KIET Group of Institutions

OBE Manual with Bloom's Taxonomy

Patron In-Chief

Dr. (Col) A Garg (Director)

Patron

Dr. Manoj Goel (Joint Director)

Editorial Team

Chief Editor

Dr. Anil K. Ahlawat (Dean Academics)

Editor and Designer

Prof Yaduvir Singh (Asst Dean OBE)

Editorial Advisory Board

Dr. N C Shivaprakash, Professor, Indian Institute of Science Bangalore

Dr. S K Garg, Pro VC, Delhi Technological University

Dr. Onkar Singh, Professor, Harcourt Butler Technical University, Kanpur

Approved By

Dr. (Col) A Garg
(Director)

Dr. Anil K. Ahlawat
(Dean Academics)

KIET Group of Institutions

(Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Lucknow, Uttar Pradesh)

OBE Manual with Bloom's Taxonomy

(w.e.f:- 2018-19)

KIET Group of Institutions

OBE Manual with Bloom's Taxonomy

(To be Implemented w.e.f Academic Year 2018-19)

1. Introduction

Education plays a vital role in the development of any nation. NBA has been setup to help all participating Institutions assess their performance vis-à-vis set parameters. NBA accreditation is a quality assurance scheme for higher technical education. It is open to all Institutions in Engineering and Technology, Management, Architecture, Pharmacy, Hotel management and Catering Technology, Town and Country Planning, Applied Arts and Crafts in India which provide technical education to students. Accreditation is a process of quality assurance and improvement. Accreditation provides quality assurance that the academic aims and objectives of the Institution are honestly pursued and effectively achieved by the resources currently available, and that the Institution has demonstrated capabilities of ensuring effectiveness of the educational programme(s), over the validity period of accreditation.

1.1 Purposes of Accreditation: -

The purpose of the accreditation by NBA is to promote and recognize excellence in technical education in colleges and universities—at both the undergraduate and post graduate levels—through specialized accreditation. Institutions, students, employers, and the public at large all benefitted from the external verification of quality provided through the NBA accreditation process. They also benefited from the process of continuous quality improvement that is encouraged by the NBA's developmental approach to promoting excellence in technical education.

1.2 The Need of Accreditation: -

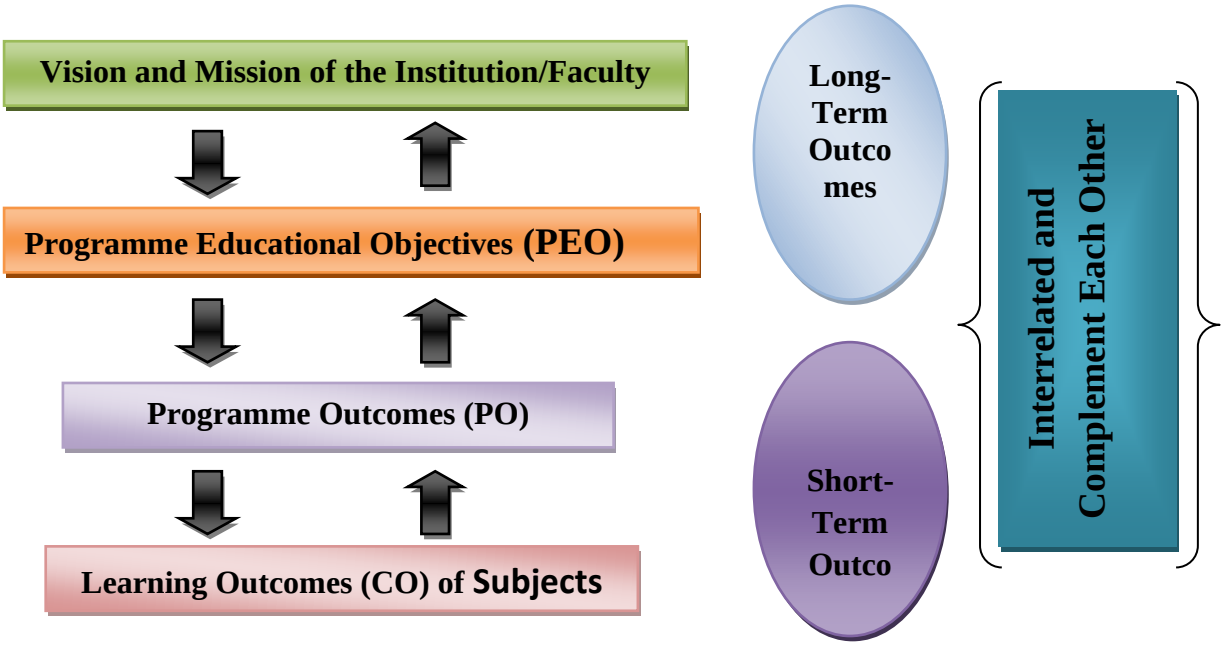
Accreditation of educational Institutions/programmes is a global practice and its need has been felt by various developing and developed countries for one or more of the following purposes. Funding decisions State recognition of qualification/ certification of professionals Accountability of Institutions to stakeholders Encouraging self-improvement initiatives by Institutions Quality assurance of educational programme Accreditation may be summarized as a process, based on professional judgment, for evaluating whether or not an educational Institution or programme meets specified standards of educational quality. Its primary purpose is to assure prospective students and public that graduates of an Institution, conducting various programmes, have achieved a minimum level of competence in their chosen fields of study, thus serving as a form of consumer protection. In many countries, accreditation is the legal responsibility of ministry of education or other governmental agencies.

1.3 Outcome Based Education:-

OBE is student centred instruction that focuses on measuring student performance on the basis of outcomes. Outcome based accreditation – focus remains on evaluation of outcomes of the program, though Input and Output parameters are also important. That means focus will have to be on Understanding fundamentals very well and learning new skills/competencies that would enable

individuals to cope with the demands of the rapidly changing workplace. Prepare global engineers who will have to solve problems and shoulder challenges which are not even known today!!

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 programme 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.



2. Vision, Mission& Quality Policy of KIET Group of Institutions

Vision

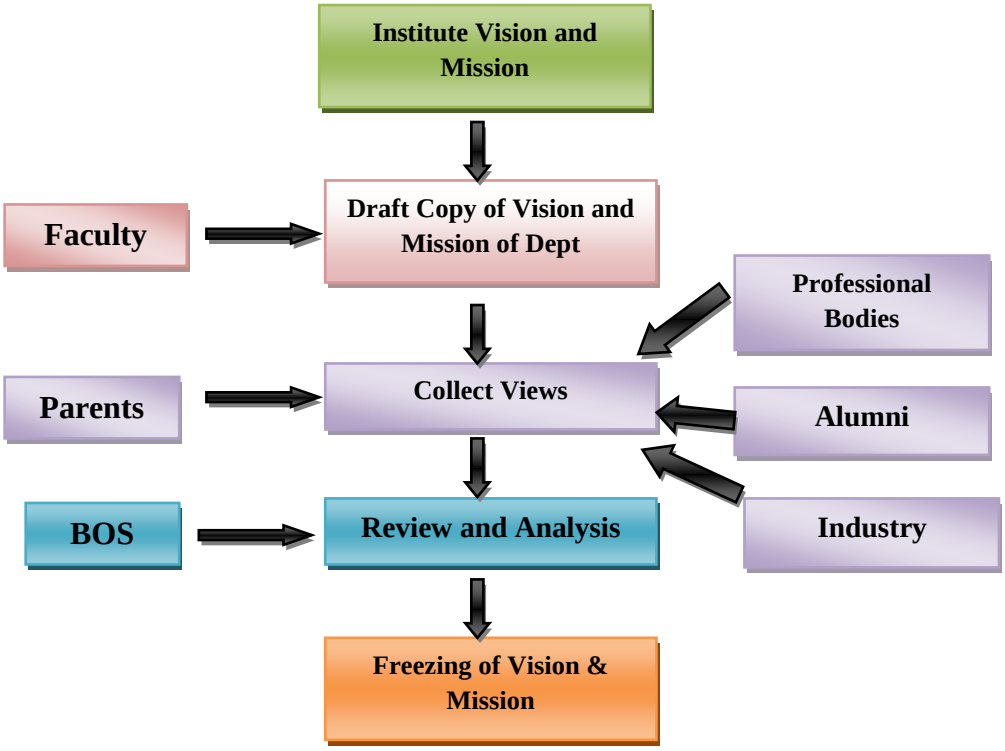
To achieve excellence in technical education and create competent professionals for industry & Socio-economic development to meet National and International Needs.

Mission

- To achieve academic excellence in technical education through innovative teaching-learning process.
- To provide strong fundamental & conceptual knowledge with essential skills to meet current & future needs.
- To build strong industry academia connects through industrial & socially relevant projects.
- To inculcate right human values and professional ethics.

Quality Policy

Committed to achieve the status of preferred destination among the students by continually improving the quality of education.



2.1 Vision& Mission (B.Tech) Department wise: -

Applied Science:-

Vision

To establish this department as a base for other department's success and rally round inscribing Institution as a brand name in the country and in global arena. The long sightedness is of creating an indelible mark in the minds of the students for their conceptual approach to look forward towards the Department.

Mission

- To propel the department and personnel attached on the path of eternal success
- To accomplish the aim, make short goals to reach to the zenith.
- To refine students by instilling in them zeal to learn and adapting oneself in constantly updating new world of technology.
- To chisel the knowledge of the students through exposure of new techniques.

Computer Science & Engineering Department: -

Vision

To excel in Computer Science & Engineering and making professionals on global front through efficient technical education with socio-economic values.

Mission

- To achieve a distinguished position in Computer Science & Engineering through innovative teaching learning methods.
- To develop strong fundamentals and habit of life-long learning in students to fulfil the needs of Industry and society.
- To produce competent and capable computer science engineering professionals and to inculcate spirit of ethical values.
- To develop the good communication and leadership skill.

Information Technology Department:-

Vision

To achieve excellence in the field of Information Technology and create competent professionals for industry and socio-economic development to meet global challenges.

Mission

- To offer world class education in Information Technology through dynamic teaching learning process.
- To produce highly competent and technologically capable professionals to satisfy the needs of academia, industry and society.
- To inculcate lifelong learning abilities to understand, analyse, formulate and solve the real life problems by applying information technology skills.
- To impart professional values in view of ethical, ecological and economic context.

Electronics & Communication Engineering Department:-

Vision

To become a leading center of excellence in the technical education of Electronics & Communication Engineering and create competent professionals in thrust areas for the development of society and nation.

Mission

- To educate the students with the state of the art technologies through innovative teaching-learning process.

- To enable the graduates to develop the skills required to solve complex real time problems using tools and techniques of Electronics & Communication Engineering practice.
- To develop the spirit of innovation and creativity by collaborating with industries and research establishments to fulfil the needs of society.
- To practice high standards of human values, professional ethics and accountability.

Mechanical Engineering Department:-

Vision

The Department strives to be recognized at National and International level for creating competent professionals with outstanding technical knowledge in advanced field of Mechanical Engineering and research.

Mission

- To provide high quality technical education to the students and improving their skills through ICT based teaching learning process so that their employability is enhanced.
- To develop linkage with industry to achieve excellence in research and consultancy practices.

Electrical & Electronics Engineering Department:-

Vision

To achieve excellence in imparting education in the field of electrical and electronics engineering by creating competent professionals for Industry &Socioeconomic development to meet National and International needs.

Mission

To provide students with supportive environment that facilitates learning to solve the problems in the field of electrical and electronics engineering and to prepare them to be successful and ethical human beings as well as professionals as they move to industry, academia and other professions.

Electronics& Instrumentation Engineering Department:-

Vision

To become a leading center of excellence in field of instrumentation& industrial automation with embedded designing and create world class professionals in thrust areas for the development of society and nation.

Mission

- To produce quality and value based in vogue education in the field of instrumentation, control, electronics, embedded designing and industrial automation.

- To mould the students to be excellent industry centric instrumentation engineers with adequate governance skills.
- To inculcate the spirit of imagination ,synthesizing analytical competence, scientific intellect, business competency and entrepreneur skills.

Civil Engineering Department:-

Vision

To excel in technical education in field of Civil Engineering to create competent professionals with Socio-economic values to meet requirements at National & International level.

Mission

- To achieve a distinguished position in technical education of Civil Engineering through innovative teaching learning methods.
- To develop strong fundamentals, skills and attitude of the lifelong learning in students to fill the current and future needs of industry to serve the society efficiently.
- To produce competent and capable Civil Engineering professional through industry academic stimulus.
- To develop the good communication and leadership skill with spirit of ethical values.

2.2 KIET School of Pharmacy:-

Vision

To excel in technical education in the field of pharmaceutical science and technology and to create competent pharmaceutical professionals with socio-economic values to meet the requirements at national and international level.

