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annual

for Accreditation of Undergraduate
Engineering Programs
(Tier I Institutions)

National Board of Accreditation (NBA)
New Delhi

Manual

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Engineering Programs

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Vision

To be an accrediting agency of international standard by ensuring the highest degree of credibility in assurance of quality and relevance to professional education and come up to the expectations of its stakeholder's viz., academicians, corporates, educational institutions, government, industry, regulators, students and their parents..



Mission

To stimulate the quality of teaching, self-evaluation and accountability in the higher education system, which help institutions realize their academic objectives and adopt teaching practices that enable them to produce high-quality professionals and to assess and accredit the programs offered by the institutions imparting technical and professional education.

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PART - I

1. Introduction

1.1. National Board of Accreditation

The National Board of Accreditation (NBA) was set-up in September 1994 by the AICTE to assess the qualitative competence of the programs offered by technical and professional educational institutions from diploma level to post-graduate level in engineering and technology, management, pharmacy, architecture and related disciplines, which are approved by appropriate statutory regulatory bodies.

NBA came into existence as an independent autonomous body with effect from 7th January 2010 with the objectives of assurance of quality and relevance to technical education, especially of the programs in technical disciplines, i.e., Engineering and Technology, Management, Architecture, Pharmacy and Hospitality, etc., through the mechanism of accreditation of programs offered by technical and professional institutions. The Memorandum of Association and Rules of NBA were amended in April 2013, to make it completely independent of AICTE, administratively as well as financially. NBA conducts evaluation of programs of technical institutions based on evaluation criteria and parameters laid down by its Committees and Council.

NBA works closely with all the stakeholders to ensure that the programs serve to equip graduates with sound knowledge of fundamentals of the discipline and to develop in them an acceptable level of professional competence that would meet the needs of profession and be adequate for the responsible fulfilment of professional assignments.

1.2. Objectives

Major objectives of the NBA for engineering education are as follows:

- ☞ To assess and accredit the engineering education programs at diploma, degree and post-graduate level;
- ☞ To evolve standards and parameters for assessment and accreditation in line with the parameters laid down by the appropriate statutory regulatory authority for co-ordination, determination and regulation of standards in the concerned field of technical education;
- ☞ To promote excellence through a bench marking process, which is helpful in determining whether or not an institution is able to achieve its mission and broad based goals, and in interpreting the results of the outcomes assessment process;
- ☞ To promote quality conscious system of technical education where excellence, relevance to market needs and participation by all stakeholders are prime and major determinants.
- ☞ To build a technical education system as facilitator of human resources, that will match the national goals of growth by competence, contribution to economy through competitiveness and compatibility with societal development;

- ☞ To set the quality benchmarks targeted at global and national stockpile of human capital in all fields of technical education;
- ☞ To conduct evaluation of self-assessment of technical institutions and/or programs offered by them on the basis of guidelines, norms and standards specified by it; and
- ☞ To contribute to the domain of knowledge in quality parameters, assessment and evaluation.

1.3. Governance Structure

The NBA is empowered by its Memorandum of Association (MoA). The governance of NBA is effected through the following three statutory committees enshrined in its MoA:

- i) The General Council (GC)
- ii) The Executive Committee (EC)
- iii) The Academic Advisory Committee (AAC)

Details of the constitution, functions and responsibilities of the above Committees are provided in the MoA of NBA and are available at <http://www.nbaind.org/files/moa-rules-of-society.pdf>.

All these committees are chaired by the Chairman, NBA.

Member Secretary is the Member Secretary of these committees. Member Secretary is the Executive Authority of NBA.

Besides, the NBA also have the following other committees and sub-committees:

- ☞ **Sub-Committee of AAC of Engineering & Technology functions** separately to evolve standard for assessment and accreditation, to form assessors' panels, to lay down guidelines for assessors, to evaluate and approve the recommendations of the Evaluation and Accreditation Committee (EAC).
- ☞ **Evaluation and Accreditation Committee (EAC)** of Engineering & Technology reviews the reports of the evaluation team and submits its recommendations on accreditation to the Sub Committee of AAC.
- ☞ **Appellate Committee** considers the appeal applications made by the institutions against the decision on accreditation of a program by NBA and gives its recommendations to the Academic Advisory Committee (AAC).

1.4. Tier I Institutions

The categories of institutions that qualify for Tier I accreditation for undergraduate engineering/technology programs through NBA are given below:

- ☞ Institutions of National importance (Indian Institutes of Technology (IITs), Indian Institute of Science (IISc) and Indian Institutes of Information Technology (IIITs) etc.
- ☞ National Institutes of Technology (NITs).
- ☞ Central Universities (Universities established by or under Act enacted by Parliament of India).
- ☞ State Universities (Universities established by or under legislation enacted by the legislature of the concerned States).
- ☞ Private Universities (Universities established by or under legislation enacted by the State legislature but promoted by private trusts, societies, companies under Section 8 of Indian Companies Act).
- ☞ Deemed-to-be-Universities (Institutions declared as Deemed-to-be-Universities by MHRD).
- ☞ Institutions declared as Autonomous by a competent empowered authority.

These institutions have freedom to design, develop and update curricula and also have complete academic autonomy.

1.5. Washington Accord

The Washington Accord is an international and multi-lateral agreement among bodies responsible for accrediting undergraduate engineering degree programs, originally signed among six countries in 1989. It recognizes the substantial equivalency of programs accredited by bodies that are its signatory and recommends that graduates of programs accredited by any of the signatory bodies be recognized mutually as having met the academic requirements for entry to the practice of engineering in the area of their jurisdiction. The NBA became a provisional member of the Washington Accord (WA) in 2007 and was given the status of permanent signatory on 13th June 2014. Signatory status is subject to the condition that only programs of Tier I institutions accredited by NBA are eligible for mutual recognition under the Washington Accord.

PART - II

2. Accreditation Policy

2.1. General Information on Accreditation

The following general policies are the guiding principles for accreditation of programs offered by various technical institutions:

- i) NBA accredits technical programs of institutions and not the institution or its departments/centres as a whole.
- ii) Institutions are required to apply for accreditation through eNBA portal as per norms prescribed by NBA from time-to-time.
- iii) Programs to be accredited should be offered by an educational institution, which has been formally approved by the AICTE or the concerned regulatory authority.
- iv) Programs from which at least two batches of students have graduated are considered for accreditation. The program should continuously be running without break with approval of the concerned regulatory authority during the whole duration of last two batches (for example: 5 years for UG Engineering, 3 years for PG Engineering, etc.).
- v) One batch of students must pass out under the autonomous status of the institution and that batch shall be taken as the batch which would be in the first year, in the academic year in which the institution attains autonomy and subsequently passes out after 4 years.
- vi) When an institution gets autonomous status for the first time, it can apply in Tier II in the interim period, if it wishes to, before one batch of students passes out under autonomous status. After one batch of students under autonomous status passes out, the institution shall have to apply for accreditation of its UG programs in Tier I only.
- vii) For all the cases in which an institution gets academic autonomy either from the UGC or from the affiliating University, it becomes autonomous and is required to apply for accreditation of its UG Engineering programs in Tier I only.
- viii) The institution is required to pay accreditation fee as prescribed by NBA from time-to-time. The application fee is payable in two phases – 10 per cent at the time of submission of Pre-Qualifiers and balance 90 per cent fee at the time of submission of SAR, once the Pre-Qualifiers are approved.
- ix) The institution must submit Self-Assessment Report (SAR) online through e-NBA portal in the prescribed format in respect of each program proposed for accreditation.
- x) The title of a program to be accredited must be the same as shown on the graduating student's degree and the approval letters of the concerned regulatory authority.

