INSTITUTION OF ENGINEERS, BANGLADESH

BOARD OF ACCREDITATION FOR ENGINEERING AND TECHNICAL EDUCATION

Accreditation Manual

for

Undergraduate Engineering Programs

June 2022

Effective from 7 June 2022

Edition 2.1

www.baetebangladesh.org

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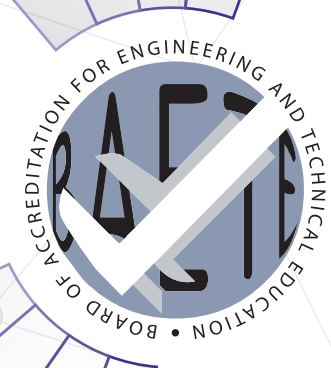

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An Overview of Changes in Edition 2.0

1. Section 4.6:
   a. Year-long Final Year Design Project or Capstone Project is no longer obligatory in the curriculum. Demonstration of culminated POs in solving complex engineering problems remains required, and the year-long Final Year Design Project or Capstone Project is the *preferred* method.
2. Section 4.8:
   a. The descriptions of POs have been updated following IEA Version 3.21, June 2013. Requirements of the Knowledge Profiles (K1-K8) have been explicitly mentioned in the description of each PO.
   b. The tables describing the Range of Complex Engineering Problem-Solving and Range of Complex Engineering Activities have been updated following IEA Version 3.21, June 2013.
   c. The program should map out how each attribute of the Knowledge Profile (K1 – K8) is addressed in the curriculum. The program should also demonstrate how each attribute of the Range of Complex Engineering Problems (P1 – P7) and Complex Engineering Activities (A1 – A5) is incorporated in teaching, learning and assessment.
   d. Results of evaluation of PO attainment should be reported.
3. Chapter 7:
   a. Format of the SAR has been updated.
   b. Sections 7.2, 7.3: New sections added on guidelines for preparing the SAR.
   c. Template of the SAR has been revised putting more emphasis on narration of the policies and processes and justifications.
   d. Template for Criterion 8 has been updated in line with the revisions made in Section 4.8 of the manual.

An Overview of Changes in Edition 2.1

1. Section 1.3.2:
   a. The composition of the BAETE has been updated in view of the changes approved at the 63rd AGM of the IEB.
2. Chapter 4:
   a. The required and desired attributes of each of the ten criteria, in terms of sub-criteria, has been listed. The required attributes are indicated through the word *must*, while the desired attributes are indicated through the word *should*.
   b. Section 4.8: Titles for the POs have been removed.
   c. Reference to Annex III Evaluation Team Report (ETR) template has been added in the first paragraph of chapter 4.
3. Section 5.1:
   a. The definition of non-compliance, for the purpose of reporting in the exit meeting, has been added in 5.1.7.
   b. Reference to the Annex III containing the ETR template has been added in 5.1.9.
4. Chapter 7:
   a. Format of the SAR has been updated. Section 1.7 (Alumni association) has been moved out of criteria 1 and placed under criteria 10 as section 10.2. Section 5.6 (Safety and health measures in the laboratories) has been moved out of criteria 5 and placed under criteria 2 as section 2.5.
5. Annex III:
   a. Annex III is a new chapter and it presents the report template to be used by the evaluation team.

In terms of accreditation requirements, edition 2.0 and edition 2.1 are equivalent.

Prepared by

Board of Accreditation for Engineering and Technical Education, Bangladesh
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LIST OF ABBREVIATIONS

AA	Alumni Association
BAETE	Board of Accreditation for Engineering and Technical Education
BAU	Bangladesh Agricultural University
BPERB	Bangladesh Professional Engineers Registration Board
BUET	Bangladesh University of Engineering and Technology
BUTex	Bangladesh University of Textiles
BDT	Bangladesh Taka
CE	Civil Engineering
CEE	Civil and Environmental Engineering
ChE	Chemical Engineering
CSE	Computer Science and Engineering
CLO	Course Learning Outcome/Course Learning Objective
CO	Course Outcome
COs	Course Outcomes
CQI	Continuous Quality Improvement
CUET	Chittagong University of Engineering and Technology
CV	Curriculum Vitae
DUET	Dhaka University of Engineering and Technology
ET	Evaluation Team
EE	Electrical Engineering/ Environmental Engineering
EEE	Electrical and Electronic Engineering
ETE	Electronic and Telecommunication Engineering
Engg.	Engineering
GA	Graduate Attributes
H	High
IEB	Institution of Engineers, Bangladesh
IEP	Institute of Engineers, Pakistan
IPE	Industrial and Production Engineering
IAP	Industry Advisory Panel
IT	Information Technology
ID	Identity
KUET	Khulna University of Engineering and Technology
L	Low
LL	Level of Learning
ME	Mechanical Engineering
MME	Metallurgical and Materials Engineering
M	Medium
NAME	Naval Architecture and Marine Engineering
NA	Not Accredited
OBE	Outcome-based Education
OBA	Outcome-based Accreditation
Ph.D	Doctor of Philosophy

LIST OF ABBREVIATIONS

Pro-VC	Pro-Vice Chancellor
PC	Personal Computer
PO	Program Outcome
POs	Program Outcomes
PEO	Program Educational Objective
PEOs	Program Educational Objectives
POA	Program Outcomes and Assessment
RJSC	Registrar of Joint Stock Companies
RUET	Rajshahi University of Engineering and Technology
R&D	Research and Development
SC	Sectoral Committee
SAR	Self-Assessment Report
TE	Textile Engineering
TSR	Teacher-Student Ratio
UG	Undergraduate
UGC	University Grants Commission
URL	Uniform Resource Locator
VC	Vice Chancellor

CHAPTER

Introduction 1

Institution of Engineers, Bangladesh 1.1

The Institution of Engineers, Bangladesh (IEB) was founded as the Institute of Engineers, Pakistan, which was registered on May 7, 1948, by the Registrar of Joint Stock Companies, East Bengal. It was recognized as the representative body of qualified engineers when its constitution was ratified by the government of what was then Pakistan in September 1952. After Bangladesh emerged as an independent country in 1971, the society's name was changed from the Institute of Engineers, Pakistan, to the Institution of Engineers, Bangladesh. The new organization was registered by the Registrar of Joint Stock Companies, Government of the People's Republic of Bangladesh, in July 1972.

To become a member of IEB and provide professional services in Bangladesh, an individual must hold an engineering degree recognized by IEB. Additionally, IEB oversees the growth and quality of engineering education in Bangladesh. To this end, the IEB constitution encompasses the accreditation of programs within the country that award engineering degrees.

Objectives of Accreditation 1.2

In general, the accreditation of a program recognizes and acknowledges the value of transforming a student into a capable engineer with sound knowledge of fundamentals and an acceptable level of professional competence. The accreditation process is also significant as a means of promoting quality by encouraging healthy competition among different degree programs at the same institution and among similar programs at different institutions.

The specific objectives of accreditation are as follows:

a. To ensure that graduates acquire the attributes required to meet national and international standards;
b. To assist all stakeholders in identifying specific engineering education programs that meet national and international standards; and
c. To provide a mechanism for the continual improvement of existing engineering programs through evaluation and feedback.

1.3 Board of Accreditation for Engineering and Technical Education

1.3.1 Formation, Authorities and Functions

The Board of Accreditation for Engineering and Technical Education (BAETE) was established by IEB in accordance with provision enshrined in IEB constitution. BAETE, thereafter referred to as "the Board", is empowered to function as an independent and autonomous body to establish the policy, procedure, criteria, and related systems to conduct engineering program accreditation.

1.3.2 Composition and Terms of Office

The Council of IEB nominates the Chairman and the members of the first Board. Nominations to subsequent Board positions may be made by the president of IEB in consultation with the outgoing Chairman of the Board and other professionals/experts in the field. The structure of the BAETE is as follows.

Chairman	1
Vice-chairmen	2
Vice-president (Academic and International Affairs), IEB [Ex-Officio]	1
Honorary General Secretary, IEB [Ex-Officio]	1
Chairman, BPERB, IEB [Ex-Officio]	1
Vice-chancellor BUET or his nominee at the level of Senior Professor	1
Chairman/Member of UGC (with background in Science/Technical Education)	1
Three Vice-chancellors from DUET/RUET/KUET/CUET/BUTex/BAU or their nominees at the Senior Professor level	3
Two members from private universities with at least one BAETE-accredited program	2
One representative of Ministry of Education not below the rank of Additional Secretary (with a background in Science/Technology) in the Government of Bangladesh	1
Representation from Industry	1
R&D establishments	1
Eminent educationists	5
Member-Secretary	1
Total	**22**

The term of office for the Chairman, Vice-Chairman and members who are not “ex-officio” is four years. The Board meets to discuss administrative issues at a time, place and frequency chosen by the Chairman. The Board meets three times per calendar year, in January, May and September, to make decisions regarding accreditation applications.

Management and Finance 1.3.3

The Board maintains an office (the Secretariat of the Board) in the IEB Headquarters Building at Ramna, Dhaka. A full-time Registrar and a full-time Executive Assistant hold offices to maintain records and assist the Board with its activities.

In principle, the BAETE is a financially self-supporting body that obtains its funds mainly from fees from accreditation applications. Budget deficits, if any, are met by IEB. The BAETE also welcomes contributions from industries as part of their corporate social responsibility.

Sectoral Committees 1.3.4

The Board constitutes Sectoral Committees for different engineering programs under broad sectors (or disciplines) such as Civil Engineering, Electrical Engineering, Computer Science and Engineering, Mechanical Engineering, and Chemical Engineering. The Board also defines new sectors as necessary. Each committee comprises three members, one of whom serves as the Chair, who are experts in the sectoral disciplines and are appointed usually for a period of three years.

Sectoral Committee members should be well versed with the accreditation systems and the particular requirements of program-specific criteria in the relevant sectoral disciplines. No member of the Sectoral Committee should be a member of a current Evaluation Team or the Board.

Sectoral Committees are responsible for scrutinizing the evaluation reports in the relevant disciplines to maintain consistency of evaluation and to ensure compliance with accreditation policy, procedure and criteria. The Sectoral Committee submits its independent recommendations to the Board together with the report of the Evaluation Team. A Sectoral Committee member may accompany the Evaluation Team to act as a resource person for on-site moderation to avoid procedural discrepancies, but shall not participate in the direct program evaluation.

Appellate Committee 1.3.5

If an institution is not satisfied with the Board's accreditation decision, it may apply for a review of the decision by an Appellate Committee. The Appellate Committee is an independent committee consisting of three members, including the Chair. Its members are selected from among the former Board members, former Sectoral Committee members, and former Evaluation Team Chairs and are appointed by the IEB President after discussion with the Chair of the IEB Ethics Committee. The tenure of the Appellate Committee is three years.

CHAPTER

Accreditation Policy 2

Eligibility for Accreditation 2.1

A program must fulfill the following requirements to be considered for accreditation:

a. An engineering degree-awarding program approved by an appropriate authority, namely, the UGC or any other appropriate government body.
b. A duration of four years after twelve years of schooling.
c. At least one cohort has graduated from the program.
d. Program pedagogy follows outcome-based education.[1]
e. Requires a minimum of 130 total credit hours.[2]

The following should be noted:

i. Accreditation is voluntary and programs are considered for review and accreditation only at the written request of the educational institution.
ii. Accreditation is granted only to programs and not to the institution as a whole.
iii. The same program offered at different campuses of an institution must be accredited separately at each campus.
iv. The degree title of a BAETE-accredited program must properly reflect the content of the education provided, including the field of specialization, and it must appear on all formal documents issued by the institution (e.g., transcripts, certificates of graduation, and certificates of enrollment).
v. The program and degree title(s) of non-accredited program(s) offered by the same institution must be clearly distinguishable from those of an accredited program.
vi. No changes in the name/title of an accredited program shall be made without the prior approval of the BAETE.

[1] Outcome-based education (OBE) is an educational theory that bases each part of an educational system on goals (outcomes).