Mission

- To achieve distinguished position in technical education of pharmaceutical science and technology through innovative teaching, learning and using ICT effectively.
- To provide strong fundamentals and conceptual knowledge with essential sills to cater the need of pharmaceutical industry, profession and society as a whole.
- To produce competent and capable pharmaceutical science and technology professionals through industry academia collaboration.
- To develop the good communication and leadership skills with spirit of professional ethics and values.

2.3 Master of Business Administration (MBA):-

Vision

To attain excellence in management education and create competent managers who serve as a valuable resource for industry & society both nationally and internationally.

Mission

- To achieve academic excellence in the field of management through advanced teaching learning process.
- To imbibe professional ethics through value based education.
- To encourage analytical thinking for continuous improvement.
- To produce competent managers for industry, academics, entrepreneurship and other profession.

2.4 Master of Computer Application (MCA):-

Vision

The vision of the department is to achieve excellence, be a leader in the field of computer applications, to nurture students by inculcating knowledge for contribution in Industry and Socio-economic development to meet global challenges.

Mission

- To offer state-of-art education in Computer Science and Applications.
- To provide strong conceptual foundation complemented with extensive practical training.
- To inculcate value-based, socially committed professionalism to the cause of overall development of students and faculty.

Note: - After formation of Vision & Mission of the institute, approval will be taken from Chairman forwarded by Director's Office. At department level approval will be taken from Director/Chairman.

3. Program Education Objectives

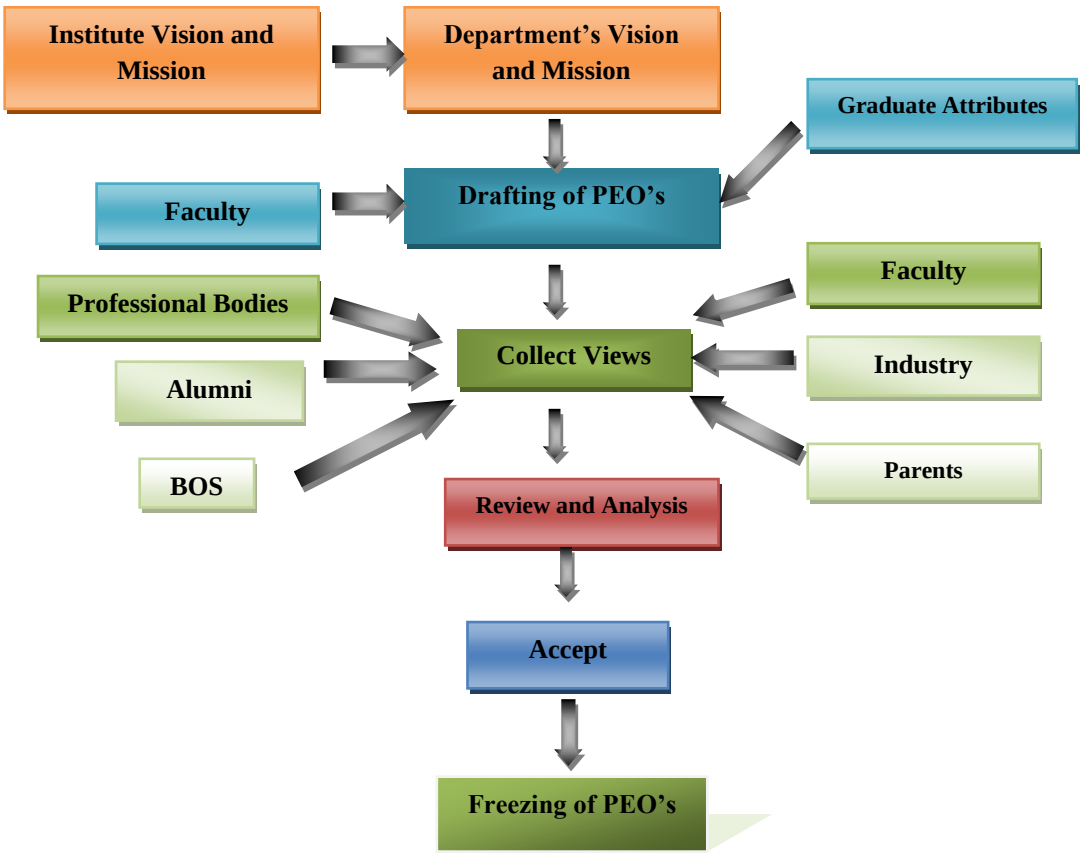
Program Education Objectives (PEO's) of the program seeking accreditation may form 3 to 5 PEOs. All the departments will finalise the PEO's program wise, branch wise with the help of department BoS (Particular Program) and after finalising of the PEOs by departments will take approval from Director/Dean.

- The PEOs should be consistent with the mission of the institution.
- All the stakeholders **(Students, Faculty, Industry, Employer, Parents, Society and Government)** should participate in the process of framing PEOs. (Different surveys to be

conducted from stake holders & analysed for the formation of PEO's AT DEPARTMRNT LEVEL)

- PEO's should be based on the needs of the stakeholders.
- PEO's should be achievable by the programme.
- PEO's should not be too narrow and similar to the PO's.
- The number of PEOs should be manageable.
- The programme shall demonstrate how the PEOs are aligned with the mission of the department /institution.
- The PEOs are reviewed periodically based on feedback of the programme's various stakeholders.
- **The department PEOs will be formed by Department BoS & final draft will be forwarded to Director's office for final approval.**

Note: - Survey Forms Attached as Annexure from 1 to 7 (1. Curriculum Feedback Survey, 2. Graduate Exit Survey, 3. Alumni feedback Survey, 4. Employer Feedback Survey, 5. Society Opinion Survey, 6. Parents Opinion Survey, 7. Industry Opinion Survey)



3.1 Education Objectives of KIET Group of Institutions:-

I. To provide high standard of technical, management & professional knowledge through quality education.
II. To provide a high quality education in various disciplines of engineering, management & other programmes by conducting effective teaching learning sessions & co-curricular activities.
III. To encourage the students to attain excellent technical& management skills obtained through contextual analysis, critical thinking, quantitative reasoning and acquiring knowledge through various e-learning processes.
IV. To develop life-long learning skills that allow them to be adaptive & responsive to changes in society, technology, and the environment, as well as career demands.

Note: - On the basis of above mentioned education objectives all departments will form their PEO'S (Program Education Objectives).

3.2 Program Education Objectives (B.Tech) Department wise:-

Computer Science & Engineering Department:-

I. To apply the knowledge of computer science and engineering necessary to formulate, analyse and solving engineering problems and making them employable/capable for higher studies and able entrepreneur.
II. To automate the real time applications designing software and hardware systems using modern tools and techniques with full competencies.
III. To develop the good communication skills (verbal and written), conducive interpersonal attitude and able leadership qualities.
IV. To provide quality and worthy services towards their profession and to render with social and ethical values.
V. To inherit the attitude of lifelong learning to higher studies, research and latest technological advancement.

Information Technology Department:-

I. To enrich students with fundamental knowledge, effective computing, problem solving, and communication skills enable them to have successful career in Information Technology.
II. To enable students in acquiring Information Technology's latest tools, technologies and management principles to give them an ability to solve multidisciplinary engineering problems.
III. To impart students with ethical values and commitment towards sustainable development in collaborative mode.
IV. To imbibe students with research oriented and innovative approaches which help them to

identify, analyse, formulate and solve real life problems and motivates them for lifelong learning.

V. To empower students with leadership quality and team building skills that prepare them for employment, entrepreneurship and to become competent professionals to serve societies and global needs.

Electronics & Communication Engineering Department:-

I. Acquire fundamental knowledge of Electronics & Communication Engineering to become employable and capable of pursuing higher studies.

II. Have sound foundation required to develop hardware & software solutions necessary for analysis, design and implementation of modern Electronics & Communication Engineering systems.

III. Develop effective communication skills and interpersonal behaviour to become a cooperative team member and able leader.

IV. Provide quality and worthy service towards their profession with societal and ethical values.

V. Inculcate the habit of life-long learning needed for higher studies and research and continue to develop new methodologies and technologies.

Mechanical Engineering department:-

I. To prepare the students to excel in industry/technical profession through quality education.

II. To build a sound foundation in science, mathematics and management principles to enable the students to grasp the core concepts of mechanical engineering.

III. To inculcate high professional and ethical attitude in students along with strong communication skills, multitasking approach and team spirit.

IV. To enhance student's ability to analyse real life problems and provide viable solutions with design and developments of socially relevant projects.

V. To create conducive environment for the students through strong industry academia connect and habit of lifelong learning using latest and advanced technological tools.

Electrical & Electronics Engineering Department:-

I. To educate students in mathematical, scientific, electrical and electronics engineering concepts necessary to formulate, analyze and solve engineering problems faced by society.

II. To prepare students to communicate effectively, work harmoniously in teams with professional ethics and learn to adopt an integrated approach to problems in the field of electrical and electronics engineering by using latest and advanced technology tools.

III. To prepare students to have broad understanding of the engineering and management principles and apply the acquired knowledge in solving complex and multidisciplinary engineering problems.

IV. To equip students with the knowledge to design and develop engineering solutions to the problems faced by society for its sustainable development with the help of environment friendly technologies.

V. To inculcate the ability among the students to explore and learn by themselves, the changes taking place continuously in the field of engineering and technology as part of lifelong learning process.

Electronics& Instrumentation Engineering Department:-

I. To prepare students for employment in the core industrial/manufacturing sector.

II. To prepare students for employment in research and development organizations.

III. To prepare students for employment in Automation & IT/ITES (IT Enabled Service industry.

IV. To prepare students for higher studies in Engineering and Management.

V. To prepare students for Entrepreneurship in the long run

Civil Engineering department:-

I. To apply the knowledge of Civil Engineering necessary to formulate, analyse and solving engineering problems and making them employable, capable for higher studies and able entrepreneur.

II. To automate the construction industry using modern tools and techniques with full competencies.

III. To develop good communication skills (verbal and written), conducive interpersonal attitude and able leadership qualities.

IV. To provide quality and worthy services towards their profession and render them with social and ethical values.

V. To inherit the attitude of lifelong learning to higher studies, research and latest technology advancement

3.3 KIET School of Pharmacy:-

I. To prepare the students to excel in pharmaceutical industry and profession through quality and innovative teaching learning process.

II. To build a sound foundation in science, mathematics and management principles to enable the students to grasp the core concepts of pharmaceutical science and technology.

III. To inculcate high professional and ethical attitude in students along with strong communication skills, multi- tasking approach and team spirit.

IV. To enhance student's ability to analyze real life problems and provide viable solutions with design and developments of socially relevant projects.

V. To create a conducive environment for the students through strong industry academia partnership and practice of life-long learning using latest and advanced technological tools.

3.4 Program Education Objectives (PEO's) for MBA:-

I. Students will be able to attain a general level of competence in management to act with creative, innovative and entrepreneurial potential using management tools.

II. Students will be able to adapt to rapidly changing environment and become responsible and value driven citizens committed to themselves, co-workers, organization, the society and the Nation for sustainable development.

III. Students will be able to demonstrate strong interpersonal communication, multi-disciplinary teamwork and leadership skills to enable them to fulfil professional responsibilities.

IV. Students will be able to possess professional competence to be involved in quality research and lifelong learning for continuous growth and development.

3.5 Program Education Objectives (PEO's) for MCA:-

I. To build sound foundation in mathematical, computer science and application concepts necessary to formulate, analyze and solve computer application problems faced by society.

II. To communicate effectively, work harmoniously in teams with professional ethics and learn to adopt an integrated approach to solve problems using good analytical, design and implementation skills.

III. To create conducive environment for the students who will contribute to society as decisive, expressive, ethical and responsible citizens with proven expertise.

IV. To enrich students with effective communication skills, documentation skills, financial management skills and practices to give them an ability to solve multidisciplinary problems.

V. To empower students with team building skills and leadership qualities that prepares them for employment, entrepreneurship and competent professionals to serve society and as per global needs.

3.6 Mapping of PEOs with Mission (Target Level Mission)

PEOs / Mission	M1	M2	M3	M4
PEO 1	3	2	2	3
PEO 2	2	3	2	2
PEO 3	3	2	2	2
PEO 4	3	2	3	3
PEO 5	2	3	3	3
Target Level Mission	**2.6**	**2.4**	**2.4**	**2.6**

Note: - Target level of Mission Identified.