- xi) Visiting Team, while evaluating the programs, should ascertain overlapping of resources and faculty for programs in an institution where AICTE has granted approval for 1st shift and 2nd shift.
- xii) Part-time programs are not considered for accreditation.
- xiii) Programs are evaluated in accordance with the accreditation criteria as specified by NBA.
- xiv) Institutions are required to represent the accreditation status of each program accurately and without ambiguity. If accreditation is withdrawn or discontinued or expires, the institution should no longer refer to the program as accredited.
- xv) A two/three day's onsite visit is a part of the accreditation process. A Visiting Team appointed by the NBA carries out the evaluation of the program. The institution is required to propose such sets of dates for the visit when the regular classes and all academic activities of the program applied for, are going on.
- xvi) Institutions have the option of withdrawing a program during the Exit Meeting of the visit. The institution shall handover a written request to the Team Chair during the Exit Meeting. No communication regarding withdrawal will be accepted after the Visiting Team has left the institution. No fee would be refunded in such cases.
- xvii) The final decision made by the NBA is communicated to the educational institution, together with comments detailing strengths, weaknesses and scope for improvement.
- xviii) A copy of the report of the Visiting Team is sent to the institution along with the accreditation status in order to maintain the transparency. In the event of change of the decision from the Visiting Team to the decision making team, the reasons for changes are also conveyed along with the Visiting Team report.
- xix) If an institution is not satisfied with the decision of NBA regarding accreditation status, it may appeal against the decision to the Appellate Committee (AC) of NBA within 30 days of receipt of the communication.
- xx) Commencement of Accreditation Period:
 - ☞ In case visit of the Expert (Visiting) Team to an Institution is conducted between 1st July - 31st December, the period of accreditation would commence from the on-going academic year (i.e. with effect from 1st July of the on-going academic year).
 - ☞ In case visit is conducted between 1st January to 30th June, the accreditation period would be from the next academic year (i.e. with effect from 1st July of the next academic year).
 - ☞ Same rules apply for deciding the validity period of accreditation periods of programs in appeal cases also.

- xxi) If a program is 'not accredited' or withdrawn during the visit, a fresh application for accreditation of the same program can be considered one year after the date of previous visit of the Visiting Team.
- xxii) If an institution requests postponement of the visit of the Expert Team after the team has already been constituted for the purpose, an additional fee of 25% shall be required to be paid before the visit is rescheduled. If the institution causes cancellation of the visit after the team has already been constituted for the purpose, there would be a cancellation fee of 25% deducted from the fees paid by the institution. In case, an institution requests for withdrawal of the program(s) applied by it after application has been approved by the NBA for further processing and the fee has been paid by the institution, 10% of the accreditation fee per program shall be deducted while refunding the fee as per the request of the institution.

2.2. Outcome-based Education and Accreditation

Outcome based education is targeted at achieving desirable outcomes (in terms of knowledge, skills, attitudes and behaviour) at the end of a program. Teaching with this awareness and making the associated effort constitutes outcome based education. This entails a regular methodology for ascertaining the attainment of outcomes, and benchmarking these against the program outcomes consistent with the objectives of the program.

Initially, NBA accreditation used to be based on 'Input – Process – Output' model with major emphasis on availability of resources / facilities and the outputs thereof. In the year 2009, NBA aligned its methodology with international benchmarks and started accreditation on the basis of outcomes. It believes that educational quality must be measured by outcomes rather than inputs, because inputs do not necessarily correlate with quality outcomes. Outcomes are dependent not only on inputs but also on the processes followed by an institution to convert inputs into defined outcomes.

PART - III

3. Accreditation Criteria

3.1. Accreditation Criteria

The assessment and evaluation process of accreditation of an engineering program is based on 10 broad criteria developed through a participatory process involving experts from reputed national-level technical institutions, industries, R&D organizations and professional bodies. Each criterion relates to a major feature of institutional activity and its effectiveness. The criteria have been formulated in terms of parameters, including quantitative measurements that have been designed for maximal objective assessment of each feature.

The definitions of the terms used in this manual are as follows:

- (a) **Mission and Vision Statement** – Mission statements are essentially the means to achieve the vision of the institution. For example, if the vision is to create high-quality engineering professionals, then the mission could be to offer a well-balanced program of instruction, practical experience, and opportunities for overall personality development. Vision is a futuristic statement that the institution would like to achieve over a long period of time, and Mission is the means by which it proposes to move toward the stated Vision.
- (b) **Program Educational Objectives (PEOs)** – Program Educational Objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.
- (c) **Program Outcomes (POs)** – Program Outcomes are statements that describe what students are expected to know and be able to do upon graduating from the program. These relate to the skills, knowledge, attitude and behaviour that students acquire through the program. NBA has defined the Program Outcomes for each discipline.
- (d) **Course Outcomes (COs)** – Course Outcomes are narrower statements that describe what students are expected to know, and are able to do at the end of each course. These relate to the skills, knowledge and behaviour that students acquire in their progress through the course.
- (e) **Assessment** – Assessment is one or more processes, carried out by the institution, that identify, collect, and prepare data to evaluate the achievement of Program Educational Objectives and Program Outcomes.
- (f) **Evaluation** – Evaluation is one or more processes, done by the evaluation team, for interpreting the data and evidence accumulated through assessment practices. Evaluation determines the extent to which Program Educational Objectives or Program Outcomes are being achieved, and results in decisions and actions to improve the program.
- (g) **Mapping** – Mapping is the process of representing, preferably in matrix form, the correlation among the parameters. It may be done for one to many, many to one, and many to many parameters.

(h) **Rubrics:** Rubrics provide a powerful tool for assessment and grading of student work. They can also serve as a transparent and inspiring guide to learning. Rubrics are scoring, or grading tool used to measure a students' performance and learning across a set of criteria and objectives. Rubrics communicate to students (and to other markers) your expectations in the assessment, and what you consider important.

3.2. Program Outcomes (POs) and Program-Specific Outcomes (PSOs)

3.2.1. Program Outcomes (POs)

POs are statements that describe what students are expected to know and be able to do upon graduating from the program. These relate to the skills, knowledge, analytical ability attitude and behaviour that students acquire through the program.

The POs essentially indicate what the students can do from subject-wise knowledge acquired by them during the program. As such, POs define the professional profile of an engineering graduate.

