

# BOARD OF ACCREDITATION FOR ENGINEERING AND TECHNICAL EDUCATION

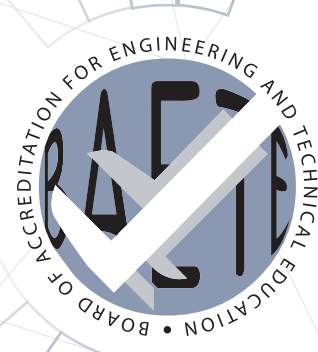
## Accreditation Manual for Undergraduate Engineering Programs





# BOARD OF ACCREDITATION FOR ENGINEERING AND TECHNICAL EDUCATION

## Accreditation Manual for Undergraduate Engineering Programs



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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



# 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 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 Council of IEB is empowered by the general body and formed the Board of Accreditation for Engineering and Technical Education (BAETE), as per IEB's constitution, to conduct the accreditation process and ensure the quality of engineering programs offered by institutions within the geographical jurisdiction of Bangladesh. The BAETE, subsequently referred to as "the Board," is entrusted by IEB to establish the policy, procedure, criteria, and related systems to conduct engineering program accreditation. As ensured by the IEB constitution, the BAETE works as an independent and autonomous body within IEB. The BAETE provides recommendations for the Council of IEB to frame by-laws regarding the function and management of the Board. In this regard, the IEB constitution also gives the Council authority to delegate powers to the Board.

### 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-chairman	1
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
Two Vice-chancellors from DUET/RUET/KUET/CUET/BUTex/BAU or their nominees at the Senior Professor level	2
One member from a private university with at least one BAETE-accredited program	1
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
Representative from the Accreditation Board/regional body of Asia & Pacific Countries	2
<b>Total</b>	<b>20</b>

The Board elects one of its members to act as the Member-Secretary. The term of office for the Chairman, Vice-Chairman and members that 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, usually for a period of three years.

A Sectoral Committee member may accompany the Evaluation Team for on-site moderation to ensure adherence to the BAETE manual. The relevant Sectoral Committee is responsible for scrutinizing the report submitted by the Evaluation Team to ensure its compliance with the Board’s accreditation policy, procedure, and criteria. The Sectoral Committee forwards its independent recommendations and the Evaluation team’s report to the Board. Sectoral Committee members should be well versed in the BAETE accreditation process. No member of the Sectoral Committee should be a member of a current Evaluation Team or the Board.

### **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.



# 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, viz., the UGC or any other appropriate government body.
- b. A duration of four years, after twelve years of schooling.
- c. Has graduated at least one cohort has graduated from the program.
- d. Follows outcome-based education.<sup>1</sup>
- e. Requires a minimum of 130 total credit hours.<sup>2</sup>

The following should be noted:

- i. The program applying for accreditation shall do so from its own obligation.
- 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 that the institution issues (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 prior approval of the BAETE.

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<sup>1</sup> Outcome-based education (OBE) is an educational theory that bases each part of an educational system on goals (outcomes).

<sup>2</sup> 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 apprehensions about future accreditation when its most senior cohort is in its second year. The Evaluation Team will identify strengths, weaknesses, opportunities and apprehensions 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. 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 observes any deficiency in the program that can be corrected within a short period, the Team may defer its decision for a specified time not exceeding twelve months. The institution may reapply within the specified period as soon as the deficiency is rectified without having to wait the minimum one year

required in the case of a “Not Accredited” decision. The Evaluation Team will report the deferment decision to the Board through the Sectoral Committee.

## **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 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.

# 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. 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 are 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 application is submitted the Sectoral Committee. 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.



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# Criteria

# 4

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This section presents the criteria a program must meet to become accredited. The following sub-sections sequentially outline the ten major criteria.

## **Organization and Governance 4.1**

Major positions should be filled, and the statutory bodies/committees of the institution should be formed in accordance with the applicable rules and guidelines. These include positions such as Vice Chancellor, Pro-Vice Chancellor, Treasurer, Dean, and Chairperson and bodies/committees such as the Board of Trustees, Syndicate, Academic Council, Admission Committee, Finance Committee, Curriculum Committee and the Faculty Selection Committee. The position appointees and committee members should function effectively as per the roles defined in the relevant act/statute.