[2] Definition of Semester Credit Hour

Lecture Classes: One semester credit hour will be awarded for a minimum of 750 minutes of formalized classroom instruction (contact hours) in a semester. Laboratory Classes: One semester credit hour will be awarded for a minimum of 1500 minutes of classroom/laboratory/studio/project/dissertation (contact hours) in a semester.

2.2 Preliminary Evaluation of New Programs

A new program may ask the BAETE to evaluate its strengths, weaknesses, opportunities for and concerns for future accreditation when its most senior cohort is in its second year. The Evaluation Team will identify strengths, weaknesses, opportunities and concerns in its report without expressing approval or disapproval of the program.

2.3 Evaluation

The evaluation of a program shall be conducted in accordance with the criteria presented in Section 4. The evaluation process includes the examination of the information provided in the Self-Assessment Report (SAR) and the Evaluation Team's findings from an on-site visit.

2.4 Accreditation Decisions

The Board will make an accreditation decision about a program based on the recommendations of the Evaluation Team and the relevant Sectoral Committee. The quality evaluation of a program is based on a holistic judgment in relation to the stipulated accreditation criteria regarding compliance, concerns, weaknesses and deficiencies.

The maximum accreditation period shall be six years if there is no deficiency and no weakness in any of the criteria. The Board may accredit a program for a shorter period if the program's overall assessment is acceptable and it does not have weaknesses in more than three criteria. The actual duration of an accreditation period may also depend on the extent of weaknesses and/or concerns. A program may not be accredited if any deficiency in any criterion is identified. If a program is not granted accreditation, the institution may reapply one year later after addressing the deficiencies and weaknesses. Normally, a program's accreditation commences from the date its application is submitted to the BAETE. However, a new program applying within twelve months of the graduation of its first cohort may be granted retrospective accreditation starting one calendar year before the application date to include the first graduated cohort.

2.5 Deferment of Accreditation

If the Evaluation Team finds any deficiency in the program that can be corrected within a short period, the Team may recommend to the Board, through the Sectoral

Committee, for a Deferment of Accreditation for a specified time not exceeding twelve months. The institution may reapply within the specified time period without having to wait the minimum one year required in the case of a "Not Accredited" decision.

Renewal 2.6

An institution may apply for the renewal of a program's accreditation by submitting an application at least six months before the expiration of the current accreditation. The application must be accompanied by an SAR, which should include an account of the shortcomings identified by the previous Evaluation Team and the extent to which these shortcomings have been addressed. Significant improvements that have been achieved since the last accreditation visit, particularly through the continuous quality improvement mechanism, should be highlighted. All other processes, including the on-site visit and the decision-making process, shall be the same as noted for the first accreditation.

Expenses and Fees 2.7

The educational institution must pay the appropriate fees when submitting an accreditation application. The fee structure is provided on the BAETE website. Moreover, all visit-related expenses, including transportation, food and lodging, will be borne by the educational institution.

Confidentiality 2.8

All information provided for accreditation by the institution, including the SAR and all on-site observations and findings, are confidential. This information may not be revealed to any unauthorized persons under any circumstances without written permission from the concerned educational institution. Similarly, the institution may not reveal any part of the Evaluation Team's report to any unauthorized person or to the public without explicit written permission from the BAETE.

Conflicts of Interest 2.9

Service as a BAETE board member, Sectoral Committee member or Evaluation Team member should not create situations that may result in conflicts of interest or questions regarding the objectivity and credibility of the accreditation process. Each individual involved in the BAETE accreditation process is required to behave in a professional and ethical manner and to disclose real or perceived conflicts of interest. Examples of conflicts of interest include, but are not limited to, the following situations: being a

current or former faculty or staff member at the concerned institution, serving as a member on any committee at the concerned institution, current or previous involvement in any for-profit activity with the concerned institution, and having a dependent who is a student at the concerned institution.

CHAPTER

Accreditation Procedure 3

Introduction 3.1

Application for the accreditation of an engineering program must be made formally in writing through the head of the institution. The application must be accompanied by an SAR duly completed in accordance with the format described in Section 7.0 of this manual. The accreditation process commences upon verification of the accreditation fee payment and receipt of the SAR.

The accreditation decision is made by the Board following a rigorous evaluation process involving a review of the SAR, an on-site visit by the Evaluation Team and a review of the Evaluation Team report by the Sectoral Committee.

Steps in the Accreditation Process 3.2

The steps involved in the accreditation process are as follows. All communications at every step should occur through the Registrar, BAETE.

1. Submission of the application
2. Formation of the Evaluation Team
3. Communication to the institution about the formation of the Evaluation Team
4. Communication of the institution's reservations about any member of the Evaluation Team, if any
5. Review of the SAR
6. On-site visit
7. Submission of Evaluation Team report
8. Scrutiny by the Sectoral Committee
9. Response of the institution to factual matters
10. Recommendation of the Sectoral Committee
11. Decision of the Board
12. Communication of the decision to the institution

Annex I provides a schematic flow chart of the steps. The maximum time allocated for each step is shown in the following table.

Steps	Maximum allocated time
Formation of the Evaluation Team	3 weeks
Communication of the institution's reservations	1 week
On-site visit	12 weeks
Report of the Evaluation Team	3 weeks
Scrutiny by the Sectoral Committee	2 weeks
Response of the institution to factual matters	1 week
Recommendation of the Sectoral Committee	2 weeks
Decision of the Board	16 weeks

3.3 Application and Submissions

The institution must submit separate application(s) in the prescribed format for the accreditation of each of its eligible programs. The application must accompany a completed SAR and other information/documents as stated in Section 7.0.

If a program's accreditation is about to expire, the institution must apply for re-accreditation by submitting an application at least six months before the current accreditation expires.

3.4 Formation of the Evaluation Team

An Evaluation Team consisting of a Chairperson and two members will be formed by a sub-committee of the Board within three (3) weeks of receiving a completed application package for accreditation. The Chairperson will be a senior academic or a practicing professional in a relevant engineering discipline with adequate experience in the accreditation process. At least one of the members will be from the industry. The Chairperson and team members shall be selected from a pool of qualified evaluators. Upon notification of the formation of the Evaluation Team, the institution may express reservations in writing about any member who may have a conflict of interest, as per Section 2.9, within one (1) week. The specific reason must be cited. The Evaluation Team members are required to declare possible conflicts of interest with the program and the institution, if any, and to abide by the code of confidentiality and professional conduct.

3.5 Pre-visit Activities

The Evaluation Team will first review the submitted SAR. If the SAR indicates significant deficiencies in the program and/or the institution, the Evaluation Team may decide not to recommend the program for accreditation without performing the on-site

visit. When the SAR indicates that the program is eligible for accreditation, the Chairperson of the Evaluation Team will contact the institution through the BAETE Registrar to arrange the accreditation visit.

Accreditation Visit 3.6

The Evaluation Team will conduct a three-day visit within twelve (12) weeks of its formation.

3.6.1 The on-site visit allows the Evaluation Team to assess factors related to the accreditation criteria that may not be adequately described in the SAR and to obtain further clarifications from the educational institution. Although it is not possible to adequately describe all the factors to be assessed during the on-site visit, some common factors include the following:

a. Objectives and outcomes of the education provided
b. Quality assurance processes, including internal reviews
c. Assessment of student learning outcomes
d. Student activities and work
e. Entry standards for admission and student selection
f. Faculty members' motivation and enthusiasm
g. Faculty members' qualifications and activities
h. Facilities
i. Industry participation

3.6.2 To assist the Evaluation Team in its assessment, the educational institution should arrange the following:

a. Meetings with:
   i. The Head of the institution, the Dean and Head of the Department, and relevant program and course coordinators
   ii. A member of the senior administration/management, preferably the Head of the institution, to discuss how the program fits into the university's overall strategic direction and focus and the management support available for the continued resourcing and development of the program
   iii. A group of faculty members
   iv. A group of supporting staff and heads of the support/service departments
   v. A group of employee representatives
   vi. A group of alumni
   vii. A group of students

b. Availability of the following documents for examination:
   i. Curriculum vitae of all program faculty members

ii. Evidence that the results of the course and program outcome assessment are being used to review the program and ensure ongoing improvement
iii. Lists of publications by all program faculty members
iv. Sample teaching materials
v. Sample examination papers, quizzes and class tests for all subjects
vi. Sample examination scripts, including at least one excellent, one good and one marginal pass for each examination
vii. Transcripts of immediate past graduates, including those granted advanced standing and those who were in the part-time program if applicable
viii. Sample student project and design reports (excellent, good and marginal pass)
ix. Sample student feedback form
x. Results of other internal or external reviews of the program, department and faculty
xi. Quality assurance review results
xii. Records of meetings of committees relevant to the program
xiii. Records of meetings with stakeholders
xiv. Graduates' employment records
xv. Any other documents that the Evaluation Team may request

c. Visits to:
i. Faculty office rooms
ii. Classrooms
iii. Laboratories, especially those used for undergraduate courses
iv. The library
v. IT facilities
vi. Career/placement center, co- and extra-curricular facilities, medical facilities
vii. Canteen
viii. Washrooms/toilet facilities

3.6.3 At the end of the on-site visit, the Evaluation Team will hold an exit meeting to present its preliminary findings to key personnel of the educational institution, including the Head of the institution and the Head of Department/Chair of School for the program being evaluated.

3.7 Post-visit Activities of Evaluation Team

The Evaluation Team will submit its evaluation report to the BAETE Registrar within three (3) weeks of the visit. In finalizing its report with findings and recommendations, the Evaluation Team may consider additional submissions requested from the institution during the on-site visit. The Evaluation Team will make a holistic quality judgment of each criterion against the benchmark requirements stipulated in this

manual in terms of compliance, concern, weakness and deficiency. These terms are defined as follows.

Compliance: A criterion, policy, or procedure has adequately satisfied the benchmark requirements stipulated in the manual. No corrective measure is required to strengthen compliance prior to the next review.

Concern: A criterion, policy, or procedure is broadly in compliance but requires improvement to avoid compromising the quality of the program or is currently in compliance but the potential exists for the situation to change, resulting in future non-compliance. Progress on the corrective measures is required prior to the next review.

Weakness: A criterion, policy, or procedure lacks compliance, compromising the quality of the program. Corrective measures are required to strengthen compliance prior to the next review.

Deficiency: A criterion, policy, or procedure either does not exist or is in the elementary stage. Compliance is required.

The findings and recommendations of the Evaluation Team must be supported with evidence. Although the Evaluation Team should not prescribe the details of the corrective measures to be taken, some broad-level recommendations and suggestions are required. The evaluation report may briefly highlight the strengths of the program and the institution as encouragement and in recognition of good practices.

Scrutiny by Sectoral Committee 3.8

The Evaluation Team's report will be moderated for consistency and procedural discrepancies by the relevant Sectoral Committee within two (2) weeks of submission. If the Sectoral Committee identifies areas of inconsistency or procedural discrepancies, the Evaluation Team will be asked to provide clarification and/or revise the report.

Response of Institution 3.9

The moderated report will be shared with the institution, which may submit a written response regarding any factual error in the report within one (1) week. The educational institution does not have the right to require a change in the report but may note any statement that may be incorrect or provide comments. The Sectoral Committee will submit the institution's response along with the Evaluation Team's report and its recommendation to the Registrar of BAETE to table for decision making at the next BAETE board meeting. The Evaluation Team will receive a copy of the moderated

report along with the institution's response and the Sectoral Committee's recommendation.

3.10 Decision Process

The Board will make the final decision regarding the application for accreditation primarily based on the findings and recommendations of the Evaluation Team, with moderation by the Sectoral Committee. In making its decision, the Board will adhere to the published accreditation policy and procedure and ensure the consistency of discipline-specific program criteria across different institutions.

The Board will make a decision within sixteen (16) weeks from the date the recommendation of the Sectoral Committee is submitted. The accreditation decision will be communicated to the concerned institution.