NBA has defined the following twelve POs for an engineering graduate. These are inline with the Graduate Attributes as defined by the Washington Accord:

- i) **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- ii) **Problem Analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- iii) **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 the public health and safety, and the cultural, societal, and environmental considerations.
- iv) **Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems:
 - ☞ that cannot be solved by straightforward application of knowledge, theories and techniques applicable to the engineering discipline as against problems given at the end of chapters in a typical text book that can be solved using simple engineering theories and techniques;
 - ☞ that may not have a unique solution. For example, a design problem can be solved in many ways and lead to multiple possible solutions;
 - ☞ that require consideration of appropriate constraints / requirements not explicitly given in the problem statement such as cost, power requirement, durability, product life, etc.;
 - ☞ which need to be defined (modelled) within appropriate mathematical framework; and

☞ that often require use of modern computational concepts and tools, for example, in the design of an antenna or a DSP filter.

- v) **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- vi) **The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- vii) **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- viii) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- ix) **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- x) **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- xi) **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- xii) **Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

3.2.2. Program Specific Outcomes (PSOs)

PSOs are a statement that describes what students are expected to know and be able to do in a specialized area of discipline upon graduation from a program. Program may specify 2-4 program specific outcomes, if required. These are the statements, which are specific to the particular program. They are beyond POs. Program Curriculum and other activities during the program must help in the achievement of PSOs along with Pos.

3.2.3 Program-Specific Criteria

The Program-Specific Criteria deals with the requirements for engineering practice particular to the related sub-discipline. The stipulations in the Program-Specific Criteria chiefly concern curricular issues and

competencies / qualifications of faculty. UG engineering program can adopt the Program-Specific Criteria specified by appropriate International Professional Associations such as ASME, ASCE, ACM, IEEE, etc.

3.3 Accreditation Criteria

3.3.1 Criterion 1- Vision, Mission and Program Educational Objectives (PEOs)

Each engineering program to be accredited or re-accredited should have its published Vision, Mission and Educational Objectives. Vision and Mission statements help the program in defining aspirations and to remain focused. These statements should be written in a simple language, easy to communicate and should define objectives which focus on aspirations of near future of the institution. Vision is a futuristic statement that the institution would like to achieve over a long period of time, and Mission is the means by which it proposes to move toward the stated Vision.

The Program Educational Objectives of an engineering degree program are the statements that describe what the graduates are expected to perform and achieve during the first few years after graduation. The PEOs, may be guided by global and local needs, vision of the institution, long term goal, etc. The list of various stakeholders of the program, who have been involved in the process of defining the PEOs, are to be provided. While framing the PEOs, the following factors are to be considered:

- ☞ PEOs should generally reflect on the professional accomplishments, continuing education and attitudes in the first few years after their graduation.
- ☞ The PEOs should be consistent with the mission of the institution.
- ☞ All the stakeholders should participate in the process of framing PEOs.
- ☞ The number of PEOs should be manageable.
- ☞ It should be based on the needs of the stakeholders.

For example, the PEOs of an academic program might read like this:

PEO1: Practice civil engineering in construction industry, public sector undertaking or as an entrepreneur for successful professional career.

PEO2: Pursue higher education for professional development.

PEO3: Exhibit leadership qualities with demonstrable attributes in lifelong learning to contribute to the societal needs.

The program shall provide how and where the department's Vision and Mission and the PEOs have been published and disseminated. It should also describe the process of establishing the Vision, Mission and PEOs of the program as per the details provided in the SAR. The program shall also demonstrate how the PEOs are aligned with the Mission of the department/institution.

3.3.2 Criterion 2- Program Curriculum and Teaching-Learning Processes

Program should describe the process that periodically documents and demonstrates how the program curriculum is evolved considering the Program Outcomes and Program-Specific Outcomes. The structure of the curriculum shall comprise of course code, course title, total number of contact hours (lecture, tutorial and practical) and credits. Program curriculum grouping based on course components such as core, elective, basic science, engineering science, humanities and projects / internship shall also be indicated. The process to identify the extent of compliance of the curriculum for attaining the Program Outcomes (POs) and Program-Specific Outcomes (PSOs) shall be articulated.

Program should include methods followed to improve quality of teaching and learning processes which may include adherence to academic calendar and improving instruction methods using pedagogical initiatives such as real world examples, collaborative learning, quality of laboratory experience with regard to conducting experiments, recording observations, analysis of data, etc. encouraging bright students, assisting weak students, etc. It is also required to mention the initiatives, implementation details and analysis of learning levels related to quality of semester tests, assignments and evaluation, steps taken to ascertain the quality of the projects in terms of processes related to project identification, allotment, continuous monitoring, evaluation including demonstration of working prototypes and enhancing the relevance of projects. Implementation details including details of POs and PSOs addressed through the projects with justification are also required to be provided.

Program should describe about the initiatives related to industry interaction in terms of industry-attached laboratories, partial delivery of appropriate courses by industry experts, initiatives related to industry internship/summer training, etc.

The initiatives, implementation details and impact analysis for various parameters as per the format are to be provided in SAR.

3.3.3 Criterion 3- Course Outcomes and Program Outcomes

Precise illustrations of program articulation matrix and course articulation matrix, modes of delivery of the courses, how assessment tools are used to assess the impact of course delivery / course content, and how laboratory and project work are contributing towards the attainment of the COs and POs, shall be clearly outlined in the program.

The attainment of POs may be assessed by direct and indirect methods. Direct methods of assessment are essentially accomplished by the direct examination or observation of students' knowledge or skills against measurable performance indicators. On the other hand, indirect methods of assessment are based on ascertaining opinion or self-report. Rubric is a useful tool for indirect assessment. A rubric basically articulates the expectations for students' performance. It is a set of criteria for assessing students' work or performance. Rubric is particularly suited to Program Outcomes that are complex or not easily quantifiable for which there are no clear "right" or "wrong" answers or which are not evaluated with the standardized tests or surveys. For

example, assessment of writing, oral communication, or critical thinking often require rubrics. The development of different rubrics and the achievement of the outcomes need to be clearly stated in the SAR. The results of assessment of each PO for two to three assessment years shall be indicated as they play a vital role in implementing the continuous improvement process of the program.

3.3.4 Criterion 4 - Students' Performance

The educational institution should monitor the academic performance of its students carefully. The institution shall provide the required information for three complete academic years about sanctioned intake and corresponding admission in the program, success rate with and without backlogs in the stipulated period, academic performance of second and third year, placement and higher studies and professional activities as per the format given in the SAR.

3.3.5 Criterion 5 - Faculty Information and Contributions

The faculty members should possess adequate knowledge / expertise to deliver all the curricular contents of the program.

The number of faculty members must be adequate so as to enable them to engage in activities outside their teaching duties, especially for the purposes of professional development, curriculum development, student mentoring/counselling, administrative work, training, and placement of students, interaction with industrial and professional practitioners.

The number of faculty members must be sufficiently large in proportion to the number of students, so as to provide adequate levels of faculty-student interaction. In any educational program, it is essential to have adequate levels of faculty-student interaction, which is possible only if there are enough faculty members.

The faculty must be actively involved in research and development. The program must support, encourage and maintain such R&D activities, which, in turn, provide new knowledge to the curriculum. The student's education is enriched by being part of such a culture as it cultivates skills and habits for lifelong learning and knowledge on contemporary issues.