The institution should have published policies, including a mechanism for addressing grievances, regarding academic and administrative matters involving students, faculty members and non-teaching employees. These policies should be put into practice.

## **Financial and Physical Resources 4.2**

The financial resources of the institution should be adequate to fulfill its mission and vision. Financial resources committed to the program should also be sufficient for the appropriate functioning of the program, including recruiting and retaining qualified faculty members, and procuring necessary lab equipment and equipment and tools to support teaching and learning.

The institution should have a process for budget planning and should allocate resources to the priority areas as required. 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, should be adequate for the total number of students and employees at the institution.

The possibility of any risk from manmade or natural hazards should be properly assessed and addressed in the Safety Plan. All labs shall have their own plans to prevent and manage incidents and accidents. Fire detection and fire-fighting facilities

should be adequate. An action plan is required to address safety issues as the situation demands. Adequate measures should be in place to make the campus safe for students, employees and visitors.

### **4.3 Faculty**

The department should 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.

The faculty members should have adequate academic qualifications with specialization in areas closely related to the program(s) offered by the department. The proportion of senior faculty members and junior faculty members should be appropriate. Adequate interaction between students and faculty members both within and outside classes are essential. The teacher-student ratio, class size and teaching load should not compromise opportunities for interaction.

Faculty members should be motivated to improve their pedagogy and assist the students with achieving outcomes. They should be committed to the continuous quality improvement activities of the department. Faculty members should 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.

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

### **4.4 Students**

A published policy for the admission and transfer of students into the program should exist. The admission or transfer requirements should be appropriate for the selection of students with the potential to achieve the program's outcomes. The policy should be implemented in practice.

Students' academic performance should be continuously monitored in terms of the achievement of the outcomes, and feedback should be provided to the students. There

should be provisions for remedial or corrective measures when necessary. Every student should be assigned an advisor. The advisor should counsel, guide and mentor the student on all academic and professional matters.

Students should 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**

The institution should have a well-stocked library. The books, journals and other resources available in the library should be adequate for the program and the faculty members. The number of classrooms available should be adequate to properly run the program. The classroom facilities and the environment should be conducive to learning.

The number of labs and equipment should be adequate for conducting the program's different labs. Every student should have the opportunity for hands-on activity in the laboratories.

Students and faculty members should have access to adequate computing and Internet facilities, including hardware, software tools and support.

### **Curriculum and Teaching-Learning Processes 4.6**

The curriculum should satisfy the relevant program-specific criteria described in Section 6.

The breadth and depth of the curriculum and the teaching-learning activities should be appropriate for solving complex engineering problems in the relevant discipline. The curriculum should contain an adequate number of courses on mathematics, physical science, humanities and non-engineering subjects.

The teaching-learning processes and activities selected for each course should be effective and appropriate for achieving the outcomes. Student participation and learning should be enhanced. Hands-on activities in the lab should be an integral part of teaching and learning. The program should include adequate activities in the lab.

There should be a final-year design project or capstone project extending over a period of one year that demonstrates the culmination of program outcomes at the level of solving complex engineering problems.

## 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. Each engineering program should have published PEOs that are clear, concise, assessable and realistic within the context of the available resources. The PEOs should be consistent with the vision and mission of the department offering the program. They should be supported by a curriculum and teaching-learning processes that lead to the attainment of these objectives. Justifications should be provided for how the curriculum and the outcomes contribute to the attainment of the PEOs.

A process should be developed to assess the level of attainment of each PEO to evaluate the academic program's effectiveness. Adequate evidence and documentation should be provided to support the achievement of a PEO using the established assessment and evaluation process. The tools should be indicated, and the way these tools are used should be explained. PEO assessment should lead to the periodic review of the PEO. Feedback from the various program stakeholders, including employers, alumni, students and faculty, should be considered during the review.

## 4.8 Program Outcomes and Assessment

Program Outcomes (POs) are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills and attitudes that students acquire 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) Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

**(b) Problem analysis:** Identify, formulate, research and analyze complex engineering problems and reach substantiated conclusions using the principles of mathematics, the natural sciences and the engineering sciences.