3.11 Follow-up Action as a Requirement for Accreditation

If follow-up action is required as a condition for accreditation, the BAETE will require the educational institution to submit a report within a specified period. The specified period will vary depending on the nature of the requirement and whether the follow-up actions can be developed and implemented within a short time frame. The BAETE may also require a follow-up visit to review the actions taken by the educational institution. The educational institution must meet all direct costs associated with the follow-up visit.

3.12 Dispute Resolution

An institution may appeal the accreditation decision in writing within two (2) weeks of receiving the decision and paying a prescribed fee. An appeal may include a request for re-consideration or a revisit and should be accompanied by a report to substantiate the request. The appeal will be submitted to the Appellate Committee for deliberation.

The Appellate Committee may invite the institution filing the petition and the members of the Evaluation Team to present their positions. Appellate Committee itself will determine its methods of operation, giving due consideration to the substance of the appeal petition. The Appellate Committee may ask the BAETE to consider the appeal based on the SAR submitted by the institution. BAETE should respond to its recommendations within one (1) month. The Appellate Committee will make the final decision within three (3) months after receiving the appeal petition. If the petition is denied, the Appellate Committee will provide the institution with reasons for the denial.

CHAPTER

Criteria 4

This section presents the ten accreditation criteria which are the basis for evaluating a program for accreditation. The following sub-sections sequentially outline the required and desired attributes of each criterion in terms of sub-criteria. Required attributes are indicated through the word *must*, while the desired attributes are indicated through the word *should*. This section does not provide any quantitative bench-mark requirement to satisfy a criterion or sub-criterion adequately or appropriately. Adequacy or appropriateness is to be decided qualitatively in consideration of what is necessary for the students to attain the outcomes. It should be noted that no sub-criterion is assigned any weight. Each criterion is to be holistically evaluated in terms of the qualitative bench-mark requirements. The report template that the evaluation teams will use is given in Annex-III.

Organization and Governance 4.1

Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. Major positions of the institution must be filled. These positions include Vice Chancellor, Pro-Vice Chancellor, Treasurer, Dean, and Chairperson.
ii. The statutory bodies/committees of the institution must be formed in accordance with the applicable rules and guidelines. These bodies/committees include the Board of Trustees, Syndicate, Academic Council, Admission Committee, Finance Committee, Curriculum Committee, and the Faculty Selection Committee.
iii. The position appointees and committee members must function effectively as per the roles defined in the relevant act/statute.
iv. The institution must have published policies, including a mechanism for addressing grievances, regarding academic and administrative matters involving students, faculty members and non-teaching employees.
v. The academic and administrative policies must be put into practice.

Financial and Physical Resources 4.2

Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. The financial resources of the institution must be adequate to fulfill its mission and vision. The financial resources committed to the program must also be adequate for the appropriate functioning of the program, including recruiting and retaining qualified faculty members, and procuring the necessary lab equipment and equipment and tools to support teaching and learning.
ii. The institution must have a process for budget planning and allocate resources to the priority areas as required.
iii. The campus infrastructure, such as the extent of the land and built-up area, extra- and co-curricular facilities, and support facilities, including maintenance support for infrastructure and facilities, must be adequate for the total number of students and employees at the institution.
iv. The possibility of any risk from manmade or natural hazards should be properly assessed and addressed in the Safety Plan, which must address safety issues as the situation demands. Adequate measures must be in place to make the campus safe for students, employees and visitors.
v. Fire detection and firefighting facilities must be adequate.
vi. All labs must have their own plans to prevent and manage incidents and accidents.

4.3 Faculty

Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. The department must have a sufficient number of full-time faculty members to ensure that the faculty are not overloaded with courses and that the program does not become overly dependent on part-time faculty members.
ii. The proportion of senior faculty members and junior faculty members should be appropriate.
iii. Adequate interaction between students and faculty members both within and outside classes is essential. The teacher-student ratio, class size and teaching load must not compromise opportunities for interaction.
iv. The faculty members must have adequate academic qualifications with specializations in areas closely related to the program(s) offered by the department.
v. Faculty members should be motivated to improve their pedagogy and assist the students in achieving outcomes. They should be committed to the continuous quality improvement activities of the department.

vi. Faculty members must have the responsibility and authority to design and update the curriculum, establish course and program outcomes, and select and use appropriate assessment tools for evaluating student performance in classes and the achievement of outcomes.

vii. Faculty members must be engaged in research, development and professional activities such as consulting. They should also be involved in relevant professional societies. The results of these activities should benefit the students.

viii. The institution or department must periodically arrange training for the faculty members on outcome-based education and assessment. All the faculty members must be adequately trained on how to establish course outcomes, conduct teaching-learning activities that are appropriate for the outcomes and assess the level of outcome achievement.

Students 4.4

Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. There must be a published policy for the admission and transfer of students into the program. The admission or transfer requirements should be appropriate for the selection of students with the potential to achieve the program's outcomes.

ii. The policy must be implemented in practice. Transfer students must also show the attainment of program outcomes from courses in the institution.

iii. Students' academic performance must be continuously monitored in terms of the achievement of outcomes, and feedback should be provided to the students. There should be provisions for remedial or corrective measures when necessary.

iv. Every student must be assigned an advisor. The advisor should counsel, guide and mentor the student on all academic and professional matters.

v. Students must have opportunities to participate in extra- and co-curricular activities and the activities of relevant professional societies. The institution should ensure the participation of a significant number of students.

Academic Facilities and Technical Support 4.5

Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. The institution must have a well-stocked library. The books, e-books, journals and other resources available in the library should be adequate for the program and the faculty members.
ii. The number of classrooms available must be adequate to properly run the program. The classroom facilities and the environment should be conducive to learning.
iii. The number of laboratories and equipment must be adequate for conducting the program's various laboratory courses.
iv. Every student must have the opportunity for hands-on activity in the laboratories.
v. Students and faculty members must have access to adequate computing and Internet facilities, including hardware, software tools and support.

4.6 Curriculum and Teaching-Learning Processes

Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. The curriculum must satisfy the relevant program-specific criteria.
ii. The breadth and depth of the curriculum must be appropriate for solving complex engineering problems in the relevant discipline.
iii. The curriculum must contain an adequate number of courses on mathematics, physical science, humanities and non-engineering subjects.
iv. The teaching-learning processes and activities selected for each course must be effective and appropriate for achieving the relevant outcomes including solution of complex engineering problems and activities, if applicable.
v. Adequate hands-on activities must be an integral part of teaching and learning. Learning should be enhanced through student participation.
vi. The program must demonstrate the culmination of program outcomes (POs) at the level of solving complex engineering problems, preferably through a final-year design project or capstone project extending over a period of one year.

4.7 Program Educational Objectives

Program Educational Objectives (PEOs) are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. PEOs are assessable based on the attributes and accomplishments of graduates, preferably those who have worked for 3 to 5 years after graduation. Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. Published PEOs must be clear, concise, assessable and realistic within the context of the available resources.
ii. PEOs must be consistent with the vision and mission of the institution or the department offering the program.
iii. Curriculum and teaching-learning processes must support the attainment of PEOs. Justifications must be provided for how these contribute to the attainment of the PEOs.
iv. A process must be developed to assess the level of attainment of each PEO to evaluate the academic program's effectiveness. Adequate evidence and documentation on the assessment of PEO attainment must be provided. The assessment tools should be indicated, and the way in which these tools are used should be explained.
v. PEO assessment must lead to the periodic review of PEOs.

Program Outcomes and Assessment 4.8

Program Outcomes (POs) or graduate attributes are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These statements relate to the knowledge, skills and attitudes acquired by students while progressing through the program. The program must demonstrate that by the time of graduation, students have achieved an acceptable minimum level of certain knowledge, skills and behavioral traits. The BAETE specifically requires that students acquire the following graduate attributes:

a) Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in K1 to K4 respectively to the solution of complex engineering problems.
b) Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (K1 to K4)
c) Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (K5)
d) Conduct investigations of complex problems using research-based knowledge (K8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
e) Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (K6)

f) Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (K7)
g) Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (K7)
h) Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (K7)
i) Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
j) Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k) Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
l) Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

In addition to incorporating the above-listed POs (graduate attributes), the educational institution may include additional outcomes in its learning programs. An engineering program that aims to attain the abovementioned POs must ensure that its curriculum encompasses all the attributes of the Knowledge Profile (K1 – K8) as presented in Table 4.1 and as included in the PO statements. The ranges of Complex Problem Solving (P1 – P7) and Complex Engineering Activities (A1 – A5) are given in Tables 4.2 and 4.3, respectively.

Table 4.1: Knowledge Profile

	Attribute
K1	A systematic, theory-based understanding of the natural sciences applicable to the discipline
K2	Conceptually based mathematics, numerical analysis, statistics and the formal aspects of computer and information science to support analysis and modeling applicable to the discipline
K3	A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline
K4	Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline

K5	Knowledge that supports engineering design in a practice area
K6	Knowledge of engineering practice (technology) in the practice areas in the engineering discipline
K7	Comprehension of the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the engineer's professional responsibility to public safety; the impacts of engineering activity; economic, social, cultural, environmental and sustainability
K8	Engagement with selected knowledge in the research literature of the discipline

Table 4.2: Range of Complex Engineering Problem Solving

Attribute	**Complex Engineering Problems** have characteristic P1 and some or all of P2 to P7:
Depth of knowledge required	P1: Cannot be resolved without in-depth engineering knowledge at the level of one or more of K3, K4, K5, K6 or K8 which allows a fundamentals-based, first principles analytical approach
Range of conflicting requirements	P2: Involve wide-ranging or conflicting technical, engineering and other issues
Depth of analysis required	P3: Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models
Familiarity of issues	P4: Involve infrequently encountered issues
Extent of applicable codes	P5: Are outside problems encompassed by standards and codes of practice for professional engineering
Extent of stakeholder involvement and conflicting requirements	P6: Involve diverse groups of stakeholders with widely varying needs
Interdependence	P7: Are high-level problems including many component parts or sub-problems

Table 4.3: Range of Complex Engineering Activities

Attribute	**Complex activities** means (engineering) activities or projects that have some or all of the following characteristics:
Range of resources	A1: Involve the use of diverse resources (and for this purpose resources include people, money, equipment, materials, information and technologies)
Level of interaction	A2: Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues
Innovation	A3: Involve creative use of engineering principles and research-based knowledge in novel ways
Consequences for society and the environment	A4: Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation
Familiarity	A5: Can extend beyond previous experiences by applying principles-based approaches

Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. POs specified by the program must be significantly equivalent to the twelve graduate attributes or POs of BAETE.
ii. POs must contribute to each PEO.
iii. The process involved in defining and refining the POs must be described. The correlation between the course outcomes (COs) and POs must be demonstrated through the mapping of COs onto POs.
iv. The way in which each attribute of the Knowledge Profile (K1 – K8) is addressed in the curriculum must be demonstrated through mapping. The program must also demonstrate how the attributes of the Range of Complex Engineering Problems (P1 – P7) and Complex Engineering Activities (A1 – A5) are incorporated in the teaching, learning and assessment.
v. A course file must be maintained for each course. The course file should include the assessment of outcomes, curriculum, examination questions and answer scripts, other assessment tools and samples of corresponding student works, and a summary of performance and attainment of course outcomes with suggestions or feedback for future development.
vi. POs must be assessed using direct methods. Direct methods of assessment are accomplished through the direct examination or observation of students' knowledge or skills against measurable performance indicators or rubrics. In addition, indirect methods may also be used for PO assessment. Indirect methods of assessment are based on opinions or self-reports from different stakeholders. The way in which various assessment tools, including examinations and rubrics, contribute to the evaluation of attainment of each PO must be described. The results of the evaluation of PO attainment must be shown.
vii. It must be demonstrated through evidence from appropriate evaluation that the students attain all the POs by the time of the graduation.