The program shall provide the required information for three complete academic years for Student-Faculty Ratio (SFR), Faculty Cadre Ratio, Faculty Qualifications, Faculty Retention, Faculty competencies in correlation to program-specific criteria, Innovations by the faculty in teaching and learning, Faculty development activities, academic research, sponsored research, development activities and consultancy along with Faculty Performance Appraisal and Development System (FPADS) and contributions of visiting / adjunct / emeritus faculty as per the format given in the SAR.

3.3.6 Criterion 6 - Facilities and Technical Support

The institution must provide adequate infrastructural facilities to support the achievement of the Program Outcomes. Classrooms, tutorial rooms, meeting rooms, seminar halls, conference hall, faculty rooms, and laboratories must be adequately furnished to provide an environment conducive to learning.

The laboratories must be equipped with computing resources, equipment, and tools relevant to the program. The equipment of the laboratories should be properly maintained, upgraded and utilized so that the students can attain the Program Outcomes. There should be an adequate number of qualified technical supporting staff to provide appropriate guidance to the students for using the equipment, tools, computers, and laboratories. The institution must provide scope for the technical staff for upgrading their skills and professional advancement.

The institution shall provide the required information about adequacy and equipment in the laboratories, their maintenance, overall ambience and safety measures in laboratories in the department to meet the curriculum requirements as well as the POs and PSOs, and technical manpower in the department, as per the format given in the SAR.

3.3.7 Criterion 7-Continuous Improvement

Closing the loop at course level, program level and institution level ensures quality assurance of the program. All COs attainment and POs attainment analysis is made to provide continuous improvement through course delivery, assessment and curriculum.

The institution shall provide required information regarding action taken based on the results of evaluation of each PO for two to three assessment years along with academic audit system / process, placement, higher studies, entrepreneurship and quality of students admitted to the program in relation to continuous improvement.

3.3.8 Criterion 8 –First Year Academics

First year of graduation study consists of science, mathematics, humanities and general engineering courses from different departments of the institution. Institution has to provide information about First Year Faculty Ratio (FYSFR), Qualification of Faculty Teaching First Year Common Courses, First Year Academic Performance, Attainment of Course Outcomes and Program Outcomes of all first year courses and the action taken based on the results of evaluation of relevant POs and PSOs for continuous improvement.

3.3.9 Criterion 9 –Student Support Systems

Academic student support systems play an important role in the teaching-learning process. Institutions are expected to provide information on the various such systems namely, mentoring/proctor system at individual level, feedback analysis and reward and corrective measures, self-learning facilities/materials and scope for learning beyond syllabus, career guidance, training and placement, details of activities of entrepreneurship cell, and provision for co-curricular and extra-curricular activities as per the format given in SAR.

3.3.10 Criterion 10 - Governance, Institutional Support and Financial Resources

The governance structure of the program must clearly assign authority and responsibility for the formulation and implementation of policies that enable the institution to fulfil its Mission and in turn Vision of the institution. The institution must possess the financial resources necessary to fulfil its Mission and PEOs. In particular, there must be sufficient resources to attract and retain well-qualified staff, and to provide them with opportunities for continuous development and career growth. The program's budgetary planning process must also be provided for the acquisition, repair, maintenance and replacement of physical facilities and equipment.

The educational institution must have a comprehensive and up-to-date library and extensive educational, technological facilities.

The institution shall provide the required information about strategic plan and its effective implementation and monitoring, governance body, administrative setup, function of various bodies, service rules and recruitment policies, decentralization in working and grievance redressal mechanism, delegation of financial powers, transparency and availability of correct information in public domain, budget allocation and utilization (for both institution and program), library, quality of learning resources and availability of adequate Internet bandwidth as per the format given in the SAR.

3.4 Accreditation Criteria Marks Distribution

Criterion No.	Criteria	Mark / Weightage
	Program Level Criteria	
1.	Vision, Mission and Program Educational Objectives	50
2.	Program Curriculum and Teaching – Learning Processes	100
3.	Course Outcomes and Program Outcomes	175
4.	Students' Performance	100
5.	Faculty Information and Contributions	200
6.	Facilities and Technical Support	80
7.	Continuous Improvement	75
	Institution Level Criteria	
8.	First Year Academics	50
9.	Student Support Systems	50
10.	Governance, Institutional Support and Financial Resources	120
	Total	1000

PART - IV

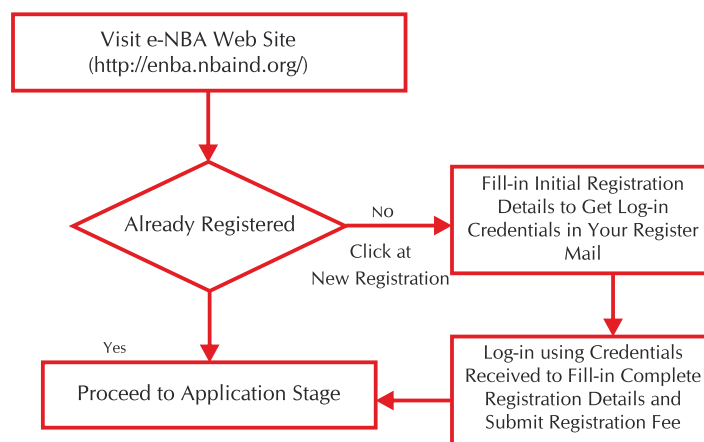
4. Accreditation Process

Accreditation workflow for Tier I Engineering institution is summarized in Workflow Diagram (Fig. 1) and described below briefly:

4.1 Accreditation Stages

Eligible institutions may apply for accreditation of their programs online through the “Accreditation Workflow Management System” (<https://enba.nbaind.org/>) called e-NBA. The process of accreditation can be grouped into the following four sequential stages essentially in the same order. These stages are: i) Initial Stage; ii) Pre-Assessment Stage; iii) Assessment Stage; and iv) Post Assessment Stage (Decision-Making). Applicant institution must complete the previous stage, before proceeding to the next stage.