**(c) Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs



with appropriate consideration for public health and safety and of cultural, societal and environmental concerns.

**(d) Investigation:** Conduct investigations of complex problems, considering experimental design, data analysis and interpretation and information synthesis to provide valid conclusions.

**(e) Modern tool usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to complex engineering activities with an understanding of their limitations.

**(f) The engineer and society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

**(g) Environment and sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.

**(h) Ethics:** Apply ethical principles and commit to the professional ethics, responsibilities and the norms of the engineering practice.

**(i) Individual work and teamwork:** Function effectively as an individual and as a member or leader of diverse teams and in multidisciplinary settings.

**(j) Communication:** Communicate effectively about complex engineering activities with the engineering community and with society at large. Be able to comprehend and write effective reports, design documentation, make effective presentations and give and receive clear instructions.

**(k) Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's work as a team member or a leader to manage projects in multidisciplinary environments.

**(l) Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent, life-long learning in the broadest context of technological change.

In addition to incorporating the above-listed POs, the educational institution may include additional outcomes in its learning programs. An engineering program that aims to develop the abovementioned POs must ensure that its curriculum encompasses all the desired elements of the knowledge profile, as presented in Table 4.1. The ranges of Complex Problem Solving and Complex Engineering Activities 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 formal aspects of computer and information science to support analysis and modelling 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 of the identified issues in engineering practice in the discipline: ethics and the engineer's professional responsibility to public safety; the impacts of engineering activity in economic, social, cultural, environmental and sustainability terms
K8	Engagement with selected knowledge in the research literature of the discipline

Table 4.2: Range of Complex Problem<sup>3</sup> Solving

Attribute	Complex Problems
Range of conflicting requirements	Involve wide-ranging or conflicting technical, engineering and other issues
Depth of analysis required	Have no obvious solution and require abstract thinking and originality in analysis to formulate suitable models.
Depth of knowledge required	Require research-based knowledge, much of which is at or informed by the forefront of the professional discipline, that allows a fundamental-based, first-principles analytical approach
Familiarity of issues	Involve infrequently encountered issues
Extent of applicable codes	Are outside the problems encompassed by standards and codes of practice for professional engineering
Extent of stakeholder involvement and level of conflicting requirements	Involve diverse groups of stakeholders with widely varying needs
Consequences	Have significant consequences in a range of contexts
Interdependence	Are high-level problems that include many component parts or sub-problems

<sup>3</sup> Engineering problems that cannot be resolved without in-depth engineering knowledge and have some or all of the characteristics mentioned in Table 4.2.

Table 4.3: Range of Complex Engineering Activities<sup>4</sup>

Attribute	Complex Problems
Range of resources	Involve the use of diverse resources (for this purpose, resources include people, money, equipment, materials, information and technologies)
Level of interaction	Require the resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues
Innovation	Involve the creative use of engineering principles and research-based knowledge in novel ways
Consequences for society and the environment	Have significant consequences in a range of contexts, characterized by their difficulty of prediction and mitigation
Familiarity	Are outside the problems encompassed by standards and codes of practice for professional engineering

The program should describe the process involved in defining and redefining the POs. The correlation between the POs and the PEOs is to be provided by mapping the POs onto PEOs to establish the contribution of the POs to the attainment of the PEOs. Similarly, the correlation between the Course Outcomes (COs) and POs should be demonstrated through the mapping of COs onto POs. The way that assessment tools and lab and project coursework contribute to the attainment of the POs should be demonstrated through rubrics or mapping exercises.

For each course, a course file is expected to be maintained. The course file may include the assessment of outcomes, curriculum, exam questions and answer scripts, the results of other assessments, and a summary of performance and attainment with suggestions or feedback for future development.

POs may be assessed using direct and indirect methods. Direct methods of assessment are accomplished through the direct examination or observation of students' knowledge or skills against measurable performance indicators. Indirect methods of assessment are based on opinions or self-reports from different stakeholders. Rubrics are useful tools for indirect assessment.