3.7 Mapping of POs/PSOs with PEOs (Target Level PEOs)

PO	PEO (Mapping)				
	PEO-1	PEO-2	PEO-3	PEO-4	PEO-5
PO-1	3	2	2	2	3
PO-2	3	2	3	2	3
PO-3	3	1	2	2	3
PO-4	3	1	2	2	2
PO-5	2	1	2	2	3
PO-6	2	2	3	2	3
PO-7	1	3	2	1	2
PO-8	1	3	1	1	2
PO-9	2	3	2	2	2
PO-10	2	3	2	3	2
PO-11	2	3	2	2	3
PO-12	3	3	3	2	2
PSO 1	2	2	2	2	2
PSO 2	2	2	2	2	2
Target Level PEOs	2.21	2.25	2.17	2.5	2.75

Note: - Target level of PEOs identified

4. Programme Outcomes (POs) & Program Specific Outcomes (PSOs)

POs-Graduates Attributes (GAs) form a set of individually assessable outcomes that are the components indicative of the graduate's potential to acquire competence to practice at the appropriate level. The Graduates Attributes are exemplars of the attributes expected of a graduate from an accredited programme. NBA has defined the Graduate Attributes for each discipline (UG Engineering, PG Engineering, Diploma Engineering, UG and PG Pharmacy, MCA, MBA etc.). **PSOs - Program shall specify 2-4 program specific outcomes.**

4.1 NBA's Graduate Attributes of UG B Tech programme are as follows: -

Engineering Graduates will be able to: -

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **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.
4. **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**.**
5. **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 the limitations.
6. **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.
7. **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.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **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.
11. **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.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

4.2 NBA's Graduate Attributes of UG Pharmacy programme are as follows:-

Pharmacy Graduates will be able to:-

1. **Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioural, social, and administrative pharmacy sciences; and manufacturing practices.
2. **Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3. **Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
4. **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
5. **Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
6. **Professional Identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
7. **Pharmaceutical Ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behaviour that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

8. **Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
9. **The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
10. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
11. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self access and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

4.3 NBA's Graduate Attributes of PG MCA programme are as follows:-

1. **Computational Knowledge:** Apply knowledge of computing fundamentals, computing specialisation, mathematics, and domain knowledge appropriate for the computing specialisation to the abstraction and conceptualisation of computing models from defined problems and requirements.
2. **Problem Analysis:** Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.
3. **Design /Development of Solutions:** Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
4. **Conduct investigations of complex Computing 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.
5. **Modern Tool Usage:** Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.
6. **Professional Ethics:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.
7. **Life-long Learning:** Recognise the need, and have the ability, to engage in independent learning for continual development as a computing professional.
8. **Project management and finance:** Demonstrate knowledge and understanding of the computing 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.

9. **Communication Efficacy:** Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.
10. **Societal and Environmental Concern:** Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.
11. **Individual and Team Work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.
12. **Innovation and Entrepreneurship:** Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

4.4 NBA's Graduate Attributes of PG MBA programme are as follows:-

1. Apply knowledge of management theories and practices to solve business problems.
2. Foster Analytical and critical thinking abilities for data-based decision making.
3. Ability to develop Value based Leadership ability.
4. Ability to understand, analyze and communicate global, economic, legal, and ethical aspects of business.
5. Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

Note: Program (MBA) may add up to three additional POs.

The POs formulated for each programme by the institute must be consistent with the NBA's Graduate Attributes.

The POs must foster the attainment of the PEOs. The programme shall indicate the process involved in defining and redefining the POs. It shall also provide how and where the POs are published and disseminated. It should also describe the process that periodically documents and demonstrates that the POs are based on the needs of the stakeholders of the programme.

The extent to which and how the POs are aligned with the Graduate Attributes prescribed by the NBA shall be provided. The correlation between the POs and the PEOs is to be provided as per the format given in the SAR in order to establish the contribution of the POs towards the attainment of the PEOs.

Precise illustrations of how course outcomes, modes of delivery of the courses, assessment tools are used to assess the impact of course delivery/course content, and laboratory and project course work are contributing towards the attainment of the POs shall be given by the programme.

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 programme 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 standardised 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.

5. Course Outcomes (COs)

Course Outcomes (COs) will be formed for each subject in all the programs. All the faculty members teaching a particular subject will formulate the course outcomes.

- COs will be formed by the faculty members teaching same subject and final approving authority for approving COs will be department BoS in consultation with HoD.
- Five COs can be decided per subject, and COs are formed by considering the learning levels of B**loom's Taxonomy**. COs are the overall learning's at the end of the subject. So we will form around five COs from the overall learning of subject by taking in to consideration **Bloom's taxonomy.**
- COs to be mapped with POs in Matrix form.
- Correlation levels 1, 2, 3 as defined (1: low, 2: Moderate, 3: High).
- COs will be mapped with POs on the basis of above-mentioned levels.
- If there is no correlation, put "-" or left blank or put zero.
- Attainment of PO's will be calculated on the basis of mapping done between COs & POs. We adopt two main components for attainment
- Direct Methods (Class test, Assignment/Tutorials, Seminar, Project, Lab attainment and University examination).
- Indirect Methods (Surveys - Curriculum Feedback survey, Graduate Exit Survey, Input from outside agencies i.e. AMCAT, Co-curricular & extra-curricular activities etc)
- **Course wise CO Attainment will be calculated by taking 70% contribution of external exam & 30% contribution of Internal Exams (70% + 30%).**
- **As per the guidelines of the SAR, the overall attainment of outcomes of a program (POs) is computed by adding direct attainment and indirect attainment values in the proportion of 80:20. That is, 80% of direct attainment and 20% of indirect attainment is taken into consideration.**
- **COs will be formed by concerned Faculty members in consultation with Department BoS. COs will be approved by department BoS after discussion with HoD.**

6. Bloom's Taxonomy for Assessment

For improving the structure and quality of assessment in our programs following points need to be remembered:-

- In Indian engineering education system written examinations play major role in assessing the learning and awarding of grades to the student. Universities and colleges give highest weight age to the outcomes of the written examinations in overall grading. Questions raised in the examination/ test papers play an important role in defining the level of learning the student is expected to achieve in the courses and hence in the program. Since, assessment drives learning, the design of question papers need to go beyond mere test of memory recall. They also need to test higher order abilities and skills.
- Written examinations assess a very limited range of outcomes and cognitive levels. Particularly in the courses, where course outcomes cover a broad range of expectations, written examinations alone will not be sufficient to make valid judgements about student learning. A wide range of assessment methods (example; term papers, open ended problem-solving assignments, course/ lab project rubrics, portfolios etc.) need to be employed to ensure that assessment methods match with learning outcomes.
- It is advisable to formulate assessment plans for each of the course in the program that brings clarity to the following

  a. Alignment of assessment with learning outcome of the course

  b. Level of learning (cognitive) student is expected to achieve

  c. Assessment method to be adapted

The following sections discuss application of blooms taxonomy framework to create optimal structure of examination papers to test the different cognitive skills.

6.1 Bloom's Taxonomy for Assessment Design

Bloom's Taxonomy provides an important framework to not only design curriculum and teaching methodologies but also to design appropriate examination questions belonging to various cognitive levels. Bloom's Taxonomy of Educational Objectives developed in 1956 by Benjamin Bloom was widely accepted by educators for curriculum design and assessment. In 2001, **Anderson and Krathwohl** modified Bloom's Taxonomy to make it relevant to the present-day requirements. It attempts to divide learning into three types of domains (cognitive, affective, and behavioural) and then defines the level of performance for each domain. Conscious efforts to map the curriculum and assessment to these levels can help the programs to aim for higher-level abilities which go beyond remembering or understanding, and require application, analysis, evaluation or creation.

Revised Bloom's taxonomy in the cognitive domain includes thinking, knowledge, and application of knowledge. It is a popular framework in engineering education to structure the assessment as it

characterizes complexity and higher-order abilities. It identifies six levels of competencies within the cognitive domain (Fig. 1) which are appropriate for the purposes of engineering educators.

According to revised Bloom's taxonomy, the levels in cognitive domain are as follows:-

Level	Descriptor	Level of attainment
1	Remembering	Recalling from memory of previously earned material
2	Understanding	Explaining ideas or concepts
3	Applying	Using information in another familiar situation
4	Analysing	Breaking information into part to explore understandings and relationships
5	Evaluating	Justifying a decision or course of action
6	Creating	Generating new ideas, products or new ways of viewing things

Bloom's Taxonomy is hierarchical, meaning that learning at the higher level requires that skills at lower level are attained.

Action Verbs for Assessment Choice of action verbs in constructing assessment questions is important to consider. Quite often, the action verbs are indicators of the complexity (level) of the question. Over the time, educators have come up with taxonomy of measurable verbs corresponding to each of the Bloom's cognitive levels. These verbs help us not only to describe and classify observable knowledge, skills and abilities but also to frame the examination or assignment questions that are appropriate to the level we are trying to assess.

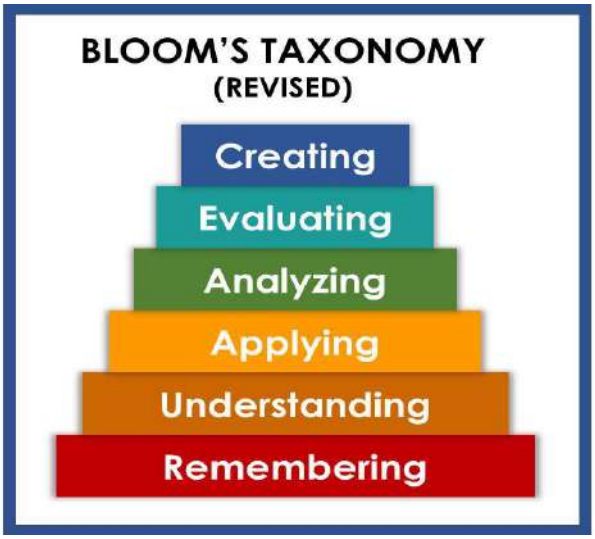


Fig. 1, Revised Bloom's Taxonomy

A suggestive list of skills/ competencies to be demonstrated at each of the Bloom's level and corresponding cues/ verbs for the examination/ test questions are given below:-

S No.	Level	Skill Demonstrated	Question / Verbs for tests
1.	**Remember**	• Ability to recall of information like, facts, conventions, definitions, jargon, technical terms, classifications, categories, and criteria. • Ability to recall methodology and procedures abstractions, principles, and theories in the field. • Knowledge of dates, events, places. • Mastery of subject matter	list, define, tell, describe, recite, recall, identify, show, label, tabulate, quote, name, who, when, where, etc.
2.	**Understand**	• Understanding information • Grasp meaning • Translate knowledge into new context • Interpret facts, compare, contrast • Order, group, infer causes • Predict consequences	describe, explain, paraphrase, restate, associate, contrast, summarize, differentiate interpret, discuss
3.	**Apply**	• Use information • Use methods, concepts, laws, theories in new situations • Solve problems using required skills or knowledge • Demonstrating correct usage of a method or procedure	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, experiment, show, examine, modify
4.	**Analyse**	• Break down a complex problem into parts. • Identify the relationships and interaction between the different parts of complex problem. • Identify the missing information, sometimes the redundant information and the contradictory information, if any.	classify, outline, break down, categorize, analyze, diagram, illustrate, infer, select
5.	**Evaluate**	• Compare and discriminate between ideas • Assess value of theories, presentations make • Choices based on reasoned argument verify value of evidence recognize subjectivity use of definite criteria for judgments	assess, decide, choose, rank, grade, test, measure, defend, recommend, convince, select, judge, support, conclude, argue, justify, compare, summarize, evaluate
6.	**Create**	• Use old ideas to create new ones • Combine parts to make (new) whole, • Generalize from given facts relate knowledge from several areas predict, draw conclusions	design, formulate, build, invent, create, compose, generate, derive, modify, develop, integrate

It may be noted that some of the verbs in the above table are associated with multiple Bloom's Taxonomy level. These verbs are actions that could apply to different activities. We need to keep in

mind that it's the skill, action or activity we need out students to demonstrate that will determine the contextual meaning of the verb used in the assessment question.

Assessment Planning - While using Bloom's taxonomy framework in planning and designing of assessment of student learning, following points need to be considered:-

- Before adopting this framework for reforms in examination system of a Institution, it is worthwhile to study the present pattern of assessment in each of the course in the program to gain insight about:
    - Alignment of assessment questions with course learning outcomes
    - Whether all the learning outcomes are tested; sometimes some learning outcomes are over tested at the expense of others which may be not tested at all.
    - Overall weight age in the assessment, to each of the Bloom's learning levels
    - Assessment methods used to adequately assess the content and desired learning outcomes

  Based on the study, improvement priorities for each of the above factors need to be arrived at. The reform process need to be well planned and implemented through institutional strategy and communicated to the all stakeholders particularly to the students.