Initial Stage: Registration



Pre-Assessment Stage

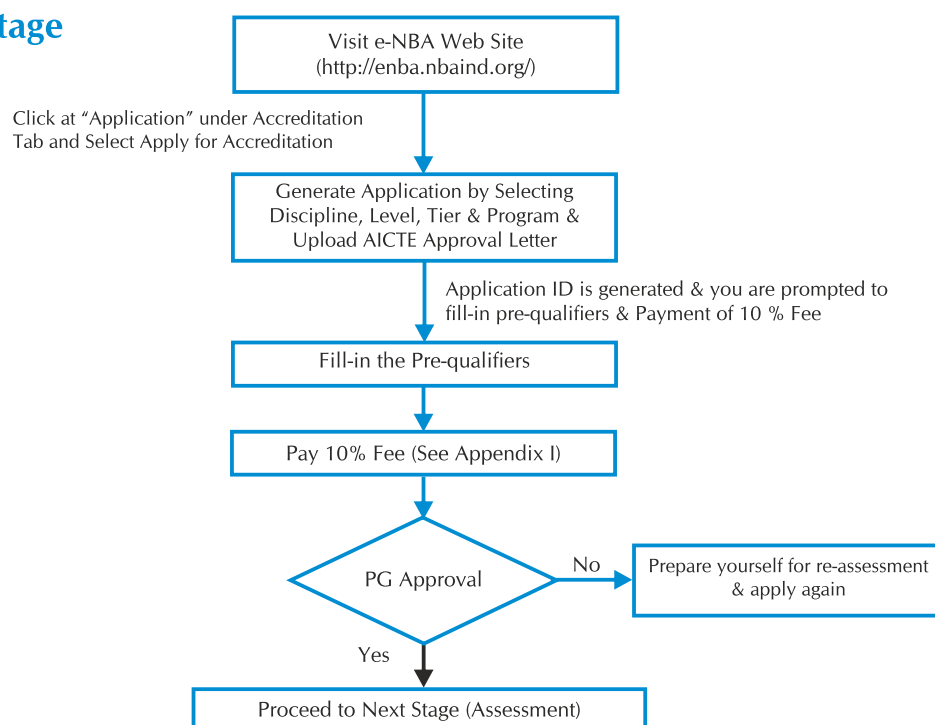
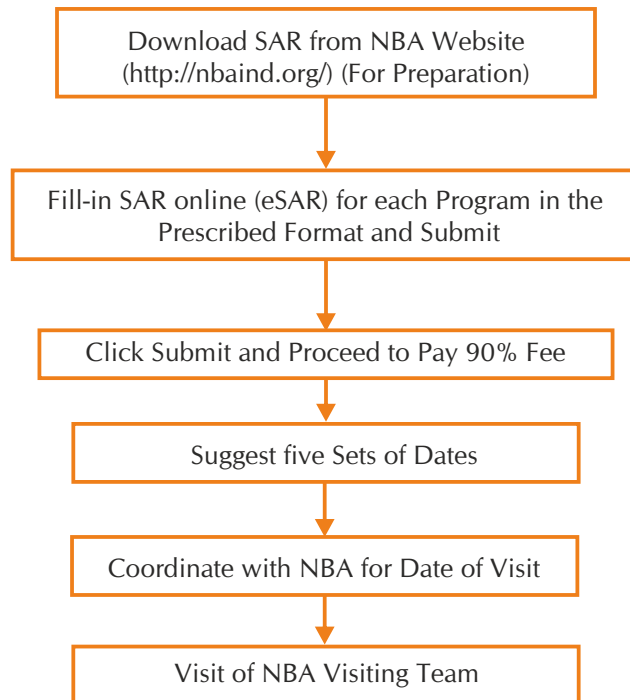


Fig. 1: Accreditation Workflow: Registration and Pre-assessment Stage

Assessment Stage



Post-Assessment Stage

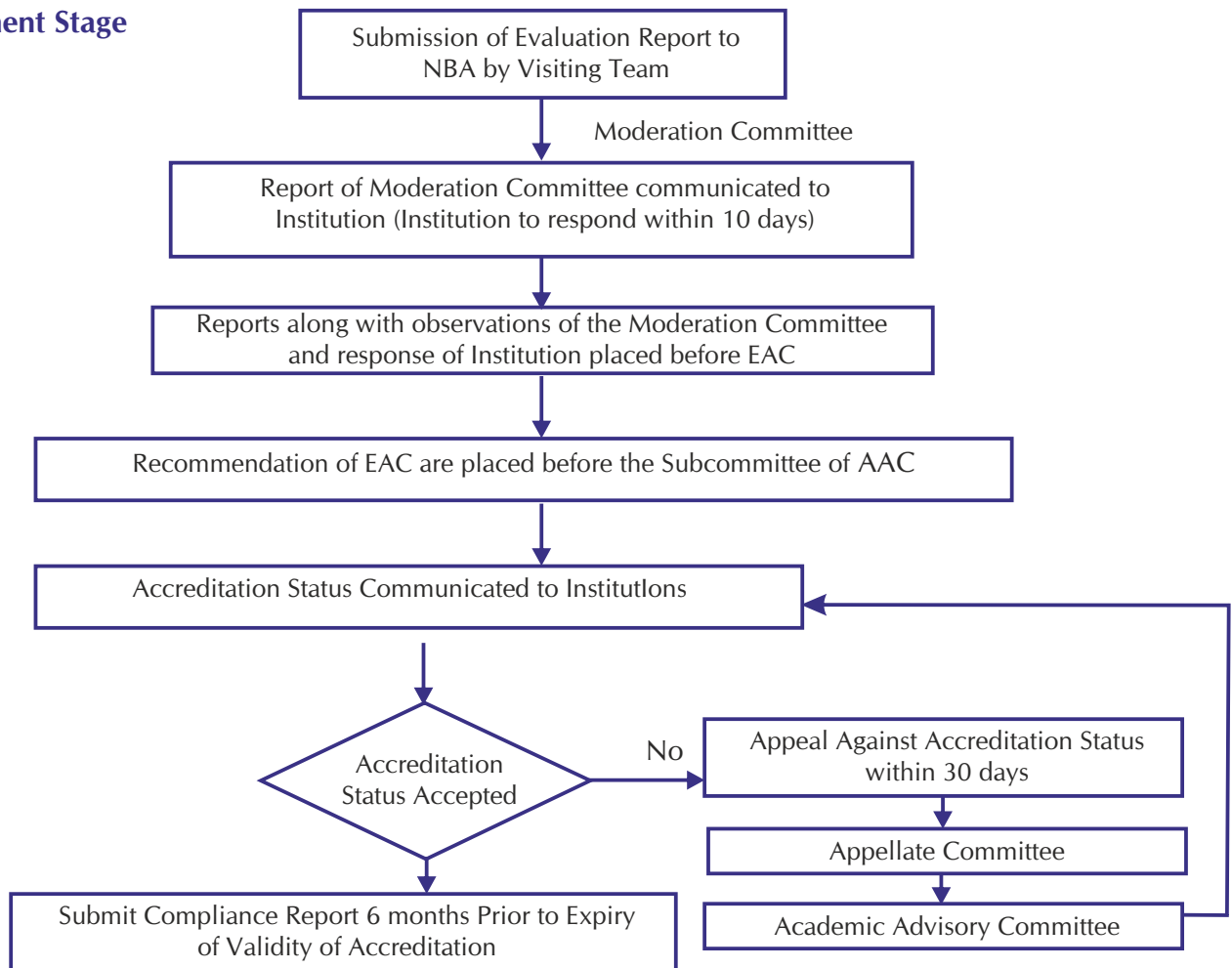


Fig. 1: Accreditation Workflow: Assessment and Post-Assessment Stage

4.1.1. Initial Stage: Registration

Institutions willing to seek accreditation of their programs by NBA are required to register with eNBA. Registration with eNBA is a one-time process. After filing the initial registration form, user gets user-id and password to fill-in the complete Registration Form. Fig.2 is screen shot of initial registration and login interface for registered institutions.