## Continuous Quality Improvement 4.9

The program should have a continuous quality improvement mechanism. It should demonstrate an established system for periodically compiling the level of attainment in terms of PEO, including a mechanism for tracking and obtaining feedback from

<sup>4</sup> Complex activities are (engineering) activities or projects that have some or all of the characteristics mentioned in Table 4.3.

graduates and their employers. The outcomes of these exercises should be evaluated, and the identified shortcomings and limitations should be used to refine and improve the program.

POs should be assessed on a regular cycle. Each teaching module should have clear quality requirements and facilitate the achievement of COs through teaching and evaluation methods. Students should provide feedback in every course on the appropriateness of the COs, course content, delivery of content, assessment and the attainment of COs. The program should evaluate the curriculum and teaching quality on a regular basis while considering feedback from faculty members and students. The program should demonstrate that the results of this periodic evaluation are used for continuous improvement.

#### **4.10 Interactions with the Industry**

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. There must be industry participation 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. An engineering 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.

The program should 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.

# 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 evaluation team's composition. The Sectoral Committee will notify the evaluation team 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 Evaluation Team's Chairperson 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 Evaluation Team Chairperson, 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.

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.

## 5.2 Composition and Selection of Evaluation Team

The BAETE maintains a data bank of its trained program evaluators from which potential Evaluation Team 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 training also help to 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





# 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 such topic 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.



# Self-Assessment Report Format

# 7

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.

## General Information

1. Program title \_\_\_\_\_  
Abbreviation \_\_\_\_\_
2. 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. Nature of program UG (Eng.)
11. Year the university was established \_\_\_\_\_
12. Year the program began \_\_\_\_\_
13. Information about previous accreditation  
Applying for the first time? Yes No  
Was granted accreditation for .....years in 20.....  
Applied in 20..... but was not accredited/deferred

**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 required to graduate from the program?  
Yes \_\_\_\_ No \_\_\_\_
7. Are the Vice Chancellor, Pro-Vice Chancellor and Treasurer appointed according to the relevant act/statute?  
Yes \_\_\_\_ No \_\_\_\_
8. Do statutory bodies (e.g., Syndicate, Academic Council, Finance Committee, Disciplinary Committee, Faculty Recruitment Committee) exist, and are they functional?  
Yes \_\_\_\_ No \_\_\_\_
9. Does the department offering the program have an adequate number of full-time faculty members, including senior faculty members, with relevant academic specialization?  
Yes \_\_\_\_ No \_\_\_\_
10. 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 ten questions above are positive. The program will not be evaluated if the answer to any of the ten questions is negative. The application will not be accepted.

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

The following documents must also be provided as an attachment/annexure.

- (i) Latest copy of the prospectus of all programs and a copy of the institution's latest academic calendar.
- (ii) Copy of the letter of approval to establish the institution from the appropriate authority.
- (iii) Copy of the letter of approval to establish the program.
- (iv) Copy of statutes/academic ordinances.
- (v) List of members of the statutory committees in accordance with the acts/statutes.

The SAR template is presented on the following pages.



## Criterion I: Organization and Governance

---

### I.1 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

### I.2 Statutory positions and bodies of the institution

#### I.2.1 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.

#### I.2.2 Formation of the statutory bodies

For each syndicate, academic council, finance committee, faculty selection committee and disciplinary committee, prepare a table as follows:

Name and affiliation of member	Membership capacity	From - to

#### I.2.3 Function of the statutory bodies

Dates of the meeting(s) of the following bodies over the last three calendar years. Attach copies of meeting notices.

- Syndicate
- Academic council

- Finance committee
- Disciplinary committee

### **I.3 Existence of and adherence to policies**

#### **I.3.1 Documented policies (booklet, brochure, webpage)**

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

#### **I.3.2 Adherence to policies**

This issue will be evaluated by the evaluation team during the on-site visit.

### **I.4 Grievance redress system**

Present documents pertaining to the existence of a grievance redress mechanism, if any.

### **I.5 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.

### **I.6 Convocation**

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

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

### 2.1.2 Adequacy of budget

State the amount budgeted and the actual expenditure for the following program sectors for each of the last three calendar years:

- Salary of the faculty members
- Salary of the non-teaching staff
- Laboratory
- Physical infrastructure (space, furniture, etc.)
- IT
- Maintenance

### 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 given to students as scholarships and financial aid during each of the last three calendar 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 year.