- A good and reasonable examination paper must consist of various difficulty levels to accommodate the different capabilities of students. Bloom's taxonomy framework helps the faculty to set examination papers that are well balanced, testing the different cognitive skills without a tilt towards a tough or easy paper perception. If the present examination questions are more focussed towards lower cognitive skills, conscious efforts need to be done to bring in application skills or higher cognitive skills in the assessment. It is recommended that at institution/ University level, upper limit need to be arrived for lower order skills (for example, no more than 40% weight age for knowledge-oriented questions). It is important to note that, as nature of every course is different, the weight age for different cognitive levels in the question papers can also vary from course to course.
- Assign percentage wise marks as per Bloom's Level: - BL-1(Remembering) - 10%, BL-2 (Understanding) – 30%, BL-3 (Applying) & BL-4 (Analysing) – 50%, BL-5(Evaluating) & BL-6 (Creating) – 10% = Total 100% Distribution.
- After finalising the question paper we can find out the mapping between CO & Bloom's Level and we can set the Target Bloom's level wise.
- Format of the question paper is given (Annexure-8 attached) to be followed as per Bloom's Taxonomy.

BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating), CO – Course Outcomes, PO – Program Outcomes.

7. CO Attainment Methods

- The process of attainment of COs, POs starts from writing appropriate COs for each course of the program.
- Then, a correlation is established between COs and POs in the scale of 1 to 3, 1 being the slight (low), 2 being moderate (medium) and 3 being substantial (high).
- A mapping matrix is prepared in this regard for every course in the program including the elective subjects.
- The course outcomes written and their mapping with POs are reviewed frequently by a BoS before they are finalized. The following tables(Table – 1 to 5) shows the COs and the CO - Bloom's level mapping, CO & PO mapping, Bloom's target level and Bloom's Target level matrix for a sample course:

Table-1: Course Outcomes		
Course Name: - Course 1 - Basic Electrical Engineering (REE101/201)		
S No.	**Course Outcomes (COs)**	**BL**
Student will be able to:-		
1	Understand the concepts of electric circuit elements and network solutions with DC supply using various network theorems	2
2	Apply the concepts of single and three phase ac circuits for getting the network characteristics and solutions in terms of circuit elements, branch voltage and currents	3
3	Analyze the various aspects of performances and equivalent circuit design for transformers and Electrical machines	4
4	Illustrate the working principles of induction motor, synchronous machine as well as DC machine and employ them in different area of applications	3
5	Describe the components of low voltage electrical installations and perform elementary calculations for energy consumption.	1

Table-2 (Mapping of COs with Bloom's Level, Target Level Bloom's)						
Course -1	**BL-1**	**BL-2**	**BL-3**	**BL-4**	**BL-5**	**BL-6**
CO1						
CO2						
CO3						
CO4						
CO5						
Target Level (Av.)						

Table-3: Mapping of Course Outcomes with Program Outcomes/PSOs														
Course 1 - Basic Electrical Engineering														
PO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
CO-1	3	3	3	3	2	1	-	-	-	-	-	2	**2**	**2**
CO-2	3	3	3	3	2	1	-	-	-	-	-	2	**2**	**2**
CO-3	3	3	3	3	2	1	-	-	-	-	-	2	**2**	**2**
CO-4	3	3	3	3	2	1	-	-	-	-	-	2	**2**	**2**
CO-5	3	3	3	3	2	1	-	-	-	-	-	2	**2**	**2**
Target Level	**3**	**3**	**3**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**2**

Table – 4 (Target Level Bloom's for all the courses in the Department)						
	BL-1	**BL-2**	**BL-3**	**BL-4**	**BL-5**	**BL-6**
Course-1						
Course-2						
Course-3						
.....						
Lab Course						
Seminar						
Project						
Average Target Level						

Table-5: Target Level- Course Outcome (COs) –PO/PSO matrix for all the courses in the Department														
Course	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
Course1	**2.6**	**2.6**	**2.4**	**2.8**	**2**	**1.8**	**-**	**-**	**-**	**-**	**-**	**2.6**	**3**	**3**
Course2	**2.6**	**2.6**	**2.4**	**2.8**	**2**	**1.8**	**-**	**-**	**-**	**-**	**-**	**2.6**	**3**	**3**
…														
Lab Course														
Seminar														
Project														
Average Target Level	**2.6**	**2.6**	**2.4**	**2.8**	**2**	**1.8**	**-**	**-**	**-**	**-**		**2.6**	**3**	**3**

- From the mapping matrix of COs and POs for all the courses as above, a 'Program level Target of each PO/PSO matrix' of all the courses is prepared.
- Table-3 shows CO-PO/PSO mapping matrix. For convenience and simplicity, only one course is shown with hypothecated mapping values
- Table 2&4 are formed after finalising the question paper for CTs as per Bloom's.

7.1 Attainment of COs (Direct Attainment Methods)

- Course Outcomes are narrower statements that describe what students are expected to know, and be able to do at the end of each course. These relate to the skills, knowledge, and behaviour that students acquire in the course.
- In a university affiliated college, the CO attainment levels can be measured based on the results of the **internal assessment (**Class test, Assignment/Tutorials, Seminar, Project, Lab attainment) and **external examination** conducted by the university. **This is a form of direct measurement of attainment.**
- Target level of External Exams for any subject will be average of marks obtained by students of that subject in last three years.
- Target level of Internal Exams for any subject will be average marks obtained by students of that subject calculated from CT marks (Excluding TA Marks) in last three years.
- Three internal assessment tests are conducted for each course in a semester. In each test, the percentage of students who achieve a set target (usually, 60% of the maximum marks or average of marks in last three years, i.e., 15 of 25) for the COs that are covered is computed.
- After the three tests, the average of these percentages is computed to decide the attainment level. NBA has given, in its SAR format, **the following example guidelines** for arriving at an attainment level:

  Attainment Level 1: 50% of students score more than Subject Average (Target) decided by Department with due justification,

  Attainment Level 2: 60% of students score more than Subject Average (Target) Decided by Department with due justification,

  Attainment Level 3: 70% of students score more than Subject Average (Target) Decided by Department with due justification.
- For the case example considered, in the internal assessment (IA) tests, the target attainment level for each CO and for each student is set at 60% of the maximum marks for a question or a group of questions. The percentage of students attaining this target level of each CO is computed and the average of these percentages is considered for deciding the attainment level of course outcome as shown above in the example guidelines.
- **The process of computing CO attainment in internal assessment for Class tests (CTs) is shown in Table-6. Other components of internal assessment can be calculated in the same manner (Assignment/Tutorials, Seminar, and Project). From the table, it is found that the percentages of students attaining CO1, CO2, CO3, CO4& CO5 are 100 (1.00), 63 (0.63), 98**

(0.98), 0.87, 0.54respectively. Hence, the average percentage of students who attained the entire COs is 80.4 (0.804). This corresponds to Course Attainment level of 3.

- Similarly, after the declaration of the university results, the percentage of students who attained the COs is computed. Here, it is assumed that the questions answered by a student cover all the course outcomes defined for that course. From Table-6 (please refer last two columns), it is found that only 8 percent of students have scored more than 60% of the maximum marks in the course. Hence, the attainment level in this case is **0** as per the example guidelines suggested in the SAR of NBA.

  Attainment Level 1: 50% of students score more than Subject Average (Target) decided by Department with due justification,

  Attainment Level 2: 60% of students score more than Subject Average (Target) Decided by Department with due justification,

  Attainment Level 3: 70% of students score more than Subject Average (Target) Decided by Department with due justification.

- In a meeting of senior faculty & BoS members in the department, the target attainment level (percent of marks scored by a student in a course) for deciding the course attainment level decided. The faculty may argued that this target should be set based not only on the university previous results for 3-4 years but also on the type of course (subject) and the quality of students admitted.

- In engineering programs, there are few courses which students feel rather difficult compared to other courses. In many courses, **the target percent of marks scored by the students is set by the course faculty member based on the university results of the course in the institute in the past three years.** Hence, for calculation purpose the average external marks in the sample subject for three years is 42%. The target was reduced to 42% (that is, a student should score 42 marks or more for attaining a CO).

Table 6:-Percentage of students attaining course outcomes and attainment level
Course 1- Basic Electrical Engineering (For Example)

Course 1 (Assumed Values)			Test 1				Test 2				Test 3		Univ result	Target Level
			CO1	>= 60%	CO2	>= 60%	CO3	>= 60%	CO4	>= 60%	CO5	>= 60%	All COs	>=42 %
S. No	USN*	Name of the Student	MM 5		MM 20		MM 10		MM 15		MM 25		MM 100	
1		Student 1	4	Y	20	Y	10	Y	14	Y	20	Y	55	Y
2		Student 2	5	Y	18	Y	9	Y	13	Y	A	NA	59	Y
3		Student 3	5	Y	19	Y	8	Y	12	Y	23	Y	76	Y
4		Student 4	5	Y	9	N	9	Y	12	Y	A	NA	61	Y
5		Student 5	5	Y	14	Y	8	Y	12	Y	A	NA	65	Y
6		Student 6	5	Y	17	Y	9	Y	13	Y	A	NA	66	Y
7		Student 7	5	Y	16	Y	8	Y	14	Y	A	NA	65	Y
8		Student 8	4	Y	19	Y	9	Y	8	N	22	Y	62	Y
9		Student 9	4	Y	18	Y	8	Y	5	N	A	NA	63	Y
10		Student 10	4	Y	11	N	9	Y	4	N	A	NA	66	Y
11		Student 11	3	Y	10	N	8	Y	12	Y	A	NA	61	Y
12		Student 12	3	Y	16	Y	9	Y	13	Y	A	NA	68	Y
13		Student 13	5	Y	19	Y	8	Y	15	Y	A	NA	56	Y
14		Student 14	5	Y	10	Y	9	Y	16	Y	24	Y	48	Y
15		Student 15	5	Y	9	N	8	Y	7	N	A	NA	45	Y
16		Student 16	4	Y	8	N	A	NA	8	N	A	NA	69	Y
17		Student 17	4	Y	19	Y	7	Y	6	N	A	NA	55	Y
18		Student 18	4	Y	20	Y	8	Y	A	NA	A	NA	59	Y
19		Student 19	5	Y	A	NA	A	NA	A	NA	19	Y	56	Y
20		Student 20	5	Y	18	Y	9	Y	A	NA	A	NA	42	Y
21		Student 21	5	Y	17	Y	9	Y	13	Y	A	NA	42	N
22		Student 22	5	Y	9	N	7	Y	14	Y	A	NA	45	N
23		Student 23	3	Y	16	Y	7	Y	15	Y	A	NA	49	N
24		Student 24	3	Y	7	N	8	Y	14	Y	18	Y	54	N
25		Student 25	3	Y	8	N	8	Y	14	Y	A	NA	56	N
26		Student 26	3	Y	19	Y	9	Y	14	Y	A	NA	59	N
27		Student 27	5	Y	18	Y	9	Y	13	Y	A	NA	43	N
28		Student 28	5	Y	17	Y	6	Y	12	Y	A	NA	44	N
29		Student 29	5	Y	8	N	5	N	12	Y	A	NA	45	N
30		Student 30	5	Y	9	N	9	Y	14	Y	A	NA	59	N
31		Student 31	5	Y	17	Y	9	Y	14	Y	A	NA	55	N
32		Student 32	3	Y	9	N	9	Y	13	Y	A	NA	25	N
33		Student 33	3	Y	16	Y	8	Y	13	Y	A	NA	26	N
34		Student 34	4	Y	8	N	A	NA	14	Y	A	NA	24	N
35		Student 35	4	Y	17	Y	7	Y	13	Y	19	Y	36	N
36		Student 36	4	Y	9	N	7	Y	14	Y	A	NA	36	N
37		Student 37	4	Y	17	Y	8	Y	13	Y	A	NA	35	N
38		Student 38	5	Y	9	N	8	Y	14	Y	A	NA	35	N
39		Student 39	5	Y	9	N	9	Y	13	Y	9	N	32	N
40		Student 40	5	Y	20	Y	9	Y	14	Y	9	N	34	N
41		Student 41	5	Y	20	Y	8	Y	13	Y	9	N	34	N
42		Student 42	5	Y	20	Y	8	Y	12	Y	9	N	34	N
43		Student 43	A	NA	9	N	7	Y	12	Y	9	N	32	N
44		Student 44	5	Y	19	Y	7	Y	12	Y	9	N	33	N
45		Student 45	5	Y	16	Y	8	Y	12	Y	A	NA	35	N
45		Student 46	5	Y	8	N	9	Y	12	Y	A	NA	36	N
47		Student 47	5	Y	17	Y	9	Y	13	Y	A	NA	35	N
48		Student 48	5	Y	17	Y	9	Y	13	Y	A	NA	36	N
49		Student 49	5	Y	19	Y	8	Y	13	Y	A	NA	35	N
50		Student 50	5	Y	18	Y	8	Y	13	Y	A	NA	34	N
Y				49		31		46		41		7		20
N				0		18		1		6		6		30