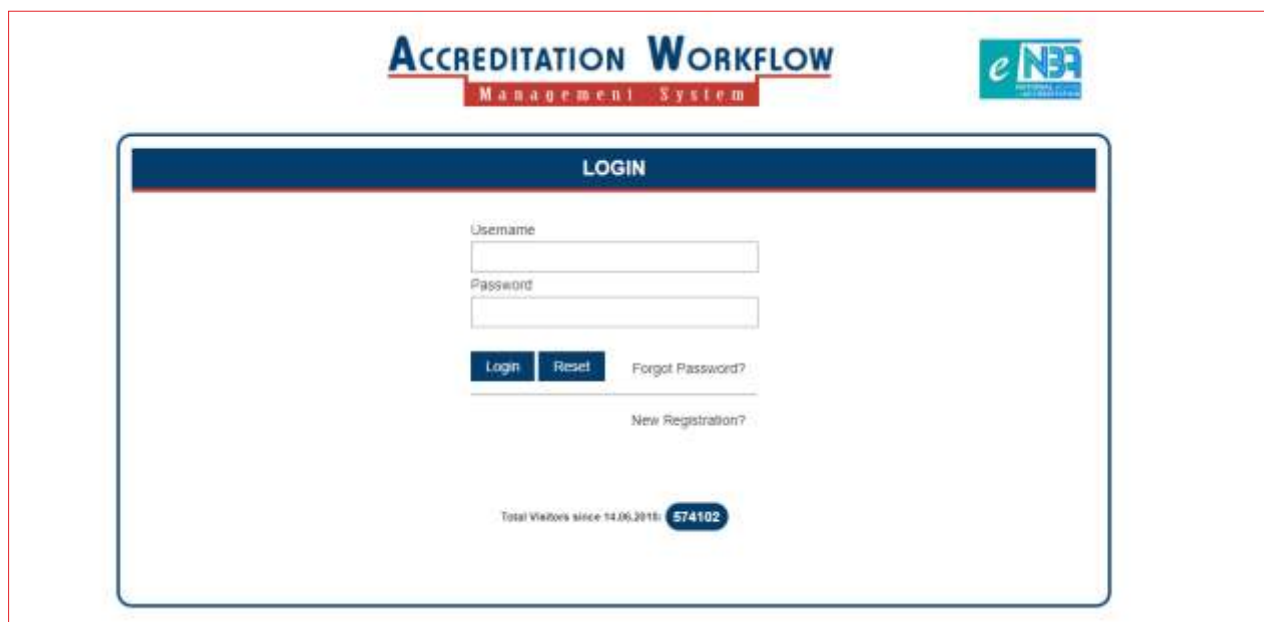


Fig. 2: Registration of Institutions on e-NBA

Steps involved in the process of registration are as follows:

- ☞ The process of registration involves filling-in and submission of basic information of the registering institution in the data input boxes on e-NBA Registration Interface. On submission of basic information, the institution receives temporary login credentials through their registered e-mail, which become permanent user ID after submission of one-time Registration Fee (**See Annexure I: Fee Structure**).
- ☞ The institution is required to login using credentials received through their registered e-mail to complete the process of registration which includes keying-in of information in the data input boxes on e-NBA portal, such as the head of the institution, details of key promoters, bank details, details of the programs proposed for accreditation by the institution and uploading copies of all AICTE Approval Letters (academic year wise) or any other appropriate regulatory authority. The copies should be duly authenticated by the Head of the institution on each page.
- ☞ The institution is required to pay one-time registration fee to complete the process of registration.
- ☞ The above-mentioned process should be completed within **15 working days** of the initiation of the registration, failing which institutions will have to register again.
- ☞ Institutions already registered with e-NBA are not required to start the process of registration again.

4.1.2. Pre-Assessment Stage

4.1.2.1. Application for Accreditation

- ☞ Registered institution may apply online for accreditation of its programs by NBA. Login into eNBA portal using login credentials obtained during the Registration process mentioned above.
- ☞ Generate appropriate format for application by selecting Discipline, Level and Programs from pull-down menus as shown in Fig. 3.

Application Form For Accreditation Add AICTE Letter

Programme(s) for Accreditation

Application Date: 12-06-2018

	Engg. & Tech./Pharmacy	Management	Computer Application
Discipline *	Select Discipline *	Select Discipline *	Select Discipline *
Level *	Select Level *	Select Level *	Select Level *
Tier *	Select *	None *	Select *
Programme *	Select Programme *	Select Programme *	Select Programme *
	Add To List	Add To List	Add To List

Note: Guidelines for Filling Application Form:

1) The Institutes can apply maximum for 5 programmes in a single application for various levels. However, MBA and MCA Programmes may be included alongwith Engineering Programmes in an application.

2) Upload all AICTE approval letters till date.

Fig. 3: Generating Application(s) for Accreditation of Specific Program

- ☞ Upload all AICTE Approval Letters for the last five years including the Current Academic Year or any other appropriate regulatory authority duly authenticated by the Head of the institution.
- ☞ Institutions can apply for accreditation up to five programs through a single application on the e-NBA portal. Management and MCA programs can be clubbed with other programs in a single application. Applications for accreditation can be submitted any time when an institution is fairly confident that its programs comply with the relevant pre-qualifiers, and their system for outcome-based education and accreditation have been put in place and well imbibed by the faculty members of the program.
- ☞ Click at **“Submit”** button, for submission of temporary application to NBA for further processing. Application ID gets generated on successful submission of application.

4.1.2.2. Submission of Pre-Qualifiers

After the generation of the temporary application, the institution is required to fill-in the pre-qualifiers (See Annexure II) for program(s) to be accredited through eNBA portal. Login into eNBA portal and Click at “Pre-qualifier / e-SAR” under “Application” from the Left Navigation Panel. eNBA would display your Application No., Program and Level. Click at “Proceed to Pre-qualifiers”. e-NBA seeks information on pre-qualifiers under five sub-heads, namely i) Programme-specific Information; ii) Student Admissions; iii) Information on Faculty;

iv) Student Faculty Ratio; and v) Compliance Status. Fill-in all the requisite information for the first sub-head and click at “Save and Next” to move to the next sub-head. Screenshot of program-specific information is given below as an example in **Fig. 4**.

Program Specific Information for Civil Engg.

Note: Please provide details of all the programs offered by the department.
 Note: Please click on Add more before clicking at Save and Next.

Name of Department:

Name of the Program: Program for Consideration: Level:

Year of Start: Year of AICTE Approval: Initial Intake:

Increase / Decrease in Intake(Yes/No): Current Intake: Accreditation Status:

Name of program	Program Applied Level	Start of Year	Year of AICTE Approval	Initial Intake	Intake Increase	Current Intake	Accreditation Status	From	To	Program For Consideration	Duration	Delete
												<input type="button" value="X"/>

Fig.4: Screenshot of Pre-qualifier: Program-Specific Information

4.1.2.3. Submission of 10 % of Total Accreditation Fee

The institution is required to submit 10 per cent of the total applicable accreditation fee (as prompted by eNBA portal) (see Annexure I: Fee Structure) along with duly filled-in pre-qualifiers for further processing of the application. This first stage fee is non-refundable. If all the pre-qualifiers applied through an application are not approved, then the application is not processed further and the institution is informed accordingly.

All pre-assessment steps mentioned-above (4.1.2.1 to 4.1.2.3) should be completed within 30 days from the generation of the temporary application. If all these steps are not completed within 30 days, the application needs to be regenerated and PQs needs to be filled again.