### 2.4 Safety measures: infrastructure, practices, training and compliance

Provide details for the following.

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

### 2.5 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.

### 2.6 Placement center

State the designated activities and functions of the placement center, if such a center exists. Additionally, state the name and designation of each staff member along with his/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 calendar years, as per the following table. Additionally, provide detailed curricula vitae for each faculty member, including a list of publications, in the Appendix.

Name	Designation	Highest academic degree	Total teaching experience	Industrial experience (if any)	Date of joining this institution	Total weekly teaching load (in hours)

### 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 calendar years, as per the following table. Additionally, provide detailed curricula vitae for each faculty member, including a list of publications.

Name	Designation at the home institution	Highest academic degree	Total teaching experience	Industrial experience (if any)	Date of joining at this institution	Total weekly teaching load (in hours)

### 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 calendar years. In the Appendix, 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 calendar years.

### 3.4 Student-teacher ratio

Calculate the student-teacher ratio for each semester during the last three calendar years. Describe in detail the calculation procedure and justify the appropriateness of the adopted calculation model.

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

Complete the following table for each semester during the last three calendar years. Include each full-time faculty member who served during the respective semester.

Name	Designation	List of papers published in this semester	List of consulting works engaged in this semester	List of professional society activities engaged in this semester

### 3.6 Role of faculty members in directing the course of and improvements in the program

Describe in detail the role the faculty members play 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 calendar years 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. Attach a notice for each meeting and the list of attendees in the Appendix.

Date	Title of the training event	Number of attendees	Remarks

## Criterion 4: Students

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### 4.I Existence of and adherence to a well-formulated admission policy, including admission criteria

Describe the admission policy and provide details (attach published brochures/guidelines, websites, etc.).

State any preferences/priorities in admissions/quotas. Provide the number of students admitted for each semester of the last three calendar years in table form.

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

#### 4.2 Policy for transfer students

Describe the policy for accepting transfer students into the program and provide details (attach published brochures/guidelines, web, etc.).

State how many students admitted into the program have transferred credits earned elsewhere, as per the following table, for each semester of the last three calendar years.

Serial number	Number of transferred credits	Institution where transferred credits were earned

#### 4.3 Continuous monitoring of student performance

Describe the process for continuously monitoring students' academic performance.

Describe the process of providing continuous feedback to students regarding their academic performance and outcome achievement. What corrective measures are in place to help students who fall behind? Describe.

#### 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 each semester of the last three calendar years, as per the following table.

Name of the faculty member	Designation	No. of advisees assigned

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' co-curricular activities. State how these activities are encouraged/supported institutionally. List students in the program who participated in student activities at the institutional level or higher in the past three calendar years. Additionally, mention notable achievements, if any.

#### 4.6 Professional society activities

State the names of professional societies that have a student branch/chapter and describe related support/facilities/activities within the institution. Additionally, provide a list of the names of the student members of each branch/chapter for each of the last three calendar years.

### Criterion 5: Academic Facilities and Technical Support

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#### 5.1 Library

In cases where more than one library exists, state the total, including all libraries.

##### 5.1.1 Space and hours of operation

State the total space allocated for the library and the number of students the library serves. State the library's business hours.

##### 5.1.2 Library resources (books, technical journals, proceedings, etc.)

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)		
Journals (hard copy)		
Journals (electronic)		
Proceedings (hard copy)		
Proceedings (electronic)		
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 adequacy of the number of appropriately equipped classrooms for the program. Provide data and enumerate with examples, if necessary.

## 5.3 Laboratories and equipment

### 5.3.1 Laboratories for all relevant courses of the curriculum

Only the institution's own labs will be considered. Labs at other institutions that are used/shared will not be considered. List all the lab courses and the corresponding name and location of the lab where the classes are conducted. Prepare a table for each semester of the last three calendar years.

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

### 5.3.2 Availability of equipment

For each lab, prepare a table of the equipment, quantity of each item of equipment, date and cost of purchase, etc.

Name of the laboratory:

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

### 5.5 Full-time technical support staff for labs (technician/instructor and assistant)

For each lab, list the full-time technical support staff.