NA(Absent)	1	1	3	3	37	0
	CO 1	CO 2	CO3	CO4	CO 5	
Total Y i.e Obtained Y	Total Number of **Yes** for **CO1** in all Internal Exams = **Y1 = 49**	Total Number of **Yes** for **CO2** in all Internal Exams = **Y2 = 31**	Total Number of Yes for **CO3** in all Internal Exams = **Y3 = 46**	Total Number of Yes for **CO4** in all Internal Exams = **Y4 = 41**	Total Number of Yes for **CO5** in all Internal Exams = **Y5 = 7**	**Y/Y+N=62%**
Total N	Total Number of **No** for **CO1** in all Internal Exams = **N1 = 0**	Total Number of **No** for **CO2** in all Internal Exams = **N2 = 18**	Total Number of **No** for **CO3** in all Internal Exams = **N3 = 01**	Total Number of Yes for **CO4** in all Internal Exams = **N4 = 06**	Total Number of **No** for **CO5** in all Internal Exams = **N5 = 6**	
Total (Y+N) = i.e Max. Y	**Y1+N1 = 49**	**Y2+N2 = 49**	**Y3+N3 = 47**	**Y4+N4 = 47**	**Y5+N5 = 13**	
%age Attainment CO Wise i.e Obtained Y / Max. Y	**Y1/Y1+N1 = 100%**	**Y2/Y2+N2 = 63%**	**Y3/Y3+N3 = 98%**	**Y4/Y4+N4 = 87%**	**Y5/Y5+N5 = 54%**	
CO Wise Attainment Level	**3**	**2**	**3**	**3**	**1**	**2**
Overall %age Attainment Level	**Total Y/Total(Y+N) = Obtained Y/Max Y = (49+31+46+41+7)/(49+49+47+47+13) = 174/205 84.87%**					
Overall Attainment Level	**3**					

USN* - University Roll Number

- In **Table-6** sample calculation method is provided for Class Test & University result only. Similarly we can calculate the attainment level for other components of Direct Methods (Assignment/Tutorials).
- The guidelines for deciding the attainment levels are then modified as:

  Attainment Level 1: 50% of students score more than 42% marks.

  Attainment Level 2: 60% of students score more than 42% marks.

  Attainment Level 3: 70% of students score more than 42% marks.
- From the table-6, it is found that only 62% of students have scored more than 42% of marks. Hence, the CO attainment level in SEE is **02**.
- Direct Methods includes Class test, University examination, **Assignment (TA Marks which includes Teacher Assessment plus Attendance)**, Seminar, Project, Lab attainment. In **Table-7** the overall CO attainment course wise by direct methods is calculated.

Table – 7 Course Wise Overall CO Attainments (Direct Attainment Method)

Course	Class Test (From Table - 4) (A)	Assignment (TA Marks) (B)	Overall Internal on scale of 3 (A+B)/2	University Result (From Table - 4)	Course wise Overall Attainment 30% of Internal + 70 % of External
Course1	**03**	**02**	**2.5**	**2**	**(2.5x 0.3 + 2x 0.7)/ = 2.15**
Course2					
…..					
Lab Course					
Course N					
Seminar					
Project	**Presentations & Report Submissions**				

- Course wise CO Attainment will be calculated by taking 70% contribution of external exam & 30% contribution of Internal Exams (70% + 30%).

The overall CO attainment level in the course considered is computed as:

Overall CO Attainment Course 1 :-(2.5x 0.3 + 2x 0.7)/ = 2.15. Similarly we can calculate for other courses also. The above procedure of computing overall CO attainment is to be repeated for each course from first year to final year in an academic year (including opted electives, project work and technical seminars in final year) in order to enable computation of PO.

- All departments will take the approval from Director for the target levels (Subject wise, Session wise) which are decided by departments for Internal & External exams. They will take one example of one subject for defining internal & external targets i.e how the targets are calculated, for remaining subjects they will define all internal & external targets with procedure duly approved in department BoS as per specified format.
- AS will maintain the target level section wise on KIET portal for their internal analysis.
- Department will do exercise on excel sheet branch wise & will fix the targets accordingly & will provide this CO & PO attainment data to the respective department in each semester (Before beginning of next semester).
- AS department will take the approval from Director for the target levels as decided above (Subject wise, Session wise, Dept Wise) for Internal & External exams in the specified format. All these target levels should be framed with procedure & duly approved by the department BoS.

7.2 Attainment of Program Outcomes (POs)

- Program Outcomes (POs) are one step broader statements than COs that describe what students are expected to know and be able to do upon the graduation. These relate to the skills, knowledge, and behaviour that students acquire in the program. In June, 2015 format of SAR, the programs used to define the POs based on the graduate attributes.
- It is required to compute the attainment levels of POs. Program outcomes are attained through the attainment of COs. This is called direct attainment of POs.
- The PO attainment values are computed as shown in **Table-8**. Sample computation of PO given as under:-

  PO-1 attainment value = (Corresponding cell value from Table-5 for Course 1 x Overall CO attainment value for course1 from table-7)/3 = (2.6 x 2.15)/3 = 1.86. Similarly we can calculate the attainment value of other POs for course-1 & other courses.

- The direct attainment of POs is the average of individual PO attainment values. From table 8, the direct attainment of **PO1 is (1.86+2.5)/2 = 2.18**. The direct attainment of other POs is computed in the same manner and is shown in the table-6. Similarly other values can be calculated.

Table-8:-Overall PO Attainment of Direct Methods													
Course	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
Course1 (Assumed)	**1.86**	**1.86**	**1.72**	**2.00**	**1.46**	**1.32**	-	-	-	-	-	**1.86**	**2.15**	**2.15**
Course2 (Assumed)	2.5	3	3	2.7	2.8	3	-	-	-	-	-	2.6	3	3
Course3 (Assumed)	-	-	-	-	-	3	2.8	2.7	2.5	2.5	2.5	2.5	-	-
……														
Course N														
Seminar														
Project														
Overall PO Attainment Direct Methods	**2.18**	**2.43**	**2.36**	**2.35**	**2.13**	**2.44**	**2.8**	**2.7**	**2.5**	**2.5**	**2.5**	**2.33**	**2.58**	**2.58**

7.3 Indirect Attainment Methods

- For determining indirect attainment of POs, SAR suggests: Curriculum Feedback Survey, Graduate Exit Survey, Industry Opinion Survey, input from outside agencies, Co-curricular & Extra Curricular Activities. A questionnaire (Annexure -2, Graduate Exit Survey Form) was designed for this purpose, **that questionnaire is directly mapped with POs/PSOs and the average responses for each PO/PSO is computed.** Similarly PO attainment can be calculated for other components of indirect methods.
- **In Table -9 Sample calculation for indirect attainment by using graduate exit survey is given as under:**

Table: -9 Sample Calculations Indirect Attainment Method															
S No	USN	Student Name	GRADUATE STUDENTS EXIT SURVEY Questionnaire will be mapped with POs/PSOs											PSO 1	PSO 2
			1	2	3	4	5	6	7	8	9	10	11	12		
1		Student	3	4	3	3	3	3	3	3	3	3	3	4	4	4
2		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3		Student	3	3	4	2	2	3	1	3	3	2	4	2	2	2
4		Student	3	4	3	3	4	4	4	4	4	3	3	4	4	4
5		Student	3	3	4	3	3	3	4	3	3	4	3	4	4	4
6		Student	3	2	3	3	2	2	3	3	3	3	3	2	2	2
7		Student	3	3	3	3	3	2	1	2	1	2	2	3	3	3
8		Student	3	3	2	3	1	2	2	1	2	2	3	3	3	3
9		Student	3	2	4	4	3	4	3	3	3	3	4	3	3	3
10		Student	3	3	3	3	2	1	2	1	2	2	1	3	3	3
11		Student	4	4	4	4	4	3	3	4	4	3	4	4	4	4
12		Student	3	3	3	2	4	4	3	3	4	4	4	3	3	3
13		Student	4	4	4	4	3	3	3	4	4	3	3	3	3	3
14		Student	3	3	3	3	3	4	3	3	3	3	4	4	4	4
15		Student	3	4	3	3	3	4	3	4	3	4	4	4	4	4
16		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
17		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
18		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
19		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
20		Student	4	3	3	4	4	3	4	3	4	4	4	4	4	4
21		Student	4	3	4	4	4	3	4	4	4	4	4	3	3	3
22		Student	3	4	4	4	3	3	4	3	4	4	4	3	3	3
23		Student	3	2	2	4	3	3	4	3	3	3	2	2	2	2
24		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
25		Student	4	3	3	4	4	3	3	4	4	4	4	3	3	3
26		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
27		Student	3	3	4	4	3	4	4	3	4	3	3	4	4	4
28		Student	3	2	3	2	3	3	3	2	4	2	4	2	2	2
29		Student	4	4	4	3	4	4	4	3	4	3	4	4	4	4
30		Student	3	4	4	3	3	2	4	4	3	4	4	4	4	4
31		Student	3	3	4	3	3	3	3	4	3	3	3	4	4	4
32		Student	3	2	2	1	3	3	4	2	2	3	4	3	3	3
33		Student	3	3	3	4	3	4	3	4	3	4	4	3	3	3
34		Student	4	3	4	4	3	3	4	4	3	4	3	3	3	3
35		Student	4	4	4	3	3	4	4	4	4	4	3	4	4	4
36		Student	3	3	4	4	4	4	4	4	3	4	3	4	4	4
37		Student	3	4	4	3	3	4	3	3	4	4	4	3	3	3
38		Student	3	4	4	4	3	3	4	4	4	3	3	4	4	4
39		Student	3	4	3	3	3	3	4	4	4	4	4	3	3	3
40		Student	3	3	3	4	2	3	3	4	3	3	3	4	4	4
41		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
42		Student	2	3	3	2	3	3	2	3	2	2	3	3	3	3
43		Student	3	3	3	4	4	4	4	4	4	3	4	4	4	4
44		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
45		Student	3	3	4	4	4	3	4	4	4	4	3	4	4	4
46		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
47		Student	3	3	3	3	3	3	3	3	3	3	3	3	3	3
48		Student	3	2	4	4	3	4	4	2	3	3	3	3	3	3
49		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
50		Student	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Average Value (Max			3.38	3.36	3.54	3.46	3.32	3.38	3.46	3.42	3.46	3.42	3.52	3.5	3.5	3.5

Value-4)														
Indirect Attainment out of 3	**2.55**	**2.52**	**2.67**	**2.61**	**2.49**	**2.55**	**2.61**	**2.57**	**2.60**	**2.57**	**2.64**	**2.64**	**2.64**	**2.64**

- Table 10 & 11 explains the process of attainment of Bloom's level & Gap analysis of Bloom's level.
- The indirect attainment of POs is the average of individual PO attainment values. **From table 12**, the average attainment of PO1 is (2.55+1.95/2 = 2.25. **The indirect attainment of other POs is calculated in the same manner and is shown in the table-12.**
- As per the guidelines of the SAR, the overall attainment of outcomes of a program (POs) is computed by adding direct attainment and indirect attainment values in the proportion of 80:20. That is, 80% of direct attainment and 20% of indirect attainment is taken into consideration.