4.9 Continuous Quality Improvement

The program must have a continuous quality improvement mechanism. Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. The program must demonstrate an established system for periodically compiling the level of attainment of PEOs, including a mechanism for tracking and obtaining feedback from graduates and their employers

ii. The findings of the CQI exercises for PEOs must be evaluated, and the identified shortcomings and limitations must be used to refine and improve the program
iii. POs must be assessed on a regular cycle. The program must prepare CQI file for each of the 12 POs to review considering feedback from relevant stakeholders including graduates
iv. Each course must have clear quality requirements and facilitate the achievement of COs through teaching-learning and assessment methods.
v. The concerned course instructor must prepare course review reports including CQI files for the courses he/she is teaching
vi. The program must evaluate the curriculum and teaching quality on a regular basis while considering feedback from faculty members and students. The program must demonstrate that the results of this periodic evaluation are used for continuous improvement

Interactions with the Industry 4.10

A communication channel between the educational institution and the industry should be in place. The industry should be encouraged to provide feedback concerning the quality of the teaching-learning process. Requirements and desirable attributes under this criterion are described in terms of the following sub-criteria.

i. The industry must participate in the development of the curriculum to ensure that it is relevant, regularly updated, and meets the needs of the industry, particularly in areas experiencing rapid changes
ii. The program should have an Industry Advisory Panel (IAP) and an Alumni Association (AA) for this purpose. The IAP or AA may meet at certain intervals with the department to provide feedback.
iii. The program must provide students with the opportunity to obtain industrial experience through internships, industry visits or design projects conducted by practicing engineers and faculty members with industrial experience.

CHAPTER

Review by Evaluation Team 5

Tasks for Evaluation Team 5.1

5.1.1 After members of the evaluation team have been appointed, the BAETE will notify the educational institution and the Sectoral Committee of the composition of the Evaluation Team. The Sectoral Committee will notify the evaluation team of whether any member of the committee will accompany the team during the on-site visit as a moderator. The BAETE will advise the educational institution to contact the Chairperson of the Evaluation Team through the BAETE Registrar to make arrangements for the on-site visit and to provide the name and contact number of a person for further information and clarification if necessary.

5.1.2 Members of the Evaluation Team should note that all correspondence between the educational institution and the BAETE, all reports made during the evaluation process and information regarding whether a program from an educational institution is being considered for accreditation are to be classified as confidential and should not be released to any unauthorized persons except with written permission from both the educational institution and the BAETE.

5.1.3 To maintain impartiality and transparency in the accreditation process, no member of the Evaluation Team should participate in any activity that might involve a conflict of interest.

5.1.4 The Evaluation Team members will conduct a comprehensive review of the documentation provided on the SAR. If additional information or clarifications of the information furnished by the educational institution are required, members will channel their requests through the Chairperson of the Evaluation Team, who will liaise with the contact person of the educational institution through the BAETE Registrar to obtain the information needed.

5.1.5 The Evaluation Team should meet before the on-site visit to discuss its preliminary findings from the documentation.

5.1.6 The on-site visit will usually be conducted over a period of three days for each program. A sample of on-site activities is provided in Annex II as a guide to the assessment to be conducted during the on-site visit.

5.1.7 An exit meeting should be conducted at the end of the on-site visit program, at which the Evaluation Team will present its preliminary findings orally to the educational institution. The findings for the purpose of reporting in the exit meeting, shall be classified into compliance or non-compliance, where non-compliance includes concern, weakness and deficiency.

5.1.8 In the event that an educational institution requires follow-up activities (for example, the educational institution may be required to present additional information that needs to be assessed), the evaluation team may appoint one of its members to conduct another visit to review the work.

5.1.9 The draft report of the evaluation team is expected to be prepared and forwarded to the respective Sectoral Committee within 3 weeks after the on-site visit. Annex III provides the report template to be used by the evaluation team.

5.2 Composition and Selection of Evaluation Team

The BAETE maintains a data bank of its trained program evaluators from which potential Evaluation Team members are selected. This data bank will be updated periodically. The program evaluators may be active or retired professionals.

Each Evaluation Team will consist of three members:
a) A Chairperson
b) Two Program Evaluators

The members of the Evaluation Team will be drawn from the following:
a) Academic institutions of repute
b) R&D laboratories and establishments
c) The government
d) Corporation/industry.

Industry Program Evaluators will be drawn from the domain areas relevant to the program. The Chairperson must not be below the rank of professor (or equivalent in the case of industry) and should have significant experience through previous participation as a program evaluator.

Normally, program evaluators from academia will be required to possess the following:

a) Significant teaching and research experience in the university and good standing in their respective disciplines
b) Demonstrable expertise in engineering education and/or a specific engineering discipline through publication and/or technology development

c) Good knowledge and skills for conduction program evaluations, obtained through training by BAETE or other accreditation bodies
d) A Ph.D. or equivalent as the highest academic degree

Normally, the program evaluators from industry will be required to possess the following:

a) Significant industrial experience, generally not less than 10 years of considerable engineering/managerial experience
b) Demonstrable expertise in the specific engineering discipline of the program to be evaluated for accreditation
c) Good knowledge and skills for conducting program evaluation, obtained through training by BAETE or other accreditation bodies
d) A rank equivalent to senior manager or higher, preferably with post-graduate qualifications

Selection and Training of Evaluators 5.3

To ensure program evaluation competence and to standardize the evaluation process, the BAETE provides regular training and orientation for program evaluators and team chairs through workshops and seminars. These trainings also help update the program evaluators regarding the BAETE's current policies.

The core knowledge and competencies required for program evaluators include the following:

a) Accreditation policy
b) Accreditation procedure
c) Requirements of general accreditation criteria and specific program criteria
d) Evaluation and judgment of compliance with benchmark standards of accreditation criteria
e) Outcome-based assessment
f) DOs and DON'Ts during on-site accreditation visits

CHAPTER

Program-Specific Criteria 6

Criteria for Aerospace Engineering or Similar Program 6.1

Aeronautical engineering programs must prepare graduates with knowledge of aerodynamics, aerospace materials, structures, propulsion, flight mechanics, and stability and control. Astronautical engineering programs must prepare graduates with knowledge of orbital mechanics, space environment, attitude determination and control, telecommunications, space structures, and rocket propulsion. Aerospace engineering programs or other engineering programs combining aeronautical engineering and astronautical engineering must prepare graduates with knowledge covering one of the areas (i.e., aeronautical engineering or astronautical engineering) described above and knowledge of some topics from the other area. Programs must also prepare graduates to have design competence that includes the integration of aeronautical or astronautical topics.

Criteria for Biomedical Engineering or Similar Program 6.2

The structure of the curriculum must provide both breadth and depth across the range of engineering and science topics consistent with the program's educational objectives and student outcomes. The curriculum must prepare graduates with experience in the following:

a. Applying the principles of engineering, biology, human physiology, chemistry, calculus-based physics, mathematics (through differential equations) and statistics
b. Solving bio/biomedical engineering problems, including those associated with the interaction between living and non-living systems
c. Analyzing, modeling, designing, and realizing bio/biomedical engineering devices, systems, components, or processes
d. Measuring and interpreting data from living systems

Criteria for Chemical Engineering or Similar Program 6.3

The curriculum shall provide a thorough grounding in the basic sciences that include chemistry, physics and mathematics as appropriate to the objectives of the program. Due emphasis shall also be given to social sciences and communications. The

curriculum must include topics such as engineering thermodynamics, fluid mechanics, heat and mass transfer, process control and design. The Process Design Project shall be a requirement for completion of the degree.

6.4 Criteria for Civil Engineering, Civil and Environmental Engineering or Similar Program

The curriculum must prepare graduates to apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science; apply probability and statistics to address uncertainty; analyze and solve problems in at least four technical areas appropriate to civil engineering; conduct experiments in at least two technical areas of civil engineering and analyze and interpret the resulting data; design a system, component, or process in at least two civil engineering contexts; include principles of sustainability in design; explain basic concepts in project management, business, public policy, and leadership; analyze issues in professional ethics; and explain the importance of professional licensure.

6.5 Criteria for Computer Science and Engineering or Similar Program

The structure of the curriculum must provide both breadth and depth across the range of engineering and science topics consistent with the program's educational objectives and student outcomes. The curriculum must include the following: probability and statistics, differential and integral calculus, discrete mathematics, basic sciences, computer science, and engineering sciences for the analysis and design of complex electrical and electronic devices, software, and systems containing hardware and software components; concepts of programming languages, data structures, algorithms and complexity, software design, digital logic, computer organization and architecture, operating systems and networking systems must be addressed; the integration of theory, practice, and tools for the specification, design, implementation, testing and maintenance of software systems; exposure to a variety of programming languages and systems, including proficiency in at least one higher-level language; and advanced coursework that builds on the fundamental coursework to provide depth.

Criteria for Electrical Engineering, Electrical and Electronic Engineering, Electronic and Telecommunication Engineering or Similar Program 6.6

The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program. The curriculum must include probability and statistics, including applications appropriate to the program's name; mathematics through differential and integral calculus; sciences (defined as biological, chemical, or physical science); and engineering topics (including computing science) necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components. The curriculum for programs containing the modifier "electrical," "electronic(s)," "communication(s)," or "telecommunication(s)" in the title must include advanced mathematics such as differential equations, linear algebra and complex variables. The curriculum for programs containing the modifier "communication(s)" or "telecommunication(s)" in the title must include topics in communication theory and systems. The curriculum for programs containing the modifier "telecommunication(s)" must include the design and operation of telecommunication networks for services such as voice, data, image, and video transport.

Criteria for Environmental Engineering or Similar Program 6.7

The curriculum must prepare graduates to apply knowledge of mathematics through differential equations, probability and statistics, calculus-based physics, chemistry (including stoichiometry, equilibrium, and kinetics), an earth science, a biological science, and fluid mechanics. The curriculum must prepare graduates to formulate material and energy balances and analyze the fate and transport of substances in and between air, water, and soil phases; conduct lab experiments and analyze and interpret the resulting data in more than one major environmental engineering focus area (e.g., air, water, land, environmental health); design environmental engineering systems that include considerations of risk, uncertainty, sustainability, life-cycle principles, and environmental impacts; and apply advanced principles and practices relevant to the program objectives. The curriculum must prepare graduates to understand concepts of professional practice, project management, and the roles and responsibilities of public institutions and private organizations pertaining to environmental policy and regulations.

6.8 Criteria for Industrial and Production Engineering or Similar Program

The curriculum must prepare graduates to design, develop, implement, and improve integrated systems that include people, materials, information, equipment and energy. The curriculum must include in-depth instruction that promotes the integration of systems using appropriate analytical, computational, and experimental practices.

The program must prepare graduates to have proficiency in (a) materials and manufacturing processes: the ability to design manufacturing processes that result in products that meet specific material and other requirements; (b) process, assembly and product engineering: the ability to design products and the equipment, tooling, and environment necessary for their manufacture; (c) manufacturing competitiveness: the ability to create competitive advantage through manufacturing planning, strategy, quality, and control; (d) manufacturing systems design: the ability to analyze, synthesize, and control manufacturing operations using statistical methods; and (e) manufacturing lab or facility experience: the ability to measure manufacturing process variables and develop technical inferences about the process.

6.9 Criteria for Metallurgical and Materials Engineering or Similar Program

The curriculum must prepare graduates to apply advanced science (such as chemistry, biology and physics), computational techniques and engineering principles to the materials systems implied by the program modifier (e.g., ceramics, metals, polymers, biomaterials, composite materials); to integrate the understanding of the scientific and engineering principles underlying the four major elements of the field: structure, properties, processing, and performance related to the appropriate material systems; to apply and integrate knowledge from each of the above four elements of the field using experimental, computational and statistical methods to solve materials problems, including selection and design, consistent with the program's educational objectives.

6.10 Criteria for Mechanical Engineering or Similar Program

The curriculum must require students to apply principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations) and to model, analyze, design, and realize physical systems, components or processes; additionally, it must prepare students to work professionally in either thermal or mechanical systems while requiring coursework in both areas.

Criteria for Naval Architecture and Marine Engineering or Similar Program 6.11

The program must prepare graduates to apply probability and statistical methods to naval architecture and marine engineering problems; to have basic knowledge of fluid mechanics, dynamics, structural mechanics, materials properties, hydrostatics, and energy/propulsion systems in the context of marine vehicles; and to have familiarity with instrumentation appropriate to naval architecture and/or marine engineering.