Name of the laboratory:

Serial number	Name	Designation	Qualification (education, training)	Experience (years)

### 5.6 Internet and computing facilities

State the Internet facilities available for the students. Required information includes total bandwidth, number of PCs with Internet connections, daily hours that the services are available to students and areas covered by Wi-Fi (include only if students have access to Wi-Fi).



State the number of labs, including the number of PCs, that are accessible to students outside of class/lab times. Mention the types of uses that are available to students. PCs/laptops in the library or in any other common place may be considered if such facilities are available.

## **Criterion 6: Curriculum and Teaching-Learning Processes**

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### **6.I Curriculum**

#### **6.I.1 Minimum credit hours**

State the minimum number of credit hours required to earn the degree. Express the number in contact hours, explaining the calculation method used.

#### **6.I.2 Course content**

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 Appendix, as per the following table. State the category of each course, e.g., mathematics, basic science, language, humanities, non-engineering skills, core engineering, etc. Note that humanities courses refer to 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 required for the program or an elective.

Course no.	Course title	Credit hours	Contact hours	Category	Required/elective

#### **6.I.3 Flow chart**

Submit the semester-by-semester flow chart of the program in the Appendix.

#### **6.I.4 List of offered courses and lecture plans**

Submit the program's course offering list for each semesters of the last three calendar years in the Appendix.

Submit the lecture plan for each course offered for each semester of the last three calendar years.

#### **6.I.5 Course files**

The department should prepare a course file for each course offered each semester of the last three calendar years. If a lab is integrated with theory in any course, separate course files should

be prepared for the theory and the lab sections of the course. The course files shall be 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 course outcomes and contents, assessment tools for each course outcome, and grading policy
- Questions and three representative examples responses (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 assignment/project reports. Three representative examples for each assignment and project report
- Final grade assigned to each student
- Assessment and analysis of outcome achievement
- The course instructor's recommendations for continuous quality improvement

### 6.2 Lab activities

State how the department gives importance to hands-on lab activities and what measures are in place to emphasize lab activities.

Provide the list of 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

Provide a list of the titles of final-year design projects completed in each semester of the last three calendar years, as per the following table. The original final reports shall be made available during the on-site visit for perusal by the members of the evaluation team.

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

### 6.4 Teaching-learning activities

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

### 6.5 Academic calendar

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

## Criterion 7: Program Educational Objectives (PEOs)

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### 7.1 Mission and Vision

- State the institution’s vision and mission
- State the vision and mission of the program offered by the department/faculty/school

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

State the Program Educational Objectives (PEOs) and show their relationship with the institution’s mission, as per the following table.

No.	PEO statement	Institutional missions				
		Mission statement 1	Mission statement 2			Mission statement n

Indicate the correlation using either binary levels (yes/no) or ternary levels (high/low/none).

### 7.3 Relationship between the POs and PEOs

Show the relationship between the POs and PEOs in the following table.

No.	PO statement	PEO 1	PEO 2	..	..	PEO n

Indicate the correlation using either binary levels (yes/no) or ternary levels (high/low/none).

### 7.4 Process for of PEO measurement

Describe the process used to measure the achievement of each PEO. Submit copies of relevant documents (meeting minutes, survey results, etc.) that support the assertion. In particular, state how different stakeholders are involved in the process.

Describe how the PEO measurement results are used to redefine and improve the PEOs.

### Criterion 8: Program Outcomes (POs) and Assessment

#### 8.I Course outcomes (COs)

##### 8.I.I Statements of COs

State the COs for each course offered for the program by the department, as per the following table.

Sl. No.	COs	Corresponding POs	Bloom's taxonomy domain/level	Delivery methods and activities	Assessment tools

##### 8.I.2 Assessment of COs

Describe how the attainment of COs is assessed in each course. The processes and attainment criteria should be clearly stated. Submit evidence of CO assessment for the courses considered in each semester of the last three calendar years in the Appendix.

#### 8.2 Relationship between COs and POs

For each course of the program offered by the department, present a map of COs and POs, as per the following table. Alternatively, the following information may be presented graphically.