7.4 Bloom's Level Attainment

Table 10-Bloom's Level Attainment Table							
Subject Name:-		**Bloom's Level**					
Roll No.	**Name of the Student**	**BL-1**	**BL-2**	**BL-3**	**BL-4**	**BL-5**	**BL-6**
1							
2							
3							
4							
5							
6							
....							
....							
Average Attainment Bloom's Level							

Table 11-Gaps in Bloom's Level						
	BL-1	BL-2	BL-3	BL-4	BL-5	BL-6
Target Level (Av.)						
Average Attainment Bloom's Level						
Gap						

Table-12- Overall PO Attainment of Indirect Methods														
Indirect Methods	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
Graduate Exit Survey(Annexure-2)	**2.55**	**2.52**	**2.67**	**2.61**	**2.49**	**2.55**	**2.61**	**2.57**	**2.6**	**2.57**	**2.64**	**2.64**	**2.64**	**2.64**
Curriculum Feedback Survey (Annexure-1)	1.95	1.68	1.43	1.29	1.31	1.55	2.39	2.46	2.84	2.66	2.50	2.08	2.50	2.08
Industrial Training Assessment														
Input from outside agencies i.e. AMCAT														
Co-curricular & Extra Curricular Activities														
Overall PO Attainment In-Direct Methods	**2.25**	**2.10**	**2.05**	**1.95**	**1.90**	**1.95**	**2.50**	**2.51**	**2.72**	**2.62**	**2.57**	**2.36**	**2.57**	**2.36**

Table-13: Overall PO Attainment Values														
Overall PO Attainment Direct Methods	**2.18**	**2.43**	**2.36**	**2.35**	**2.13**	**2.44**	**2.8**	**2.7**	**2.5**	**2.5**	**2.5**	**2.33**	**2.58**	**2.58**
Overall PO attainment Indirect Methods	**2.25**	**2.10**	**2.05**	**1.95**	**1.90**	**1.95**	**2.50**	**2.51**	**2.72**	**2.62**	**2.57**	**2.36**	**2.57**	**2.36**
Overall PO attainment	**2.20**	**2.37**	**2.33**	**2.22**	**2.1**	**2.35**	**2.74**	**2.66**	**2.54**	**2.52**	**2.51**	**2.35**	**2.58**	**2.53**
Average Target level from Table-5	**2.6**	**2.6**	**2.4**	**2.8**	**2**	**1.8**	**1**	**1**	**1**	**2.6**	**2.8**	**2.6**	**3**	**3**
Gap	**-0.4**	**-0.23**	**-0.07**	**-0.58**	**0.1**	**0.55**	**1.74**	**1.66**	**1.54**	**-0.08**	**-0.29**	**-0.25**	**-0.42**	**-0.47**

- Finally, overall PO attainment values in **Table 13** are computed by adding direct and indirect PO attainment values in the **proportion of 80:20 [Overall attainment ofPO-1 :{(2.18x0.8) + (2.25x0.2)} = 2.20]** respectively.
- The computed values are compared with the set target values of POs. The target values are set in consultation with the members of departmental BoS along with the faculty members of the program. It is argued that the target PO attainment value for each PO must be different since the contribution of courses for PO attainment is different. Accordingly, each PO was set with different target value as shown in the last row of Table-12. It is found from the table that all the POs are attained. An action plan for POs that do not reach the target attainment (Gap Level) value must be designed and implemented in the subsequent academic years.
- **Attainment of POs will be calculated session wise for example Session 2018-19 (First year to Final year for particular department), Session 2017-18 (First year to Final Year); similarly we can calculate for other sessions also as per requirement.**

8. Attainment of Program Education Objectives (PEOs)

- Programme educational objectives are broad statements that describe the career and professional accomplishments that the programme is preparing graduates to achieve. The PEOs should be consistent with the mission of the institution. The department shall provide the required information for assessment, evaluation and review methods to evaluate the attainment of the PEOs.
- Pos/PSOs will be mapped with PEOs for calculation of attainment of PEOs. **Table 14** shows the mapping of PEOs with POs & **Table 15** Shows the attained level of PEOs (2.20x3/3 & for next 2.20x2/3, similarly we can calculate).

Table-14(Target Level Expected for Program Educational Objectives) [PEOs]

PO	PO Level Attained	PEO (Mapping)				
		PEO-1	PEO-2	PEO-3	PEO-4	PEO-5
PO-1	2.20	3	2	2	2	3
PO-2	2.37	3	2	3	2	3
PO-3	2.33	3	1	2	2	3
PO-4	2.22	3	1	2	2	2
PO-5	2.1	2	1	2	2	3
PO-6	2.35	2	2	3	2	3
PO-7	2.74	1	3	2	1	2
PO-8	2.66	1	3	1	1	2
PO-9	2.54	2	3	2	2	2
PO-10	2.52	2	3	2	3	2
PO-11	2.51	2	3	2	2	3
PO-12	2.35	3	3	3	2	2
PSO 1	2.58	2	2	2	2	2
PSO 2	2.53	2	2	2	2	2
Target Level (AVERAGE)		2.21	2.25	2.17	2.5	2.75

9. Attainment of Mission of the Department

- 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 programme of instruction, practical experience, and opportunities for overall personality development.
- Mission of the department will be mapped with PEOs. Table 16 shows the mapping of PEOs with mission of the department.

Table-15 Attainment Program Educational Objectives [PEO]					
PO	**Program Educational Objectives PEO**				
	PEO-1	**PEO-2**	**PEO-3**	**PEO-4**	**PEO-5**
PO-1	2.20	1.47	1.48	1.48	2.20
PO-2	2.37	1.60	2.4	1.6	2.37
PO-3	2.33	0.77	1.55	1.55	2.33
PO-4	2.22	0.74	1.48	1.48	1.48
PO-5	1.4	0.7	1.4	1.4	2.1
PO-6	1.57	1.57	2.2	1.57	2.2
PO-7	0.91	2.74	1.82	0.91	1.82
PO-8	0.88	2.66	0.88	0.88	1.77
PO-9	1.69	2.54	1.69	1.69	1.69
PO-10	1.68	2.52	1.68	2.52	1.68
PO-11	1.67	2.51	1.67	1.67	2.51
PO-12	2.35	2.35	2.35	1.57	1.57
PSO - 1	1.72	1.72	1.72	1.72	1.72
PSO - 2	1.68	1.68	1.68	1.68	1.68
Attained Level	1.77	1.84	1.72	1.53	1.98
Target Level	**2.21**	**2.25**	**2.17**	**2.5**	**2.75**
Gap	**-0.44**	**-0.41**	**-0.45**	**-0.97**	**-0.77**

Table-16 Mapping of PEO with Mission					
PEOs / Mission	**PEO Level Attained**	**M1**	**M2**	**M3**	**M4**
PEO 1	1.77	3	2	2	3
PEO 2	1.84	2	3	2	2
PEO 3	1.72	3	2	2	2
PEO 4	1.53	3	2	3	3
PEO 5	1.98	2	3	3	3
Target Level Average		**2.6**	**2.4**	**2.4**	**2.6**

Table17: Attainment of Mission				
PEOs / Mission	**M1**	**M2**	**M3**	**M4**
PEO 1	1.77	1.18	1.18	1.77
PEO 2	1.22	1.84	1.22	1.22
PEO 3	1.72	1.15	1.15	1.15
PEO 4	1.53	1.00	1.53	1.53
PEO 5	1.32	1.98	1.98	1.98
Average Attainment	**1.51**	**1.43**	**1.41**	**1.53**
Target Level	2.6	2.4	2.4	2.6
Gap	**-1.09**	**-0.97**	**-0.99**	**-1.07**

9.1 Action for Gap Fulfilment

Department will call Departmental BoS meeting to discuss how these GAPs can be fulfilled. However these are some suggestions to the departments to fulfil these gaps:-

- Remedial Classes for weak students arranged to improve the attainment level.
- Beyond syllabus topics added to meet the requirement.
- Industry visit/Industrial Expert talk/Senior academic talks can be arranged for the students.
- Project development for students in each year which map syllabus.
- Report on Gap Fulfilment:- Gap analysis will be done in at the end of each semester, gap analysis of odd semester will be done in next even semester, the action for gap fulfilment will be decided & will be implemented in next odd semester. Similarly applicable for even semester also
- If the achieved Bloom's knowledge level is more than 40% weightage for knowledge oriented questions (as mentioned in para 6 for bloom's) then POs can't be calculated and we have to restructure the question paper accordingly.

10. Other Components of NBA SAR

10.1 Programme Curriculum

Programme curriculum that leads to the attainment of the PEOs and the POs must be designed. The programme shall provide how its curriculum is designed, published, and disseminated. The structure of the curriculum, which comprises course code, course title, total number of contact hours (lecture, tutorial and practical) and credits is to be provided. Flow diagram that shows the prerequisites for the courses shall also be provided.

Each programme should cover general and specialised professional content of adequate breadth and depth, and should include appropriate components in the Sciences and Humanities. The relevance of curriculum components including core professional courses to the POs shall be given.

The institute shall describe how the core professional courses in the curriculum lend the learning experience with the complex problems. In addition to the General Criteria, each programme must satisfy a set of criteria specific to it, known as Programme Specific Criteria which deal with the requirements for professional practice particular to the related sub-discipline.

The institution shall provide evidence that the programme curriculum satisfies the programme specific criteria, and industry interactions/internship. The institution must ensure that the programme curriculum that was developed at the time of inception of the programme has been refined in the subsequent years to make it consistent with the PEOs and the POs.

The institute shall provide the required information for assessment, evaluation and review methods to evaluate the attainment of COs.

10.2 Students' Performance

I. Students admitted to the programme must be of a quality that will enable them to achieve the programme outcomes. The policies and procedures for student admission and transfer should be transparent and spelt out clearly.

II. The educational institution should monitor the academic performance of its students carefully. The requirements of the programme should be made known to every student.

III. The educational institution must provide student support services including counselling /tutoring/mentoring.

IV. The institute shall provide the required information for three complete academic years for admission intake in the programme, success rate, academic performance, placement and higher studies and professional activities as per the format given in the SAR. However, it shall provide the information in a suitable format, wherever necessary, in case the format is not provided in the SAR.

10.3 Faculty Contribution

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

II. 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.

III. 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 programme, it is essential to have adequate levels of teacher-student interaction, which is possible only if there are enough teachers, or in this case, faculty members.

IV. The faculty must be actively involved in research and development. The programme must support, encourage and maintain such R&D activities. A vibrant research and development culture is important to any academic programme. It provides new knowledge to the curriculum. The student's education is enriched by being part of such a culture, for it cultivates skills and habits for lifelong learning and knowledge on contemporary issues.

V. The academic freedom to steer and run the programme will be in the hands of members of the faculty. This includes the rights over evaluation and assessment processes and decisions on programme involvement. They should also eng age themselves in the process of accreditation for the continuous improvement of the PEOs and the POs.

VI. The faculty must have sound educational qualifications, and must be actively updating knowledge in their respective areas of interest. It is desirable that the members of the faculty possess adequate industrial experience and be from diverse backgrounds. In terms of teaching, the faculty must possess experience, be able to communicate effectively, and be enthusiastic

about programme improvement. For courses relating to design, the faculty members in charge of the course must have good design experience and participate in professional societies.

VII. The institute shall provide the required information for three complete academic years as per the format given in the SAR. However, it shall provide the information in a suitable format, wherever necessary, in case the format is not provided in the SAR.

10.4 Facilities and Technical Support

I. The institution must provide adequate infrastructural facilities to support the achievement of the programme 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. Modern teaching aids such as digital interactive boards, multimedia projectors etc., should be in place to facilitate the teaching-learning process so that programme outcomes of the programme can be achieved.

II. The laboratories must be equipped with computing resources, equipments, and tools relevant to the programme. The equipments of the laboratories should be properly maintained, upgraded and utilised so that the students can attain the programme outcomes. There should be an adequate number of qualified technical supporting staff to provide appropriate guidance for 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.

III. The institute shall provide the required information for class rooms in the department, faculty rooms in the department, laboratories in the department to meet the curriculum requirements as well as the POs, and technical manpower in the department as per the format given in the SAR. However, it shall provide the information in a suitable format wherever necessary in case the format is not provided in the SAR.

10.5 Academic Support Units and Teaching - Learning Process

I. The programme must employ effective teaching-learning processes. The modes of teaching used, such as lecture, tutorial, seminar, teacher-student interaction outside class, peergroup discussion, or a combination of two or more of these, must be designed and implemented so as to facilitate and encourage learning. Practical skills, such as the ability to operate computers and other technologically advanced machinery, must be developed through hands-on laboratory work.

II. The effectiveness of the teaching-learning processes must be evaluated on a regular basis. The evaluation, besides reviewing the abovementioned factors, must also look at whether the academic calendar, the number of instructional days and contact hours per week, are maximally conducive to teaching and learning. Student feedback on various aspects of the process must be carefully considered as well. Internal reviews of quality assurance procedures should be carried out periodically.

III. The institute shall provide the required information for complete three academic years as per the format given in the SAR. However, it shall provide the information in a suitable format, wherever necessary, in case the format is not provided in the SAR.

10.6 Governance, Institutional Support and Financial Resources

I. The governance structure of the programme must clearly assign authority and responsibility for the formulation and implementation of policies that enable the programme to fulfill its mission. The programme must possess the financial resources necessary to fulfill 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 programme's budgetary planning process must also provide for the acquisition, repair, maintenance and replacement of physical facilities and equipment.

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

III. The institute shall provide the required information for campus infrastructure and facility, organisation, governance and transparency, budget allocation and public accounting (for both institutions and programme), library, internet, safety norms and checks, and counselling and emergency medical care and first-aid as per the format given in the SAR. However, it shall provide the information in a suitable format, wherever necessary, in case the format is not provided in the SAR.

10.7 Continuous Improvement

I. Modifications in the programme curriculum, course delivery and assessment brought in from the review of the attainment of the PEOs and the POs, will be helpful to the institutions for continuous improvement. The programme must develop a documented process for the periodic review of the PEOs, the POs and the COs. The continuous improvement in the PEOs and the POs need to be validated with proper documentation.

II. The institute shall provide the required information for continuous improvement for three consecutive academic year's e as per the format given in the SAR. However, it shall provide the information in a suitable format, wherever necessary, in case the format is not provided in the SAR.