4.1.3. Assessment Stage

4.1.3.1. Submission of Self-Assessment Report (SAR)

Submission of Self-Assessment Report (SAR) and Assessment by Visiting Team of NBA involves the following steps:

- ☞ Once the Pre-Qualifiers are approved, the institution is required to fill-in the e-SARs for the programs whose pre-qualifiers are approved as prompted by eNBA portal.
- ☞ To fill-in e-SAR (See Annexure III - SAR), login into eNBA portal, click at “PQ/e-SAR” under “Application” and start filling the e-SAR online for each program. The information filled in Pre-Qualifier come prefilled (such as student information and faculty details) in the e-SAR and institutions are required to fill rest of the information. The e-SAR contains more detailed information about the programs and helps the institution to

self-assess itself on each accreditation criteria. It is an opportunity for the institution to showcase its strengths, weaknesses, etc. for evaluation and assessment criteria of NBA. However, e-SAR is expected to be factual and not narrative. Screenshot of the Index Page of eSAR is given below as an example in Fig. 5.

SELF ASSESSMENT REPORT FOR Biomedical Engg.

Instructions -

- For filling SAR please use Mozilla firefox.
- Charts are acceptable from Microsoft Excel only.

[Instructions to fill SAR.](#)

Part A: Institutional Information

Institution Details

Student & Faculty Details

Contact Details

Part B: Program Information

Program Level Criteria

Institute Level Criteria

Part C: Declaration by the Institution

Declarations

Annexure I

Program Outcomes

Fig.5: Screenshot of eSAR: Index Page

- ☞ Once all e-SAR of individual programs are submitted, click on the final submit button and pay the remaining 90% fees for all the programs whose e-SAR has been submitted (See Annexure I – Fee Structure). Institution can view the submitted e-SAR online and save it as PDF. The e-SAR submitted online is automatically forwarded to NBA for further necessary action.
- ☞ On submission of e-SAR, institution is invited to suggest dates for the visit and prepare itself for the visit as shown in Fig. 6. Submit five sets of dates for the visit. The institution is required to propose such sets of dates for the visit when the regular classes and all academic activities of the program applied for accreditation are on. NBA selects one set of dates and communicates the same to the institution. After receiving the concurrence of the institution, the dates of visit are fixed, and Visiting Team of NBA conducts the visit.

Application Detail

Application Number:

Proposed Set of Visit Dates for Expert Visit to the Institution

	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
From	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
To	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Fig. 6: Propose Five Sets of Dates for Visiting Team

4.1.3.2. Visiting Team to the Institution for Accreditation

- ☞ Once the Institution confirms the visit date, NBA constitutes the visit team. An accreditation visit to the institution is held for 3 days. However, visit for a single program is held for 2 days. This excludes the pre-visit meeting, which is held on day 0 at the place of stay. The Visiting Team consists of a Chairperson and two Program Evaluators for each program.
- ☞ While constituting a Visiting Team, NBA checks for the conflict of interest, i.e., expert must not be from the same State as of the institution and should not have any professional relation with the institution and/or program. Declaration and Feedback taken from the Chairperson and Evaluators is enclosed as Part C of Annexure IX and X respectively.
- ☞ The complete evaluation process including composition of Visiting Team, criteria for nomination, general policies for team formation, etc. have been elaborated in Part III of General Manual available at <http://www.nbaind.org/files/general-manual-of-accreditation.pdf>.
- ☞ The following Evaluation Documents that are helpful to the Visiting Team in preparing themselves for the visit as well as guiding them on processes and procedures to be followed are annexed in this Manual:
 - ✓ Pre-visit Preparation for Chairperson (Annexure IV)
 - ✓ Pre-visit Evaluation Report for Evaluator (Annexure V)
 - ✓ Visit Schedule (Annexure VI)
 - ✓ List of Documents to be Verified during the Visit (Annexure VII)
 - ✓ Evaluation Guidelines (Annexure VIII)
 - ✓ Chairperson's Visit Report (Part A, B and C) (Annexure IX)
 - ✓ Evaluator's Visit Report (Part A, B and C) (Annexure X)
 - ✓ Certificate of Participation (to be filled-in by the Chairperson of the Visiting Team) (Annexure XI)
 - ✓ Certificate and Feedback to be filled-in by the Institution (Annexure XII, XIII)

4.1.3.3. Accreditation Visit

The visit of the Evaluation Team is arranged to the institution seeking accreditation of its program(s) to evaluate and validate the assessment of the institution/department through the SAR of the program concerned as per specified accreditation criteria. Although it may not be possible to describe adequately all the factors to be assessed during the on-site visit, some of the common ones are the following:

- i) Outcomes of the education provided;
- ii) Quality assurance processes; including internal reviews;
- iii) Assessment;

- iv) Activities and work of the students;
- v) Entry standards and selection for admission of students;
- vi) Motivation and enthusiasm of faculty;
- vii) Qualifications and activities of faculty members;
- viii) Infrastructure facilities;
- ix) Laboratory facilities;
- x) Library facilities;
- xi) Industry participation;
- xii) Organization.

In order to assist the Evaluation Team in its assessment, the educational institution should arrange for the following:

A) Meeting with:

- a. The Head of the Institution/Dean/Heads of Department (HoD)/Program and Course Coordinators;
- b. Member(s) of the management (to discuss how the program fits into overall strategic direction and focus of the institution, and management support for continued funding and development of the program);
- c. Faculty members;
- d. Alumni;
- e. Employers;
- f. Students; and
- g. Parents.

B) Availability of the following Exhibits:

- a. Profile of faculty involved in the program;
- b. Evidence that the results of assessment of course outcomes and program outcomes are being applied to the review and ongoing improvement of program effectiveness;
- c. List of publications, consultancy and sponsored/funded research projects by the program faculty;
- d. Sample materials for theory and laboratory courses;
- e. Sample test/semester examination question papers for all courses;
- f. Sample of test/semester examination answer scripts projects, assignments, (including at least one excellent, one good and one marginal pass for each examination) question papers and evidences related to assessment tools for COs and POs;

- g. Student records of three immediate batches of graduates;
- h. Sample project and design reports (excellent, good and marginal pass) by students;
- i. Sample student Feedback Form;
- j. Sample for industry-institution interaction;
- k. Results of quality assurance reviews;
- l. Records of employment/higher studies of graduates;
- m. Records of academic support and other learning activities; and
- n. Any other document that the Evaluation Team/NBA may require.

A) Visit to:

- a. Classrooms;
- b. Laboratories pertaining to the program;
- c. Central and department library; and
- d. Computer Centre.

The Visiting Team should conduct an Exit Meeting with the Management Representative, the Head of the Institution, the Head of Department and other key officials at the end of the on-site visit to present its findings (strengths, concerns, weaknesses and deficiencies). The institution is given a chance to withdraw one or more programs from the process of accreditation. In this case, the Head of the Institution shall have to submit the withdrawal in writing to the Chairperson of the Visiting Team during the Exit Meeting. No request for withdrawal shall be accepted after the exit meeting.