CHAPTER

Self-Assessment Report Format 7

Introduction 7.1

This section provides a generic form for the Self-Assessment Report (SAR) that an institution must submit to begin the accreditation process. The SAR should reflect the quantitative and qualitative assessment of the strengths and limitations of the program being submitted for accreditation.

Guidelines for preparing the SAR 7.2

The completed SAR should describe how the institution and the program comply with the regulations and requirements as stipulated in the relevant act/statute and with the benchmark of the BAETE in each of the criteria.

The following points should be noted while preparing the SAR.

1. The data and the information provided in the SAR should be adequate and should be supplemented by comments and discussions that will allow the evaluation team to perform a preliminary evaluation of the program based on the SAR.
2. For any criteria and sub-criteria, the SAR should generally address the following three questions. Data, examples of cases and other supporting information should be included in the SAR to justify the assertions. The challenges faced and the way in which these were overcome during enactment, implementation and improvement of each policy and process should also be described.
    a. Is there a policy/process in place?
    b. If 'yes', is the policy/process in practice?
    c. Does any improvement mechanism exist for the policy/process?
3. The SAR should proactively and unambiguously identify the deviation from the act/statute where and when one exists.

Supplemental Documents 7.3

The following documents must be provided in the Annexure.

1. Latest copy of the prospectus and a copy of the institution's latest academic calendar.
2. Copy of the letter of approval to establish the institution from the appropriate authority.
3. Copy of the letter of approval to establish the program from the appropriate authority.
4. Copy of statutes/academic ordinances.

All other documents requested in the SAR template shall have to be provided as Annexure(s). The SAR and the Annexure should be printed on both sides of A4 size paper arranged in two volumes. The SAR should not exceed 200 pages. A soft copy should be given with each volume contained in one file.

7.4 Template

The template for the Self-Assessment Report (SAR) begins on the next page.

This section provides a generic form for the SAR that an institution must submit to begin the accreditation process. All supporting documents shall have to be appended at the end of the SAR as Annexes. All the pages of the submitted SAR including the annexes shall have to be consecutively numbered.

Board of Accreditation for Engineering and Technical Education (BAETE)

Self-Assessment Report (SAR) for Accreditation

of the

Program Name

Institute Name

Location

Month, Year

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GENERAL INFORMATION

1. Program title _____
   Abbreviation _____
2. Department name _____
   Institution name _____
3. Ownership status□ Public□ Private □ Other
4. Full postal address of institution_____
   _____
5 Tel. No. _____
6. Fax No. _____
7. E-mail _____
8. Website/URL _____
9. University affiliation (if applicable) _____
   _____
10. Year the university was established _____
11. Year the program began _____
12. Information about last accreditation
    Applying for the first time? □ Yes □ No
    Was granted accreditation for .....years in 20.....
    Applied in 20..... but was not accredited/deferred

CONTACT INFORMATION

Name _____
Mailing Address _____
Telephone _____
Fax _____
Email _____

ELIGIBILITY FOR ACCREDITATION

Answer the following questions:

1. Is the institution approved by an appropriate authority?
Yes _____ No _____
If yes, state the name of the approving authority and attach a copy of the approval letter.

2. Is the program seeking accreditation approved by an appropriate authority?
Yes _____ No _____
If yes, state the name of the approving authority and attach a copy of the approval letter.

3. Is the stipulated duration of the program for a full-time student four years?
Yes _____ No _____

4. Does admission to the program require a minimum of twelve years of schooling?
Yes _____ No _____

5. Does the program follow an outcome-based education approach?
Yes _____ No _____

6. Is a minimum of 130 credit hours (as per clause 2.1 of the BAETE accreditation manual) required to graduate from the program?
Yes _____ No _____

7. Do statutory bodies (e.g., Syndicate, Academic Council, Finance Committee, Disciplinary Committee, Faculty Recruitment Committee) exist, and are they functional?
Yes _____ No _____

8. Does the department offering the program have an adequate number of full-time faculty members, including senior faculty members, with relevant academic specializations?
Yes _____ No _____

9. Does the institution have adequate lab facilities for the program?
Yes _____ No _____

A program will be considered for accreditation only if the answers to all nine questions above are positive. The application will not be accepted if the answer to any of the nine questions is negative.

Proceed with the application only if there is no negative response to any of the above nine questions.

FOR RENEWAL OF ACCREDITATION ONLY

Addressing deficiencies, weaknesses and concerns identified during the most recent accreditation evaluation(s) (not applicable for new accreditation applications)

List the (i) deficiencies, (ii) weaknesses and (iii) concerns identified during the most recent accreditation assessment(s). Mention the remedial actions taken and the improvements made for each item and provide copies of documents that support the assertions.

	Statement	Remedial actions taken	Improvements made
Deficiencies			
Weaknesses			
Concerns			

Please attach a copy of the most recent accreditation certificate and the final statement received from the BAETE in the Appendix.

Criterion I: Organization and Governance

1.1 Background Information

Describe in no more than 300 words the historical background of the institution and the program under evaluation.

1.2 Compliance with relevant acts and statutes

Provide answers to the following:

Issue	Approving authority
The institution is approved by	
The program is approved by	
The curriculum of the program is approved by	

*Copy of each approval document must be provided in the Annexure.

1.3 Organizational structure

Provide the up-to-date organogram of the institution.

1.4 Statutory positions and bodies of the institution

1.4.1 Appointment of Vice Chancellor, Pro-Vice Chancellor and Treasurer

State the process for appointing the following office bearers:

Appointment of	Appointing/ approving authority	Date and period of appointment	Reference to clause/section/article of Act/ Statute/Rule*
Vice Chancellor			
Pro-Vice Chancellor			
Treasurer			

*Refer to any other published documents other than acts/statutes/rules if necessary.

1.4.2 Formation and function of the statutory bodies

For each syndicate, the academic council, the finance committee, the faculty selection committee, the disciplinary committee and any other statutory committee, state the assigned responsibility (as per act/ordinance/statutes) of the committee. Prepare a table as follows for each committee.

Name and affiliation of member	Membership capacity	From – to

Comment briefly on the alignment of the actual activities of each committee with the assigned responsibilities.

List the dates of the meeting(s) of each of the statutory bodies during the last calendar year. Attach a copy of the most recent meeting notice of each committee in the Annexure.

1.4.3 Formation and function of the management committees

Institutions often form committees in addition to statutory bodies for the smoother running of academic and administrative activities. For each such committee, state the assigned responsibility of the committee. Prepare a table as follows for each committee.

Name and affiliation of member	Membership capacity	From – to

Comment briefly on the alignment of the actual activities of each committee with the assigned responsibilities.

List the dates of the meeting(s) of each management committee during the last calendar year. Attach a copy of the most recent meeting notice of each committee in the Annexure.

1.5 Existence of and adherence to policies

1.5.1 Documented policies

Provide copies of the statutes, the ordinances and any other relevant policies such as service rules, academic rules, codes of conduct, disciplinary rules, recruitment and promotion policies, salary structure, leave rules, and scholarship and financial aid policies for students and employees. Describe how each of these policies is disseminated to the stakeholders.

1.5.2 Adherence to policies

Describe briefly the extent to which the policies are adhered to when making academic and administrative decisions. Additionally, list the frequency of exception requests and the cases in which exceptions are made. The process for making exceptions, if any exists, should be outlined.

Discuss how the effectiveness of the policies is evaluated and the processes that are followed to update a policy. Give relevant examples, where applicable, to justify assertions.

1.6 Grievance redress system

Present documents that pertain to the existence of a grievance redress mechanism, if any, for students and employees. Briefly discuss to what extent the system has been used in reality. Give examples to justify the assertions.

1.7 Convocation

List the dates of convocations and the number of students who have received a degree over the last three calendar years.

Date of convocation (dd/mm/yyyy)	Total no. of students who have received the degree	No. of students in the program under evaluation who have received a degree

Criterion 2: Financial and Physical Resources

2.1 Finance and budget

2.1.1 Assets commensurate with revenue

Please complete the following table for the last three calendar years.

Information	Year 1	Year 2	Year 3
Total income (BDT)			
Total capital investment (BDT)			
Total operational expenditure (BDT)			
Total asset (BDT)			

2.1.2 Adequacy of budget

State the amount budgeted and the actual expenditure in BDT and percentage of the total amount for the following sectors for each of the last three calendar years. In case of shared budgetary allocation and expenditure, please indicate the following.

- Salary of the faculty members of the institution and of the program under evaluation
- Salary of the non-teaching staff of the institution and of the program under evaluation
- Laboratories of the institution and the program under evaluation
- Physical infrastructure (space, furniture, air conditioners)
- IT
- Maintenance
- Medical center
- Co-curricular and extra-curricular activities
- Library

Briefly discuss whether the budgeted amounts are adequate for the proper running of the program under evaluation. If they are not, indicate the sectors where inadequacy exists. Identify what measures are being taken to address the inadequacies.

2.1.3 Appropriateness of budgetary allocation

Describe the budgetary planning process, the identification of priority areas and resource allocation. Additionally, describe the general process of preparing and approving the budget, including feedback from the stakeholders.

2.2 Scholarships and financial aid for students

State the total amount in BDT given to students of the institution as well as the students of the program under consideration such as scholarships and financial aid during each of the last three academic years. Express the amount as a percentage of the institution's total income.

2.3 Accommodations for male and female students

State whether the institution provides accommodations for students. If so, give the total number of students using institutional accommodation and provide a gender breakdown for each semester during the last three calendar years.

2.4 Safety measures: infrastructure, practices, training and compliance

Provide details for the following including compliance with regulatory requirements where applicable.

- Firefighting policy, facility and rehearsal
- Emergency evacuation and assembly plan and rehearsal
- Campus safety and security measures in place
- Disabled access and mobility

2.5 Safety and health measures in the laboratories

Describe the safety rules, procedures and practices that are in place in each of the laboratories used by the program. Describe what provisions exist in each laboratory in case of accidents and health hazard conditions.

2.6 Sports and recreational facilities

Provide details of the institution's outdoor games and sports facilities.
Provide details of the institution's indoor games and recreational facilities.
Provide details of student clubs and their activities.

2.7 Placement center

State the designated activities and functions of the placement center if such a center exists. Additionally, provide the organogram of the center and state the name and designation of each staff member along with his or her qualifications.

Criterion 3: Faculty

3.1 Number of full-time faculty members

Provide a list of full-time faculty members teaching in the program for each semester of the last three academic years, as per the following table. State whether the program has a sufficient number of qualified faculty members with relevant areas of specialization to teach all the courses offered for the program.

Name	Designation	Area of specialization	Highest academic degree	Years of experiences		Date of joining this institution	Total weekly teaching load (in hours)
				Teaching	Industrial (if any)		

Additionally, provide detailed curriculum vitae for each faculty member, including a complete list of publications, in the Annexure. The format of the faculty curriculum vitae is given in Appendix-A of this template.

3.2 Number of part-time faculty members

Provide a list of part-time faculty members teaching in the program for each semester during the last three academic years, as per the following table.

Name	Designation	Area of specialization	Highest academic degree	Years of experiences		Date of joining this institution	Total weekly teaching load (in hours)
				Teaching	Industrial (if any)		

Additionally, provide detailed curriculum vitae in the Annexure for each faculty member, including a list of publications. The format of the faculty curriculum vitae is given in Appendix-A of this template.

3.3 Class size

State the minimum class size, the maximum class size and the average class size of all the courses/sections offered by the program for each of the semesters during the last three academic years. State whether the class size is suitable for conducting teaching-learning and

assessment activities to achieve all the course outcomes. In the Annexure, provide a list of all the courses offered by the program, including the class size and the name of the instructor, for each semester during the last three academic years.

3.4 Student-teacher ratio

Calculate the student-teacher ratio of the program for each semester during the last three academic years. Describe in detail the calculation procedure and justify the appropriateness of the adopted calculation model. State whether the student-teacher ratio is suitable for conducting the teaching-learning and assessment activities to achieve all the course outcomes and for adequate interactions between teachers and students outside of class.