Course no.	COs	POs-1	POs-2	..	..	POs-n

Indicate the correlation using either binary levels (yes/no) or ternary levels (high/low/none).

##### 8.3 Achievement of POs required by the BAETE

Demonstrate and provide appropriate evidence that each of the POs required by the BAETE has been achieved by the time of graduation. Clearly state and justify the assessment tools and assessment criteria used.

##### 8.4 Achievement of additional POs

Provide appropriate evidence demonstrating that each additional PO required by the department/school/faculty/institution has been achieved by the time of graduation. Clearly state and justify the assessment tools and the assessment criteria used.

## **Criterion 9: Continuous Quality Improvement (CQI)**

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### **9.I Feedback from students**

#### **9.I.1 Student evaluation of courses**

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

Explain how students' evaluations of courses/instructors are analyzed and utilized to update and improve PEOs/POs/COs/curriculum/delivery and assessment methods. Provide copies of documents (meeting minutes, analysis reports, etc.) that support the given explanation.

#### **9.I.2 Student survey**

Please 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 Appendix. Explain how the survey results are utilized to update PEOs/POs/COs/curriculum/delivery and assessment methods. Provide copies of documents (meeting minutes, analysis reports, etc.) that support the given explanation.

### **9.2 Feedback from course instructors**

Explain how the feedback from course instructors is utilized to update PEOs/POs/COs/curriculum/delivery and assessment methods. Provide copies of documents (meeting minutes, analysis reports, etc.) that support the given explanation.

### **9.3 Feedback from external stakeholders**

#### **9.3.1 Feedback from alumni**

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

Explain how the feedback from alumni is utilized to update PEOs/POs/COs/curriculum/delivery and assessment methods. Provide copies of documents (meeting minutes, analysis reports, etc.) that support the given explanation.

#### **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, etc.).

Explain how the feedback from the employers is utilized to update PEOs/POs/COs/curriculum/delivery and assessment methods. Provide copies of documents (meeting minutes, analysis reports, etc.) that support the given explanation.

#### 9.4 CQI loops

Describe the CQI loops for COs, POs and PEOs. In particular, discuss how achievements of outcomes and objectives are assessed, analyses are conducted and improvements are made. Provide copies of documents (survey results, analysis reports, meeting minutes, etc.) to justify each statement.

#### 9.5 Addressing deficiencies, weaknesses and concerns identified during the previous accreditation evaluation(s) (not applicable for new accreditation applications)

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

	Statement	Remedial actions taken	Improvements made
Deficiencies			
Weaknesses			
Concerns			

### Criterion 10: Interactions with the industry

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#### 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 calendar years. The minutes of these meetings should be made available to members of the Evaluation Team for perusal during the on-site visit.

#### 10.2 Participation of the industry in academic updates

Explain how industrial participation is ensured in the update and improvement of the objectives, outcomes and curriculum to ensure that these remain relevant to the industry. Provide copies of documents in support of the given explanation.

#### 10.3 Students' opportunities to gain industrial experience

##### 10.3.1 Internship

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.