4.1.3.4. 360 Degree Feedback

Appraisal 360° works by gathering the opinions of a number of people. A series of carefully structured questions prompt one to assess skills in a number of key areas. A number of other people are then asked to give their perception by answering a set of questions, which are then compiled into a feedback report. It is envisaged that such feedback will help in bringing transparency and objectivity in the evaluation process which will help in improving quality of the accreditation process, the cherished goal of all the stakeholders.

The 360° Feedback Forms are made available online to the Institutions, Chairperson and the Evaluators by NBA. They have the flexibility to either fill-in the form online or download the form and submit the same by mail within 3 days.

- A. Feedback Form Filled-in by the Head of the Institution: This format mainly focuses on the feedback on the entire Visiting Team comprising the Chairperson and Evaluators regarding the accreditation and evaluation process and seeking comments about the general behavior of the Visiting Team.
- B. Feedback Form Filled-in by the Chairperson: This format mainly focuses on the feedback on the performance of the evaluators and also about the cooperation and coordination rendered by the institution at the time of accreditation visit.

- C. Feedback Form Filled-in by the Evaluators: This format mainly focuses on the feedback on the Chairperson, Co-evaluators and also about the cooperation and coordination rendered by the institution at the time of accreditation visit.
- D. Feedback form Filled-in by the Chairperson / Evaluators in respect of Service Provider: This format mainly focuses on the feedback on the performance of the service providers during the visit of accreditation.

4.1.4. Post-Assessment Stage

4.1.4.1. Processing of Evaluation Report

Processing of Evaluation Report submitted by the Visiting Team involves the following steps:

- ☞ Once the accreditation visit is completed, the experts prepare the evaluation report and submit it to the NBA.
- ☞ The report is first placed before the Moderation Committee. The Moderation Committee considers the Evaluation Report and find out the borderline cases. The observations of the Moderation Committee, for such cases are communicated to the institution for seeking necessary clarification within 10 days of submission of evaluation report. Response of the institution is sent to Chairperson of the Visiting Team.
- ☞ The Visiting Team Report, observations of Moderation Committee and the response of the institution are considered by the EEAC (Engineering Evaluation and Accreditation Committee) in the presence of Chairperson of the Visiting Team.
- ☞ The recommendations of the EEAC are considered by the concerned Sub Committee of AAC of Engineering for taking a final decision on accreditation status. The final status of accreditation, as per the decision of Sub-committee of AAC, is communicated to the institution by NBA.

4.2 Award of Accreditation

- i) Accreditation of the Program for Six years;
- ii) Accreditation of the Program for Three years; and
- iii) No Accreditation of the Program.

Engineering institutions in Tier I category are given grades, instead of marks, which are denoted with Y (for Yes, equivalent to 75 per cent and above marks), C (for Concern, equivalent to below 75 per cent and upto 60 per cent marks), W (for Weakness, equivalent to below 60 per cent and upto 40 per cent marks) and D (for Deficiency, equivalent to below 40 per cent marks).

Y = 75% & Above; C = 60% and < 75%; W = 40% and < 60%; D < 40%.

The accreditation is awarded based on the fulfilment of the following requirements:

4.2.1 Award of Accreditation for Six Years

Y	C	W	D
≥ 7	≤ 3	0	0

- ☞ There should not be any “Deficiency” or “Weakness” in any of the criteria and at least seven criteria must be fully compliant with only “Concerns” in the remaining criteria.
- ☞ Number of available Ph.D. in the department should be greater than or equal to 30 per cent of the required number of faculty averaged over two academic years i.e. Current Academic Year (CAY) and Current Academic Year Minus One (CAYM1).
- ☞ The admissions in the UG program under consideration should be more than or equal to 75 per cent and admissions at the overall institutional level should be more than or equal to 60 per cent, averaged over three academic years i.e. Current Academic Year (CAY), Current Academic Year Minus One (CAYM1) and Current Academic Year Minus Two (CAYM2).
- ☞ Faculty Student Ratio in the department should be less than or equal to 1:15 averaged over three academic years i.e. Current Academic Year (CAY), Current Academic Year Minus One (CAYM1) and Current Academic Year Minus Two (CAYM2).
- ☞ At least 2 Professors or 1 Professor and 1 Associate Professor (on regular basis) with Ph.D. degree should be available in the respective department for two academic years i.e. Current Academic Year (CAY) and Current Academic Year Minus One (CAYM1).
- ☞ HoD of the program under consideration should possess Ph.D. degree in the Current Academic Year (CAY)

4.2.2 Award of Accreditation for Three Years

Y	D
≥ 4	≤ 2

- ☞ At least four criteria must be fully compliant and remaining two criteria with deficiency.
- ☞ The admissions in the UG program under consideration should be more than or equal to 60 per cent and admissions at the overall institutional level should be more than or equal to 60 per cent, averaged over three academic years i.e. Current Academic Year (CAY), Current Academic Year Minus One (CAYM1) and Current Academic Year Minus Two (CAYM2).
- ☞ At least 2 Professors or 1 Professor and 1 Associate Professor (on regular basis) with Ph.D. degree should be available in the respective department for two academic years i.e. Current Academic Year (CAY) and Current Academic Year Minus One (CAYM1).

- ☞ The faculty student ratio in the department under consideration should be less than or equal to 1:25 averaged over three academic years i.e. Current Academic Year (CAY) , Current Academic Year Minus One (CAYM1) and Current Academic Year Minus Two (CAYM2).
- ☞ Number of available Ph.D. in the department should be greater than or equal to 20 per cent of the required number of faculty averaged over two academic years i.e. Current Academic Year (CAY) and Current Academic Year Minus One (CAYM1).
- ☞ HoD of the program under consideration should possess Ph.D. degree in the Current Academic Year (CAY).
- ☞ In case of a “D” in Criterion – V (Faculty Information & Contributions), the program is not considered for accreditation.

4.2.3 No Accreditation of the Programs

- ☞ If the program fails to meet the criteria for award of accreditation for three years, it is awarded “Not Accredited” status.

4.3 Appeal

If the institution is not satisfied with the NBA’s decision on the Status of Accreditation, then the institution can make an appeal against the decision within 30 days of date of receipt of communication from NBA along with the fee given in Annexure I: Fee Structure. The appeal is placed before the Appellate Committee in which the institutions are invited to present their case before the Committee. The recommendations of Appellate Committee are considered by the Academic Advisory Committee (AAC) for taking decision on appeal.

4.4 Continuation of Accreditation

Institutions that have already been granted accreditation for a period of three years, are required to submit the Compliance Report at least 6 months before the expiry of validity of accreditation along with the compliance fee.

On receipt of Compliance Report, a two-member Visiting Team of experts is constituted by NBA for the visit of the institution. The report of the Visiting Team is considered by the concerned committees in NBA for continuation (or otherwise) of accreditation for an appropriate period.

4.5 Accreditation Fee

Any institution which applied for accreditation is required to pay the fee at various stages as per the details given in Annexure I: Fee Structure.

4.6 Reconsideration of Programs

If a program is 'not accredited' or withdrawn during the visit, a fresh application for accreditation of the same program can be considered after one year from the date of previous visit of the Visiting Team.

Note: For all other general information, please refer to the General Manual for Accreditation or contact NBA.

National Board of Accreditation

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