3.5 Involvement of faculty members in research, development and professional activities

Complete the following table for full-time faculty members in the current semester.

Name	Designation	No. of journal/conference papers published in the last three years	No. of consulting positions during the last three years	List of professional society activities in the last one year

3.6 Role of faculty members in coordinating and improving the courses

Describe in detail the role of the faculty members in establishing course outcomes, selecting appropriate pedagogical and assessment tools, updating course content, and making decisions regarding quality improvements to the program.

Attach copies of the minutes of relevant meetings held during the last three academic years in the Appendix in support of this assertion.

3.7 Training of faculty members on outcome-based education

List all the training events organized for department faculty members during the last three calendar years in establishing appropriate course outcomes, conducting effective teaching-learning activities, conducting suitable assessments, and measuring outcome achievement as per the following table.

Date	Title of the training event	Number of attendees from the relevant department	Remarks

Provide a copy of the notice for each event and the list of attendees in the Annexure.

Criterion 4: Students

4.1 Existence of and adherence to a well-formulated admission policy, including admission criteria

Describe in detail the admission policy and process to admit new students into the program (attach published brochures/guidelines, website address). Discuss if any exceptions are made to the admission policy in admitting students.

State any preferences/priorities in admissions/quotas. Provide the number of students admitted into the program for each semester/term of the last three academic years in tabular form.

Academic year	Calendar span (from-to)	Semester/ Term I	Semester/Term II (if applicable)	Semester/Term III (if applicable)
Most recent				
Most recent minus 1				
Most recent minus 2				

4.2 Policy for transfer students

Describe the policy and process for accepting the transfer students into the program and provide details (attach published brochures/guidelines, website address). Mention the process of determining the equivalence of transfer credits.

Provide information on the transfer of students as per the following table for the last three academic years.

Name and ID of the student	Year and Semester /Term of transfer	Number of transferred credits	Name and location of the institution and name of the program from where transferred credits were earned

4.3 Continuous monitoring and feedback of student's academic performance

Describe the process of monitoring and providing continuous feedback to students regarding their academic performance and outcome achievement. Describe measures that are in place to help academically weaker students.

4.4 Advising and counseling

Describe the process of providing academic advising to the students. If each student is assigned a faculty member as a designated advisor, provide advisor information for the three most recent semesters/terms, as per the following table.

Name of the faculty member	Designation	No. of advisees assigned

Discuss the nature of the advising activities with examples. State whether the advisors maintain advising files or any other records of advising.

Describe in detail whether the department/institution provides professional counseling support to students in need.

4.5 Extra- and co-curricular activities

State the policy of the institution/department, if any exists, regarding students' extra- and co-curricular activities. State how these activities are encouraged/supported institutionally. List students in the program who have participated in student activities at the institutional level or higher in the past three academic years. Additionally, list notable achievements involving students from the program, if any.

Criterion 5: Academic Facilities and Technical Support

5.I Library

5.I.I Space and hours of operation

State the total space allocated for the library and the number of students served by the library. State the library's operating hours.

5.I.2 Library resources (books, technical journals, proceedings)

Provide information on books, journals, proceedings and other resources in the following table

Category	No. of titles	No. of copies (if applicable)
Books (hard copy)		
Books (electronic)		NA
Journals (hard copy)		
Journals (electronic)		NA
Proceedings (hard copy)		
Proceedings (electronic)		NA
Others		

5.1.3 Modernization of the library

Describe how IT and other modern technologies have influenced the use, operation and record-keeping of the library for both users and library officials.

5.2 Classrooms

Provide a statement on the number, usage and facilities of classrooms available to the program. Justify whether these resources are adequate for the program.

5.3 Laboratories and equipment

5.3.1 Laboratories for all relevant courses of the curriculum

List all the laboratory courses and the corresponding name and location of the laboratory where the classes are conducted. Prepare a table for each semester of the last academic year.

Serial number	Course no. and name	Laboratory name	Location of the lab (campus/building/floor/room #)

5.3.2 Availability of equipment

For each laboratory, prepare a table of as per the following table.

Name of the laboratory:

Serial number	Name of the equipment	Quantity	Date and cost of purchase	Present condition

5.4 Full-time technical support staff for laboratories (technician/instructor and assistant)

For each laboratory, list the full-time technical personnel as per the following table.

Name of laboratory	Name of person	Designation	Qualification (education, training)	Experience (years)

5.5 Improvements of laboratory facilities

Describe the improvements that have been made in the laboratories for the program during the last three academic years. Describe the plans currently under consideration for laboratory improvement.

5.6 Internet and computing facilities

List the Internet facilities available for students and faculty members. Required information includes total bandwidth, number of computers with Internet connections, daily hours that the services are available and areas covered by Wi-Fi.

List the number of laboratories, including the number of computers that are accessible to students outside of class/lab times. Identify the types of uses that are available to students. Computers in the library or in any other common place may be considered if such facilities are available.

Criterion 6: Curriculum and Teaching-Learning Processes

6.1 Curriculum

6.1.1 Minimum credit hours

State the minimum number of credit hours required to earn the degree under the program. Express the number in contact hours, explaining the calculation method used. Convert the program's credit hours as per the conversion rules stated in Section 2.1 of the BAETE accreditation manual.

6.1.2 Course content

Complete the following table that describes the category of each course, e.g., mathematics, basic science, language, humanities and social sciences, non-engineering skills, engineering, design project, others. Note that humanities and social sciences courses are non-skill courses. Non-engineering skill courses, such as accounting, should not be categorized as humanities courses. Additionally, indicate for each course whether it is a program requirement or an elective.

Course no.	Course title	Credit hours	Contact hours per semester /term	Category	Required/elective

Also submit the detailed content of each course offered by the program, including credit hours, contact hours, prerequisites and a list of the textbooks and reference books in the Annexure. The format of the detailed course content is given in Appendix-B of this template.

6.1.3 Program-specific criteria

Provide a breakdown of the structure of the curriculum detailing the credits assigned in each category(as mentioned in Section 6.1.2). Describe how the curriculum meets the requirements of the relevant program-specific criteria.

6.1.4 Flow chart

Submit a semester-by-semester flow chart or worksheet that depicts the prerequisite structure of the required courses of the program in the Appendix.

6.1.5 List of offered courses

Submit the program's course offering list for each semester of the last three academic years in the Annexure.

6.1.6 Course files

The department should maintain a course file for each course offered by the department for the program in each semester of the last three academic years. If a lab is integrated with theory in any course, separate course files should be prepared for the theory and the lab parts of the course.

The course files shall be made available during the on-site visit for perusal by the members of the evaluation team. The course file must contain at least the following items.

- Lecture plan detailing prerequisites, course outcomes and content, text and reference books, assessment tools for each course outcome, and grading policy
- Questions and three representative examples of answer scripts (one excellent, one average, one marginal pass) for each exam, class test and quiz (for theory courses)
- Lab sheet and three representative examples of lab reports (for lab courses)
- Assessment criteria or rubrics for assignments/projects/lab activities. Three representative examples for each assignment/project/lab activity report
- Final tabulation sheet including grade assigned to each student
- Assessment of outcome achievement for each course outcome

6.2 Laboratory activities

State how the program gives importance to hands-on lab activities incorporating higher order learning as per a learning taxonomy.

Provide the list of experiments, including open-ended experiments, conducted in each lab course. Additionally, list the projects/assignments given in each lab course. Provide information for each semester of the last three academic years.

6.3 Final-year design project

Describe the process followed in conducting the final-year design projects. Describe how the experience in the final-year design project is based on the knowledge and skills acquired in earlier coursework and incorporates appropriate engineering standards and multiple design constraints.

Provide a list of the titles of final-year design projects completed in each semester of the last three academic years, as per the following table.

Design project title	Name(s) of the supervisor(s)	Names of the group members

The original final reports should be made available during the on-site visit for perusal by the members of the evaluation team.

In case the program demonstrates culmination of POs through any method other than the Final-year design project, describe the method in detail highlighting how the method used is based on the knowledge and skills acquired in earlier coursework and how it incorporates appropriate engineering standards and multiple design constraints.

6.4 Teaching-learning and assessment activities

Describe the process used to select appropriate teaching-learning activities in different courses. Highlight the interactive/non-traditional activities adopted in different courses, noting the course and the activity.

Describe the process used to select appropriate assessment tools in different courses. Highlight the tools that are used for assessing skills and attitudes.

6.5 Academic calendar

Provide the published academic calendar for each semester of the last three academic years. State whether the semester actually progressed according to the calendar. If not, indicate the deviations in each semester.

Criterion 7: Program Educational Objectives (PEOs)

7.1 Mission and Vision

- State the institution's vision and mission
- State the vision and mission of the department/faculty/school offering the program

7.2 Program Educational Objectives (PEOs): Statements and their mapping with the institutional/departmental mission

State the Program Educational Objectives (PEOs) and show their alignment with the institutional/departmental mission, as per the following table.

PEO No.	PEO statement	Institutional/departmental mission statements				
		Mission statement 1	Mission statement 2	…	…	Mission statement n
1						
2						
.						
.						

7.3 Process for PEO establishment measurement and review

7.3.1 PEO establishment

Describe the process of establishing the PEOs. Provide evidence and documents.

7.3.2 PEO measurement and review

Describe the process of measuring the attainment of each PEO including rubrics. Provide evidence and documents. Describe the process of periodic review of each PEO. Provide evidence and documents.

Criterion 8: Program Outcomes (POs) and Assessment

8.1 Program outcome (PO) statements and their mapping with the PEOs

State the program outcomes (POs) and show their alignment with PEOs as per the following table.

PO No.	PO statement	PEO 1	PEO 2	…	…	…
a						
b						
c						
d						
.						
.						

Indicate the correlation using either binary levels (yes/no) or ternary levels (high/low/none). Leave the cell blank if there is no correlation (no/none).

8.2 Course outcomes (COs)

8.2.I Statements of COs

State the COs for each core course offered by the program, which are used to demonstrate attainment of POs, as per the following table.

CO No.	CO statement	Corresponding PO No.	Domain/level of learning taxonomy	Delivery methods and activities	Assessment tools

The COs of all other courses offered by the program, listed by department, along with the corresponding domain/level of learning taxonomy, delivery methods and activities and assessment tools, should be provided in the Annexure.

8.2.2 Relationship between COs and POs

For each course included in the table of Section 8.2.1, present a map of COs and POs, as per the following table. Alternatively, the following information may be presented graphically.

Course No. and title	CO No.	PO-a	PO-b	…	…	…	…

Indicate the correlation using either binary levels (yes/no) or ternary levels (high/low/none). Leave the cell blank if there is no correlation (no/none).

8.3 Knowledge Profile, Complex Engineering Problems and Complex Engineering Activities

Demonstrate, through mapping, how each attribute of the Knowledge Profile (K1 – K8) is addressed in the curriculum. Additionally, demonstrate how each attribute of the Range of Complex Engineering Problems (P1 – P7) and Complex Engineering Activities (A1 – A5) is incorporated in the teaching, learning and assessment.

8.4 Assessment of COs

Describe how the attainment of COs is assessed in each course, including the rubrics, where applicable. The assessment processes, attainment criteria and scale, and expected level of attainment should be clearly stated. Present a summarized assessment of the COs of the

courses listed in the table of Section 8.2.2. Evidence of CO assessments for the other courses offered by the department for the program in each semester of the last calendar year should be included in the Annexure.

8.5 Attainment of POs required by the BAETE

8.5.I Attainment of PO(a):

Describe how the attainment of PO(a) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. State how Knowledge Profile attributes (K1 – K4) are incorporated in PO(a). Identify which of the attributes of the Range of Complex Engineering Problems (P1 – P7) are addressed through the attainment of PO(a) and provide evidence to support the assertion. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(a) is being attained.

8.5.2 Attainment of PO(b):

Describe how the attainment of PO(b) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. State how Knowledge Profile attributes (K1 – K4) are incorporated in PO(b). Identify which of the attributes of the Range of Complex Engineering Problems (P1 – P7) are addressed through the attainment of PO(b) and provide evidence to support the assertion. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(b) is being attained.