Self-Assessment Report Refer to individual manual for different disciplines/programmes for format of Self Assessment Report. The SAR should be as comprehensive as possible not deviating from the format given along with the supporting documents. The information furnished by the institution should provide a scope to allow an assessment of the qualitative as well as quantitative positioning of the Institution in relation to each criterion as specified in the individual manual.

Annexure - 1

CURRICULUM FEEDBACK FORM

Form to be used for Indirect Method Calculation (NBA Manual Para 7.13. Table 12).
Feedback will be taken in each semester at the end before CT-3 by all Departments.
To be filled by all Students

Program Name: (……)

Department: …… **Date:** …….

Name: …….. **Semester:** (……...)

This questionnaire is intended to collect information relating to your satisfaction towards the curriculum. This information provided by you will be used as important feedback for quality improvement of the curriculum.

Directions: For each question please indicate your degree of satisfaction with the following statement by choosing a ✓ score between 1 and 5.

Strongly Disagree	**1**
Disagree	**2**
Neither agree nor Disagree	**3**
Agree	**4**
Strongly Agree	**5**

Sl.No.	Curriculum Evaluation	1	2	3	4	5
1	Syllabus is suitable to the course					
2	Aims and objectives of the syllabi are well defined and clear to teachers and students					
3	Course content is followed by corresponding reference materials.					
4	The syllabus has good balance between theory and application.					
5	The syllabus has made me interested in the subject area.					
6	The syllabus covers Modern/Advanced topics.					
7	Syllabus is Industry Oriented.					
8	Learning value(In terms of Skills, Concepts, Knowledge, Analytical Abilities, or Broadening Perspectives)					
9	Applicability (Applicable in real life)					
10	Helps going for Higher Studies					

Your Opinion/Suggestion for improvement in contents of syllabus:

……

……

……

……

Signature of the Student

Annexure - 2

GRADUATING STUDENT EXIT SURVEY

Form to be used for Indirect Method Calculation (NBA Manual Para 7.13. Table 12).
Feedback will be taken in each semester at the end before CT-3 by all Departments.
To be filled by Final year Students

Department of ……

Congratulations for becoming a soon-to-be graduate of our Institute. The faculty and administration of the Institute wishes you all the success in your career ahead. Your feedback is important to us and will be used for enhancing the quality of the educational experience of other students that will follow you. Please take sufficient time to reflect on your experience and provide thoughtful answers to the questions. Thank you for your participation.

1. Personal Information:

Name: …….. **Roll No.: …….**

E-Mail ID: …… **Mobile No: ……**

2. Professional Information:

Placed at (Company Name)			
GATE	**Attempted (Yes/No)**	**Rank :**	**Score :**
CAT	**Attempted (Yes/No)**	**Rank:**	**Score:**
GRE	**Attempted(Yes/No)**	**Rank:**	**Score:**
Any Other	**Attempted(Yes/No)**	**Rank:**	**Score:**

To what extent did the courses in your curriculum contribute to your competence in the following areas?	**Poor (1mark)**	**Satisfactory (2 marks)**	**Good (3 marks)**	**V Good (4 marks)**	**Excellent (5 Marks)**
1. Applying the knowledge of Mathematics, Science, and Engineering fundamentals and engineering specialization to solution of complex engineering problems					
2. Identifying, formulating, researching the literature, and analyzing complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences					
3. Design of solutions for complex engineering problems and design of system components or processes that meet the specified needs with appropriate considerations of public health and safety, and cultural, societal, and environmental considerations					
4. Use research based methods including design of experiments, analysis and interpretation of data and synthesis of information leading to logical conclusions					

5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling complex engineering activities with an understanding of limitations					
6. Apply reasoning within the contextual knowledge to access societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice					
7. Understand the impact of the professional engineering solutions in the societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable developments					
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice					
9. Function effectively as an individual independently and as a member or leader in diverse teams, and in multidisciplinary settings					
10. 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 oral presentations, and give and receive clear instructions					
11. Demonstrate knowledge and understanding of engineering management principles and apply those to one's own work as a member and leader of a team to manage projects in multidisciplinary environments					
12. Recognize the need for, have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change					

Signature of the Student

Annexure - 3

ALUMNI SURVEY FORM

Form to be used in Finalization of PEOs (Para 3, NBA manual)
Feedback will be taken in routine or at the time of Alumni Meet (Around 100 per year)
To be filled by Alumni

1. Name: ……. **2. Branch: ……..**

3. Passing Year: ……. **4. Mobile No: ……**

5. E-Mail ID: …….. **6. Name of the Organization: …….**

7. Type of organization (Tick if Any): ……..

(a.) S/W, Development: ☐ **(b.) IT Services:** ☐ **(c.) Consulting Services:** ☐

(d.) Research and Development: ☐ **(e) Marketing Industry:** ☐ **(f) Core Industry:** ☐

(g.) Any other (please specify): .....

8. List the name of the companies where you have worked:

S. No.	Organization	Duration		Teaching/Industries Experience	Package Per Annum
		From	To		
1					
2					
3					

9. Industry expectations from student:

Technology: .....

Platform : .....

Others : .....

10. How do you rate yourself on following attributes on a scale of 1 to 5 with 1 being lowest and 5 Highest (Tick √)?

Attribute	1	2	3	4	5
Initiative and ambition					
Teamwork					
Ability to solve problems					
Ability to communicate					
Desire to learn more and upgrade skills					

11. Did your education during B. Tech give you sufficient understanding of the importance of the skills mentioned & fundamental in 4 and the desire to improve them? (Yes / No)

12. Please share any other observations from your educational/industrial experience for the improvement of our department.

Date: **Signature**

Annexure – 4(A)

EMPLOYER SURVEY FORM (ENGINEERING & MCA STUDENTS)

Form to be used in Finalization of PEOs (Para 3, NBA manual)
Feedback will be taken in routine (Around 50 per year)
To be filled by Employers of our students

The information contained in this report is meant purely for the use at this Institute for reviewing the academic processes so as to enhance the quality of imparted education. It should not be linked with the performance assessment of the employee.
It is requested to kindly assess the attributes of the employer named below and return this report duly filled-in to this Institute. Assessment be made by ticking the appropriate box. A prompt response will be highly appreciated.

Name of Employee: **Date:**

Employee ID:

Company Name:

S. No.	ATTRIBUTES	Poor (1)	Satisfactory (2)	Good (3)	V Good (4)	Excellent (5)
1	Ability to identify and analyze engineering problems.					
2	Ability to apply knowledge of science and engineering in solving engineering problems.					
3	Ability to design solutions to engineering problems.					
4	Ability to use engineering techniques, test equipment and tools including hardware and software for solving engineering problems.					
5	Level of concern displayed for societal health, safety and cultural issues whilst working on engineering problems.					
6	Level of concern displayed for environmental safety and sustainability whilst working on engineering problems.					
7	Level of adherence to personal and professional ethics whilst working on engineering problems.					
8	Ability to provide solutions in engineering problems individually and as a member of the team.					
9	Ability to communicate effectively both verbal as well as written.					
10	Ability to apply project management skills whilst working an engineering solutions.					
11	Ability to upgrade continuously and apply engineering knowledge to provide solutions on his/her own.					

Name and Designation:.....
Company Name:.....

Annexure – 4(B)

EMPLOYER FEEDBACK FORM (MBA)

Form to be used in Finalization of PEOs (Para 3, NBA manual)
Feedback will be taken in routine (Around 50 per year)
To be filled by Employers of our students

Dear Esteemed Employer,

We extend our heartiest thanks on behalf of KIET Group of Institutions for giving our alumni an opportunity to work with your prestigious Company/Organization.

We shall very much appreciate and be grateful to you if you can spare some of your valuable time to fill up this feedback form. It will help us to improve the quality of education and training and also help us to identify the gaps that exist between the course curriculum and industry expectations.

Tick the number that best describes your level of satisfaction at each question**: 1-Extremely unsatisfied, 2 - unsatisfied, 3 – meets expectation, 4 - satisfied, 5 – extremely satisfied.**

Q1. How satisfied are you with the student/s work performance in each of these areas:

S.No.	Particulars	1	2	3	4	5
1.	General communication skills					
2	Problem solving at workplace					
3.	Team Orientation					
4	Technical Knowledge					
5	Proactiveness and self-motivated					
6	Creativeness and out of the box thinking					
7	Planning and Organizing skills					
8	Eagerness to learn and take responsibility					
9	Relationship with seniors/peers/subordinates					
10	Leadership skills exhibited					

Q2. On a scale of 1 to 10 how do you rate your overall satisfaction with the performance of KIET alumni?

1 being extremely unsatisfactory performance and 10 being a stellar performance.

…….....

.....

Q3. If you were dissatisfied with any aspect, please comment.

…….....

.....

Q4. Suggestions for further improvement of the programme.

.....

…….....

We, at KIET School of Management, KIET Group of Institutions, thank you again for filling this form and giving your valuable insight. With this feedback, we shall endeavour for constant improvement of quality of education.

Name:

Organization:

Designation:

Date:

Signature

Name of the alumni of KIET working with your organization:

This Form can be scanned/e-mailed/post-mailed to the sender.

Postal Address:

Head of the Department

KIET School of Management

KIET Group of Institutions

Ghaziabad - Meerut Road

NH-58, Ghaziabad-201206

Annexure – 4(C)

FEEDBACK FORM FOR EMPLOYERS

Dear employers,

As industry is the ultimate customer of Pharma Graduates, its satisfaction about standards and content of KIET products is important. KIET School of Pharmacy always maintains a continuous dialogue with industry and modify the curricula accordingly. As the ultimate beneficiary of our quality product your support and feedback will help us to maintain the required standards of education.

Name of the Company/Institute: .....

Name of the evaluating person with Designation: .....

Present Postal address: .....

ZIP/PIN: ..... Phone No. ..... Fax: .....

Mobile No: ..... Email id: .....

Here are some of the points to facilitate you in giving feedback about our students. You are requested to give marks in the box provided against each item as per the following norms:

EXCELLENT-3 **SATISFACTORY-2** **POOR-1**

Sr. No.	CRITERIA	RATINGS		
		1	2	3
1	Performance against Goal Setting/ Job knowledge / Competency			
2	Problem Solving/ Negotiation Skill			
3	Administration Skill/ Decision Making			
4	Technical Knowledge/ computational skills			
5	Intelligence quotient and Emotional quotient			
6	Growth and Developments Orientation			
7	Integrity/ Commitment			
8	Interpersonal Skill/ Communication/ Team Work			
9	Ability to Motivate/ Leadership			
10	Reliability/ Punctuality			
11	Innovation/ Ability to contribute to the goal of the organization			

Any other suggestion/ comment(s):		
Would you like to recruit more KSOP student?	**Yes**	**No**
Would you refer us to other organization(s)?	**Yes**	**No**
If yes, Suggest:		

Signature

Date:

Annexure – 5

SOCIETY OPINION

Form to be used in Finalization of PEOs (Para 3, NBA manual)
Feedback will be taken in routine (Around 100 per year)
To be filled by Society Person

Program Name: B.Tech (Branch.....)

This opinion is intended to collect information regarding your satisfaction towards the Vision, Mission and Programme Educational Objectives of the above said program. This information provided by you will be used as an important feedback for quality improvement of the course.

For each question please indicate your degree of satisfaction with the following statement by choosing a ✓ score between 1 and 5.Please write your opinion if the score for any point is less than 3.

(1- Strongly Disagree, 2 – Disagree, 3 – Neither agree nor Disagree, 4 – Agree, 5 – Strongly Agree)

S.N	Program Evaluation	1	2	3	4	5
1.	The department has the following vision and putting efforts accordingly, please indicate your satisfaction level from the department's Vision and you can also mention the points that you want to see in the vision of our department. **Department Vision** To achieve excellence in imparting education in the field of .....by creating competent professionals for Industry & Socio-economic development to meet National and International needs. ……..... …… ……					
2.	The department has the following mission and putting efforts accordingly, please indicate your satisfaction level from the department's Mission and you can also mention the points that you want to see in the mission of our department. **Department Mission** To provide students with supportive environment that facilitates learning to solve the problems in the field of electrical and electronics engineering and to prepare them to be successful and ethical human beings as well as professionals as they move to industry, academia and other professions. ……. ……. …….					
3.	I would like to see the following capabilities in the student after the completion of his/her degree. Student must be able to understand mathematical, scientific, electrical and electronics engineering concepts necessary to formulate, analyze and solve engineering problems faced by society. ……..					

	Student must be able to communicate effectively, work harmoniously in teams with professional ethics and has learned to adopt an integrated approach to problems in the field of .....by using latest and advanced technology tools. …….					
	Student has broad understanding of the engineering and management principles and can apply the acquired knowledge in solving complex and multidisciplinary engineering problems. …….					
	Student is equipped with the knowledge to design and develop engineering solutions to the problems faced by society for its sustainable development with the help of environment friendly technologies ……					
	Student has inculcated the ability to explore and learn by himself/herself, the changes taking place continuously in the field of engineering and technology as part of lifelong learning process. …….					