### **10.3.2 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.

### **10.3.3 Industry visits**

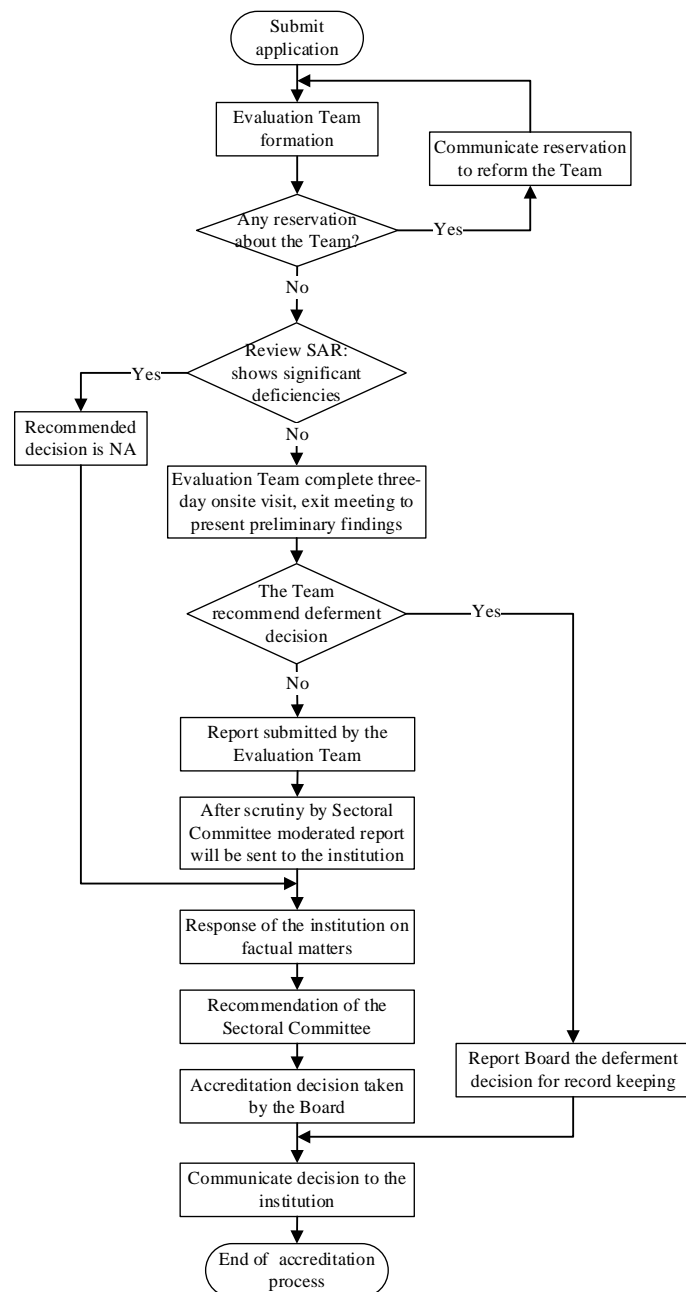
State whether the students in the program are required to visit companies within the industry. If yes, provide details regarding the nature of such visits. Explain how student learning and outcome achievement as a result of such visits are assessed. Provide copies of documents that support the given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





# Process Flow Chart

# I





# Typical On-site Activities **II**

## Activities during the Visit **1**

The evaluation team requires a 3-day visit in order to complete the assessment process. Recent examination papers laboratory instruction sheets, student transcripts and student reports, and such other materials that may be of relevance in assessing the student performance, should be made available to the experts during their Visit. Textbooks, teaching assignments and lecture files which the faculty uses for instruction and continuous evaluation of students should also be made available for the perusal of the team. Qualitative factors such as professional attitudes, staff commitment, intellectual atmosphere and morale should also be assessed.

Specially the following activities are expected to be completed by the Evaluation Team during the visit.

1. Discussion with appropriate Senior Administrative Officers who from part of the Management, including the Vice- Chancellor (in case of University Constituent College)/ Principal/Dean/Head of the Department of the concerned Program.
2. Discussion with groups of faculty members, and, if necessary, individuals to assess professional attitudes, commitment, and morale and intellectual atmosphere.
3. Discussions with students and alumni, if available, for feedback.
4. Discussions with supporting staff and the service departments.
5. Visits to laboratories, library, computer centre, centre for extension activities, placement cell, sports and medical facilities.
6. Perusal of all the documents furnished by the Department/Institution.
7. A final meeting with Senior Administrators and others referred to in (1), to explain the strength and weaknesses of the Program, as observed by the team.

## Schedule of the Evaluation Team **2**

The following is a typical schedule for the visits. However, depending on the needs and requirements of the Institution, the schedule may be altered by the Chairman. Members are encouraged to have post dinner meetings among themselves every night during their stay.

**DAY ONE**

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

**DAY TWO**

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- : 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, etc.
- : 11.00 A.M. Tea.
- : 11.15 A.M. Discussion with the students.
- : 01.00 P.M. Working lunch.
- : 02.00 P.M. Examination of documents/Visits to classrooms/labs.
- : 04.30 P.M. Tea/Discussion among the evaluation team members.
- : 05.00 P.M. Departure.

**DAY THREE**

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- : 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.
- : 11.30 A. M. Finalization of the findings of the evaluation team.
- : 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.