selection, training and appraisal of programme evaluators. Appropriate eligibility criteria are applied in the selection of evaluators.

7.6 An effective training process for evaluators is in place and is supported by written training materials.

7.7 The agency must operate independently from external financial, operational or governance influence.

8 QUALITY ASSURANCE AND CONTINOUS IMPROVEMENT OF THE ACCREDITING AGENCY

To best serve its constituencies, the accreditation agency's own system and practice must remain relevant and in high quality. To this end, the accreditation agency must have in place policies and mechanisms for internal and external quality assurance exercises, which demonstrate a continuing effort to improve the quality and integrity of its practices.

8.1 The accreditation agency benchmarks its criteria and processes and carries out periodic self-review to improve its standards, criteria, policies and procedures. Methods may include the use of international evaluators and observation of other agency's processes.

8.2 The agency's procedures ensure that its criteria and processes are subject to reasonable consultation with stakeholders at regular intervals and are updated as necessary to reflect the changing needs of engineering education and the engineering profession.

8.3 The agency is subject to periodic international external reviews by peer organizations to demonstrate its integrity, relevance, and substantial equivalence in quality with peer organizations.

8.4 The results of the internal and external reviews are used to inform decision-making and trigger improvements of the agency. Implementation and evidence of improvement based on the results of the reviews must be an integral part of the agency's practices.

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