8.5.3 Attainment of PO(c):

Describe how the attainment of PO(c) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. State how Knowledge Profile attribute K5 is incorporated in PO(c). Identify which of the attributes of the Range of Complex Engineering Problems (P1 – P7) are addressed through the attainment of PO(c) and provide evidence to support the assertion. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(c) is being attained.

8.5.4 Attainment of PO(d):

Describe how the attainment of PO(d) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. State how Knowledge Profile attribute K8 is incorporated in PO(d).

Identify which of the attributes of the Range of Complex Engineering Problems (P1 – P7) are addressed through the attainment of PO(d) and provide evidence to support the assertion. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(d) is being attained.

8.5.5 Attainment of PO(e):

Describe how the attainment of PO(e) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. State how Knowledge Profile attribute K6 is incorporated in PO(e). Identify which of the attributes of the Range of Complex Engineering Problems (P1 – P7) are addressed through the attainment of PO(e) and provide evidence to support the assertion. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(e) is being attained.

8.5.6 Attainment of PO(f):

Describe how the attainment of PO(f) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. State how Knowledge Profile attribute K7 is incorporated in PO(f). Identify which of the attributes of the Range of Complex Engineering Problems (P1 – P7) are addressed through the attainment of PO(f) and provide evidence to support the assertion. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(f) is being attained.

8.5.7 Attainment of PO(g):

Describe how the attainment of PO(g) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. State how Knowledge Profile attribute K7 is incorporated in PO(g). Identify which of the attributes of the Range of Complex Engineering Problems (P1 – P7) are addressed through the attainment of PO(g) and provide evidence to support the assertion.Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(g) is being attained.

8.5.8 Attainment of PO(h):

Describe how the attainment of PO(h) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. State how Knowledge Profile attribute K7 is incorporated in PO(h.) Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(h) is being attained.

8.5.9 Attainment of PO(i):

Describe how the attainment of PO(i) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. Identify the expected level of attainment. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(i) is being attained.

8.5.10 Attainment of PO(j):

Describe how the attainment of PO(j) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment.

Identify which of the attributes of the Range of Complex Engineering Activities (A1 – A5) are addressed through the attainment of PO(j) and provide evidence to support the assertion. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(j) is being attained.

8.5.11 Attainment of PO(k):

Describe how the attainment of PO(k) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(k) is being attained.

8.5.12 Attainment of PO(l):

Describe how the attainment of PO(l) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which PO(l) is being attained.

8.6 Achievement of additional POs

Describe how the attainment of each additional PO (if any) is assessed and evaluated. State and justify the methods, tools, criteria and scale used in the assessment process. State the expected level of attainment for each of the additional POs. Present a summary of the results obtained after the assessment and analysis to demonstrate the extent to which each additional PO is being attained.

Criterion 9: Continuous Quality Improvement (CQI)

9.1 Feedback from students

9.1.1 Student evaluation of courses

State whether students evaluate every course/instructor at the end of the semester. If yes, provide a sample student evaluation form in the Annexure.

9.1.2 Student survey

State whether the department/institution conducts a periodic survey of the students to assess the level of outcome achievements. If yes, provide the survey form in the Annexure.

9.2 Feedback from course instructors

State whether course instructors evaluate every course offered by department for the program at the end of the semester. If yes, provide a sample instructor evaluation form in the Annexure.

9.3 Feedback from external stakeholders

9.3.I Feedback from alumni

State how the department collects feedback from alumni regarding PEO and PO achievements. Provide supporting documents (survey results, meeting minutes).

9.3.2 Feedback from employers

State how the department collects feedback from employers regarding PEO and PO achievements. Provide supporting documents (survey results, meeting minutes).

9.4 CQI loops

9.4.I CQI Loop for PEO

Describe the CQI processes for PEOs. In particular, discuss how the results of the evaluation and feedback from various stakeholders are systematically utilized to continuously improve the PEOs.

The feedback loop should be shown either pictorially as in a flow diagram or in tabular form. State any significant, justifiable future improvement plan that has been devised based on the present evaluation results.

Provide copies of documents (survey results, analysis reports, meeting minutes) to justify each statement.

9.4.2 CQI Loop for PO

Describe the CQI processes for POs. In particular, discuss how the results of direct and indirect assessments including feedback from various stakeholders are systematically utilized to continuously improve the PO attainments.

The loop should be shown either pictorially as in a flow diagram or in tabular form. State any significant, justifiable future improvement plan that has been devised based on the present evaluation results.

Provide copies of documents (survey results, assessment and analysis reports, meeting minutes, etc.) to justify each statement.

9.4.3 CQI Loop for CO and Curriculum

Describe the CQI processes for COs in courses and curriculum. In particular, discuss how the results of assessment and feedback from various stakeholders are systematically utilized to continuously improve the COs, their attainments and the curriculum.

The CQI loop should be shown either pictorially as in a flow diagram or in tabular form. State any significant, justifiable future improvement plan that has been devised based on the present evaluation results.

Provide copies of documents (survey results, assessment and analysis reports, meeting minutes) to justify each statement.

Criterion 10: Interactions with the industry

10.1 Industrial advisory panel

List the names, designations and professional qualifications of the members of the program/department's industrial advisory panel. Submit copies of notices for the industrial advisory panel meetings and the attendee lists of meetings held over the last three academic years. The minutes of these meetings should be made available to members of the Evaluation Team during the on-site visit.

10.2 Alumni association

If an alumni association exists, provide information about its formation, membership and operating process. Additionally, provide the appropriate link to the alumni association on the web.

10.3 Participation of the industry in academic updates

Explain how industrial participation is ensured in the establishment, update and improvement of the objectives, outcomes and curriculum to ensure that these aspects remain relevant to the industry. This description should be correlated to the discussion in Section 7.3 of the SAR template.

Provide copies of documents in support of the given explanation.

10.4 Students' opportunities to gain industrial experience

10.4.1 Internships

State whether the students in the program are required to perform an industrial internship. If yes, describe the nature and the duration of the internship. Explain how student performance and outcome achievements during the internship are assessed.

Provide copies of documents that support the given explanation.

10.4.2 Final-year design project

State whether the final-year design projects are conducted with industry collaboration. If yes, provide details regarding the industry's involvement in selecting the project topic, supervising project activities and providing assessment.

Provide copies of documents that support the given explanation.

In case the program demonstrates culmination of POs through any method other than the Final-year design project, describe how the selected method incorporates industry collaboration providing details. Provide copies of documents that support the given explanation.

10.4.3 Industry visits

State whether the students in the program are required to visit companies within the industry. If yes, provide details regarding the nature of such visits. Explain how student learning and outcome achievement as a result of such visits are assessed.

Provide copies of documents that support the given explanation.

Annexure A: Faculty Curriculum Vitae

The curriculum vitae of the faculty members should be included in the Annexure as directed in sections 3.1 and 3.2 of the SAR template.

Please use the following format for preparing the curriculum vitae (maximum 2 pages) for each of the faculty members under the program.

1. Name
2. Designation
3. Educational qualification (start from highest) – degree, discipline, institution, year
4. Academic experience (most recent first) – institution, designation, period (mm/yyyy- mm/yyyy), type (full-time or part-time)
5. Non-academic experience (research, industrial) – organization, title/position, period (mm/yyyy- mm/yyyy), type (full-time or part-time)
6. Fellowship/membership of academic bodies and professional organizations
7. Honors and awards
8. List of significant publications and presentations in the five most recent years – title, names of the author(s), name of the journal/conference where published/presented, month and year of publication or presentation
9. List of Professional Consultancy and Sponsored Research activities in the five most recent years – organization, title of the consultancy/research project, amount received if any, year

Annexure B: Course Content

The detailed content of each course offered by the program should be included in the Annexure as directed in Section 6.2 of the SAR template.

Please use the following format for preparing the course syllabi of each of the program's required and elective courses.

1. Course number and title
2. Credit hours:
3. Contact hours:
4. Course Prerequisites or Co-requisites:
5. Course Instructor/coordinator:
6. Brief description of the course contents (catalog description)
7. List of Text/Reference books including title, author, edition, publisher and year

CERTIFICATE OF COMPLIANCE

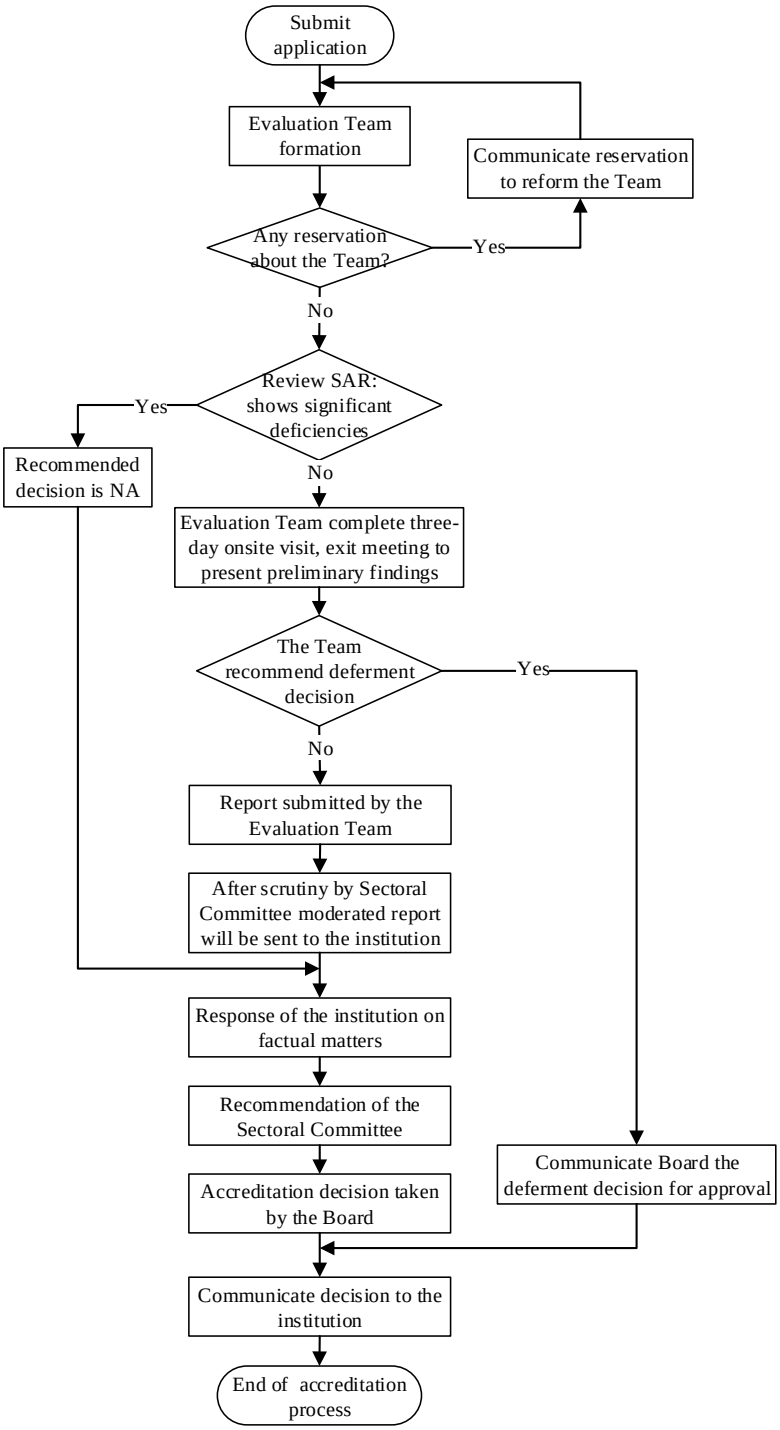
By signing below, we certified that all the information given in this Self-Assessment Report (SAR) for the accreditation of the _____ (Name of program) is correct to the best of our knowledge.

It is also attested that this report is prepared in compliance with the BAETE Accreditation Manual for Undergraduate Engineering Programs.

_____	_____
Name of the Head of the Department	Name of the Head of the Institution
_____	_____
Signature	Signature
_____	_____
Date	Date

ANNEX

Process Flow Chart I



Typical Evaluation Team Visit Schedule

II

DAY ONE

: 08.30 A.M.	Arrival of the evaluation team and discussion among team members
: 09.00 A.M.	Discussion with the Management (Vice-chancellor, Pro-Vice-chancellor, relevant dean, relevant chairperson)
: 10.00 A.M.	Discussion with students
: 12.00 P.M.	Visit to labs and classrooms
: 01.00 P.M.	Working lunch
: 02.00 P.M.	Discussion with faculty members
: 04.00 P.M.	Discussion with support staff
: 04.30 P.M.	Tea/Discussion among evaluation team members
: 05.00 P.M.	Departure

DAY TWO

: 08.30 A.M.	Arrival of the evaluation team and discussion among team members
: 09.00 A.M.	Visit to library, IT office, support departments, co- and extra-curricular facilities
: 11.00 A.M.	Tea
: 11.15A.M.	Visit to labs and classrooms (continued)
: 01.00 P.M.	Working lunch

: 02.00 P.M.	Examination of documents
: 03.00 P.M.	Discussion with alumni and employers
: 04.30 P.M.	Tea/Discussion among evaluation team members
: 05.00 P.M.	Departure

DAY THREE

: 08.30 A.M.	Arrival of the evaluation team and discussion among team members
: 08.30 A.M.	Examination of documents
: 10.30 A.M.	Seeking additional information, or making additional visits, if deemed necessary
: 11.00 A.M.	Tea.
: 11.15 A.M.	Finalization of the findings of the evaluation team
: 12.15 P.M.	Debriefing the program head
: 01.00 P.M.	Working lunch
: 02.30 P.M.	Exit meeting with the Management to report the findings of the evaluation team
: 03.00 P.M.	Departure

ANNEX

Evaluation Team Report Template

III

1. General Information

1.1 Institution

Name of the University	
Name of the Faculty	
Address	

1.2 Program for Accreditation

Name of the Program	
Abbreviation of the program	
Name of the Department	
Duration of the program	
Year of Graduation of First Batch	
Current Accreditation expires on (if applicable)	

1.3 Response of the program to the preliminary questions

Is the response of the program to all 09 (nine) preliminary questions affirmative	yes	no
List of the negative responses to the preliminary questions (if any)		
In case of any negative reply, accreditation evaluation is not necessary. Registrar, BAETE is to be contacted		

1.4 Evaluation Team

Team Chairperson (name)	
Team members (name)	
Observer (if any) (name)	

1.5 Date of Evaluation

Dates of Pre-visit Meeting	
Dates of On-site Visit	

2. Criteria

Evaluation for each criterion and sub-criterion (see Chapter 4 for details) falls under one of the following four categories: compliance, concern, weakness, deficiency. Justifications should be provided for evaluation of each sub-criterion and criterion. It should be noted that no sub-criterion is assigned any weight. Each criterion is to be holistically evaluated in terms of the qualitative bench-mark requirements.

Criterion 1: Organization and Governance			
Sub-criteria	Findings from SAR	Findings from onsite visit	Evaluation
i. Major positions of the institution are filled.			
ii. The statutory bodies/committees of the institution are formed in accordance with the applicable rules and guidelines.			
iii. The position appointees and committee members function effectively as per the roles defined in the relevant act/statute.			
iv. The institution has published policies including a mechanism for addressing grievance.			
v. The academic and administrative policies are put into practice.			
Overall criterion 1 (provide justification)			

Criterion 2: Financial and Physical Resources			
Sub-criteria	Findings from SAR	Findings from onsite visit	Evaluation
i. Financial resources are adequate for achieving institutional mission and appropriate functioning of the program. The financial resources committed to the program are also adequate for the appropriate functioning of the program.			
ii. The institution has a process for budget planning and allocate resources to the priority areas as required.			
iii. Campus infrastructure, extra- and co-curricular facilities, support facilities including maintenance are adequate for all the students and staff.			
iv. Any risk from manmade or natural hazards preferably be properly assessed and addressed in the Safety Plan, which addresses safety issues as the situation demands. Adequate measures are in place to make the campus safe for students, employees and visitors.			
v. Fire detection and fighting facilities are adequate.			

vi. All labs have their own plans to prevent and manage incidents and accidents.			
Overall criterion 2 (provide justification)			

Criterion 3: Faculty Members			
Sub-criteria	Findings from SAR	Findings from onsite visit	Evaluation
i. Department has adequate number of full-time faculty members.			
ii. The proportion of senior and junior faculty members preferably is appropriate.			
iii. The teacher-student ratio, class size and teaching load does not compromise opportunities for interaction.			
iv. The faculty members have adequate academic qualifications with specializations in areas closely related to the program(s) offered by the department.			
v. Faculty members preferably are motivated to improve their pedagogy and assist the students in achieving outcomes. They preferably are committed to the continuous quality improvement activities of the department.			
vi. Faculty members have the responsibility and authority to design and update the curriculum, establish course and program outcomes, and select and use appropriate assessment tools.			
vii. Faculty members are engaged in research, development and professional activities. They are preferably involved in relevant professional societies. The results of these activities preferably benefit the students.			
viii. The institution or department periodically arranges training for the faculty members on outcome-based education and assessment. All the faculty members are adequately trained on how to establish course outcomes, conduct teaching-learning activities that are appropriate for the outcomes and assess the level of outcome achievement.			
Overall criterion 3 (provide justification)			

Criterion 4: Students			
Sub-criteria	Findings from SAR	Findings from onsite visit	Evaluation
i. There is a published policy for the admission and transfer of students into the program. The admission or transfer requirements is preferably appropriate for the selection of students with the potential to achieve the program's outcomes.			
ii. The policy is implemented in practice. Transfer students show the attainment of program outcomes from courses in the institution.			
iii. Students' academic performance is continuously monitored in terms of the achievement of outcomes, and feedback are preferably provided to the students. Provisions for remedial or corrective measures preferably exist when necessary.			
iv. Every student is assigned an advisor who preferably counsels, guides and mentors the student.			
v. Students have opportunities to participate in extra- and co-curricular activities, and the activities of relevant professional societies. The institution preferably ensures the participation of a significant number of students.			
Overall criterion 4 (provide justification)			

Criterion 5: Academic Facilities and Learning Environment			
Sub-criteria	Findings from SAR	Final findings	Evaluation
i. The institution has a well-stocked library. The resources in the library are preferably adequate.			
ii. The number of classrooms is adequate and the classroom facilities and the environment are preferably conducive to learning.			
iii. The number of laboratories and equipment are adequate for conducting the program's various laboratory courses.			
iv. Every student has the opportunity for hands-on activity in the laboratories.			
v. Students and faculty members have access to adequate computing and Internet facilities.			
Overall criterion 5 (provide justification)			

Criterion 6: Curriculum and Teaching-Learning Process			
Sub-criteria	Findings from SAR	Findings from onsite visit	Evaluation
i. Curriculum satisfies relevant program-specific criteria.			
ii. Breadth and depth of the curriculum are appropriate for solving complex engineering problems in the relevant discipline.			
iii. Curriculum contains adequate number of courses on mathematics, physical science, humanities and non-engineering subjects.			
iv. The teaching–learning processes and activities are effective and appropriate for achieving relevant outcomes, including solutions for complex engineering problems and activities, where applicable.			
v. Adequate hands-on activities are an integral part of teaching and learning. Learning is preferably enhanced through student participation.			
vi. The program demonstrates the culmination of program outcomes (POs) at the level of solving complex engineering problems, preferably through a final-year design project or capstone project extending over a period of one year.			
Overall criterion 6 (provide justification)			

Criterion 7: Program Educational Objectives (PEO)			
Sub-criteria	Findings from SAR	Findings from onsite visit	Evaluation
i. PEOs are published and are clear, concise, assessable and realistic within the context of the available resources.			
ii. PEOs are consistent with the vision and mission of the institution or the department offering the program.			
iii. Curriculum and teaching-learning processes support the attainment of PEOs. Justifications are provided for how these contribute to the attainment of the PEOs.			
iv. A process is developed to assess the level of attainment of each PEO. Adequate evidence and documentation on the assessment of PEO attainment are provided. Assessment tools are			

preferably indicated, and the way in which these tools are used is preferably explained.			
v. PEO assessment leads to the periodic review of PEOs.			
Overall criterion 7 (provide justification)			

Criterion 8: Program Outcomes and Assessment			
Sub-criteria	Findings from SAR	Findings from onsite visit	Evaluation
i. POs specified by the program are significantly equivalent to the twelve graduate attributes or POs of BAETE.			
ii. POs contribute to each PEO.			
iii. The process involved in defining and refining the POs is described. The correlation between the course outcomes (COs) and POs are demonstrated through the mapping of COs onto POs.			
iv. Mapping demonstrates that each attribute of the Knowledge Profile (K1 – K8) is addressed in the curriculum. It is also demonstrated that the attributes of the Range of Complex Engineering Problems (P1 – P7) and Complex Engineering Activities (A1 – A5) are incorporated in the teaching, learning and assessment.			
v. Course file is maintained for each course. Course file preferably includes the assessment of outcomes, curriculum, examination questions and sample answer scripts, the results of other assessment tools and samples of corresponding student works, and a summary of performance and attainment of course outcomes with suggestions or feedback for future development.			
vi. POs are assessed using direct methods. In addition, indirect methods may also be used for PO assessment. The way in which various assessment tools, including examinations and rubrics, contribute to the evaluation of attainment of each PO are described. The results of the evaluation of PO attainment are shown.			
vii. It is demonstrated through evidence from appropriate evaluation that the students attain all the POs by the time of the graduation.			
Overall criterion 8 (provide justification)			

Criterion 9: Continuous Quality Improvement (CQI)			
Sub-criteria	Findings from SAR	Findings from onsite visit	Evaluation
i. The program demonstrates an established system for periodically compiling the level of attainment of PEOs, including a mechanism for tracking and obtaining feedback from graduates and their employers.			
ii. Findings of the CQI exercises for PEOs are evaluated, and the identified shortcomings and limitations are used to refine and improve the program.			
iii. POs are assessed on a regular cycle. The program prepares CQI file for each of the 12 POs to review considering feedback from relevant stakeholders including graduates.			
iv. Each course has clear quality requirements and facilitate the achievement of COs through teaching-learning and assessment methods.			
v. Course instructor prepares course review reports including CQI files for the courses he/she is teaching.			
vi. The program evaluates the curriculum and teaching quality on a regular basis while considering feedback from faculty members and students. The program demonstrates that the results of this periodic evaluation are used for continuous improvement.			
Overall criterion 9 (provide justification)			

Criterion 10: Interactions with the Industry			
Sub-criteria	Findings from SAR	Findings from onsite visit	Evaluation
i. The industry participates in the development of the curriculum to ensure that it is relevant, regularly updated, and meets the needs of the industry, particularly in areas experiencing rapid changes.			
ii. The program preferably has an Industry Advisory Panel (IAP) and an Alumni Association (AA) for this purpose. The IAP or AA may meet at certain intervals with the department to provide feedback.			

iii. The program provides students with the opportunity to obtain industrial experience through internships, industry visits or design projects conducted by practicing engineers and faculty members with industrial experience.			
Overall criterion 10 (provide justification)			

Any additional comment(s)

3. Strengths of the program and the institution

Strength in a criterion is demonstrated when the program or the institution significantly exceeds the bench-mark requirements for that criterion. The strengths of the program and the institution may be briefly highlighted as encouragement and in recognition of good practices.

4. Broad level recommendations

The Evaluation Team should provide some broad-level recommendations and suggestions to assist the program to improve without being prescriptive. Details of the corrective measures to be taken should not be prescribed.

5. Signatures of the members of the Evaluation Team

	Name	Signature with Date
Team Chairperson		
Team Members		

The recommendation made by the Evaluation Team has to be communicated separately to BAETE.