Any other suggestions:

……
……
……...
……
……

Name :

Designation:

(Signature)

Date:

Place:

Annexure – 6

PARENTS OPINION

Form to be used in Finalization of PEOs (Para 3, NBA manual)
Feedback will be taken in routine (Around 100 per year)

Program Name: B.Tech (Branch.....)

This opinion is intended to collect information regarding your satisfaction towards the Vision, Mission and Programme Educational Objectives of the above said program. This information provided by you will be used as an important feedback for quality improvement of the course.

For each question please indicate your degree of satisfaction with the following statement by choosing a √ score between 1 and 5. Please write your opinion if the score for any point is less than 3.

(1- Strongly Disagree, 2 – Disagree, 3 – Neither agree nor Disagree, 4 – Agree, 5 – Strongly Agree)

S.N	Program Evaluation	1	2	3	4	5
1.	The department has the following vision and putting efforts accordingly, please indicate your degree of satisfaction. **Department Vision** To achieve excellence in imparting education in the field of .....by creating competent professionals for Industry & Socio-economic development to meet National and International needs. ……..... ……					
2.	The department has the following mission and putting efforts accordingly, please indicate your degree satisfaction. **Department Mission** To provide students with supportive environment that facilitates learning to solve the problems in the field of ……..and to prepare them to be successful and ethical human beings as well as professionals as they move to industry, academia and other professions. …… …….					
3.	I would like to see the following capabilities in the student after the completion of his/her degree. Student must be able to understand mathematical, scientific, electrical and electronics engineering concepts necessary to formulate, analyze and solve engineering problems faced by society. ……..					
	I would like to see the following capabilities in my ward after the completion of his/her degree. Student must be able to understand mathematical, scientific, concepts necessary to formulate, analyze and solve engineering problems faced by society. …….					
	Student has broad understanding of the engineering and management principles and can apply the acquired knowledge in solving complex and multidisciplinary engineering problems. …….					

	Student is equipped with the knowledge to design and develop engineering solutions to the problems faced by society for its sustainable development with the help of environment friendly technologies ……					
	Student has inculcated the ability to explore and learn by himself/herself, the changes taking place continuously in the field of engineering and technology as part of lifelong learning process. …….					
4.	The program's syllabus has good balance between theory and application. …….					
5.	The program's syllabus has made as per interest of current industrial and professional requirements. …….					
6.	The program's syllabus covers Modern/Advanced topics and meet national and international criterion. ……..					
7.	Help is been provided for Higher Studies. ……..					

Any other suggestions:

……
……
……...
……
……

Name :

Designation:

(Signature)

Date:

Annexure – 7

INDUSTRY PERSON OPINION SURVEY

Form to be used in Finalization of PEOs (Para 3, NBA Manual)
Feedback will be taken in routine (Around 100 per year)
To be filled by Industry Persons.

Program Name: B.Tech (Branch.....)

This opinion is intended to collect information regarding your satisfaction towards the Vision, Mission and Programme Educational Objectives of the above said program. This information provided by you will be used as an important feedback for quality improvement of the course.

For each question please indicate your degree of satisfaction with the following statement by choosing a ✓ score between 1 and 5.Please write your opinion if the score for any point is less than 3.

(1- Strongly Disagree, 2 – Disagree, 3 – Neither agree nor Disagree, 4 – Agree, 5 – Strongly Agree)

S.N	Program Evaluation	1	2	3	4	5
1.	The department has the following vision and putting efforts accordingly, please indicate your satisfaction level from the department's Vision and you can also mention the points that you want to see in the vision of our department. **Department Vision** To achieve excellence in imparting education in the field of .....by creating competent professionals for Industry & Socio-economic development to meet National and International needs. ……..... …… ……					
2.	The department has the following mission and putting efforts accordingly, please indicate your satisfaction level from the department's Mission and you can also mention the points that you want to see in the mission of our department. **Department Mission** To provide students with supportive environment that facilitates learning to solve the problems in the field of electrical and electronics engineering and to prepare them to be successful and ethical human beings as well as professionals as they move to industry, academia and other professions. …… ……					
3.	I would like to see the following capabilities in the student after the completion of his/her degree. She/He must be able to understand mathematical, scientific, ……concepts necessary to formulate, analyze and solve engineering problems faced by society. ……..					

	She/He must be able to communicate effectively, work harmoniously in teams with professional ethics and has learned to adopt an integrated approach to problems in the field of .....by using latest and advanced technology tools. …….					
	She/He has broad understanding of the engineering and management principles and can apply the acquired knowledge in solving complex and multidisciplinary engineering problems. …….					
	She/He is equipped with the knowledge to design and develop engineering solutions to the problems faced by society for its sustainable development with the help of environment friendly technologies ……					
	Student has inculcated the ability to explore and learn by himself/herself, the changes taking place continuously in the field of engineering and technology as part of lifelong learning process. …….					
4.	The students would meet current industrial and professional requirements. …….					
5.	The student has knowledge of Modern/Advanced topics and meet National and International criterion. ……					

Any other suggestions:

……
……
……...
……
……

Name :

Designation:

(Signature)

Date:

Place:

(Name of the Department)

Name of the Course, Nth Semester

CT-1 Examination, (2018-19) Odd Semester

(Subject Name) (Subject Code)

Duration: 2 Hrs. **Max.Marks: 60**

Note: - Attempt All the Questions of All the Sections.

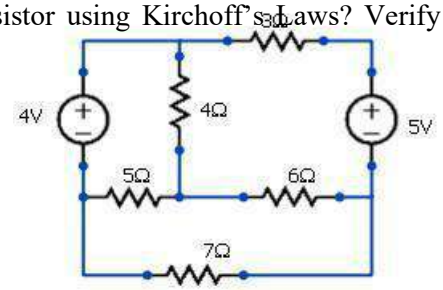
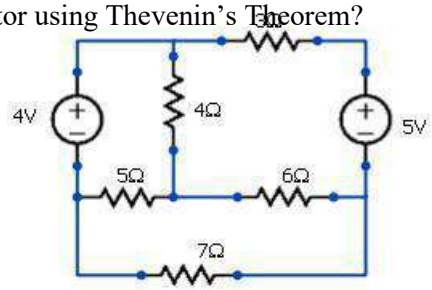
Section-A			(2X10=20)		
Q. No.		**Question**	**Marks**	**CO**	**BL**
1.	**a**				
	b				
	c				
	d				
	e				
	f				
	g				
	h				
	i				
	j				

Section-B		(5X4=20)		
Q. No.	**Question**	**Marks**	**CO**	**BL**
2	*******			
	OR			
	********			
3	*******			
	OR			
	********			
4	*******			
	OR			
	********			
5	*******			
	OR			
	********			

Section-C		(10X2=20)		
Q. No.	**Question**	**Marks**	**CO**	**BL**
6	*******			
	OR			
	********			
7	*******			
	OR			
	********			

- **CO -Course Outcome generally refers to traits, knowledge, skill set that a student obtains after completing the course successfully.**
- **Bloom's Level (BL) - Bloom's taxonomy framework is planning and designing of assessment of student learning**

Sample Questions

Section-B				
Q. No.	**Question**	**Marks**	**CO**	**BL**
2	Calculate current through 4 Ω resistor using Kirchoff's Laws? Verify the same using Superposition Theorem. 	5	1	BL-3
	OR			
	Calculate current through 4 Ω resistor using Thevenin's Theorem? 			

Section-B				
Q. No.	**Question**	**Marks**	**CO**	**BL**
2	Explain the steps involved in solving a problem using computer.	5	1	BL-2
	OR			
	Compare the working of three looping constructs of C language giving their syntax.			

Annexure
Suggestions on OBE Manual KIET Group of Institutions

S. No.	Suggestion	Remarks	Page Number
Suggestions by Dr S K Garg, Pro VC, Delhi Technological University			
1.	**Target level in PEO is very high in mapping of PEO to Mission.** Departments are following the same exercise as suggested. In our manual the values given are considered for example to learn the methodology.	Implemented	14
2.	**Formation of COs on the basis of bloom's taxonomy learning levels.** Suggestion is well taken and incorporated in our OBE manual; all the departments are suggested to implement the same guidelines. Bloom's taxonomy will be taken into consideration for forming the COs of each subject in all the departments.	Implemented	20
3.	**Inclusion of syllabus feedback as indirect method for calculation of Course wise attainment** We consider it as indirect attainment methods calculations on KIET ERP NBA Module. For further improvements, we will implement as suggested by you. (Table – 12)	Under Implementation	35
Suggestions by Dr. N C Shivaprakash, Indian Institute of Science Bangalore			
4.	**Page 20: It is NOT necessary to write one CO for each unit. It could be 5 COs and left to the course instructor to decide depending on the type of courses. For example a core design course an instructor may like higher Bloom levels and thereby could consider giving more than ONE COs in a given Unit.** Suggestion is well taken and incorporated in our OBE manual; all the departments are suggested to implement the same guidelines. Bloom's taxonomy will be taken into consideration for forming the COs of each subject in all the departments.	Implemented	20
5.	**Page 34: Direct/Indirect assessment: I noticed that the attainment is high in indirect assessment. This is the reason why weight age for indirect assessment is kept 20 % and gave more weight age for direct assessment (80%). You are thinking of 70 - 30 model, please reconsider.** Already we are following the same exercise in the entire department & accordingly all the calculations done on our ERP software for NBA. Same guidelines are already given in our OBE manual on page number 20.	Implemented	20
6.	**Page 26: PO 6 target is 1.8: PO6 is Engineers and Society: I expect lots of Project work could be on this and target may go up. Also seminars could be on PO6. There may NOT be any course but curricular and co-curricular activities could be mapped.** Dear sir, all the values considered in our OBE manual are taken for example to understand the methodology of calculation. Suggestion is well considered and will be adopted well by the departments.	Implemented	26
7.	**In students feedback I saw ONLY on curriculum but it is advised to take the feedback on teacher also. It is good to take 2 feedbacks one in the half way and one at the end.** We are taken the feedback of faculty members from students through ERP software regularly. As per your suggestions, we will make certain changes in the calculation on ERP software for indirect attainment methods of NBA in future.	Under Implementation	35
8.	**The challenge for you is that you to have make every faculty to feel and understand OBE.** In 2014, the OBE was introduced by NBA which follows Washington Accord. In our college, our faculty members attend workshops & seminars about OBE regularly.	Implemented	--

Suggestions given by Dr. Onkar Singh, Harcourt Butler Technical University, Kanpur			
9.	**Add details of Program Specific Outcome (PSO).** In our OBE manual all the departments are instructed to form their PSOs and all are following also. Thanks for suggesting.	Implemented	16
10.	**It will not be possible in all cases to have exclusive CO for each unit. So remove the restriction to have one CO from each unit. Better is to prescribe 5 COs without any qualifier.** Suggestion is well taken and incorporated in our OBE manual; all the departments are suggested to implement the same guidelines. Bloom's taxonomy will be taken into consideration for forming the COs of each subject in all the departments.	Implemented	20
11.	**Approving authority for COs should be Department BOS and not any individual (HOD).** In our institute all the departments are having their own BOS and all the responsibilities like finalization of COs, PSOs, PEOs and faculty load is performed by department BoS in consultation with HoD.	Implemented	20
12.	**Page - 25 - COs should have measurable words in their statements. Also, the statements should be realistic and attainable in the specific context of the course at the respective Institution.** We are following the same exercise in our college. But your suggestion is valuable for us. The point has been noted and the action will be taken accordingly.	Implemented	20
13.	**Page 26- In the mapping matrix, it will be better to give the mathematical relationship used to arrive at different estimates of target levels.** Dear sir all the calculations are done with the help of mathematical relations in our OBE manual & same relations are used for attainments on our ERP software of NBA. We will more clearly define all the mathematical relations in our OBE manual.	Implemented	30
14.	**Page 30 - The CO Wise attainment level calculation is OK but the way of expressing it may be relooked. (Suggested: Obtained Y /Maximum Y) Similarly, Overall % attainment level may also be expressed suitably. The last column of the table be provided with a caption.** Implemented.	Implemented	30
15.	**Online feedback collection should be brought into practice instead of a hard copy where the signature is required.** All the feedback system like faculty feedback, curriculum feedback survey & graduate exit survey are handled on our ERP software.	Implemented	35
16.	**The mechanism for handling the feedback needs to be spelled out for realizing the purpose of this exercise to improve.** Sir, we already has the mechanism for feedback and followed accordingly.	Implemented	35
17.	**Careful reading will help in improving the text. At certain places, the corrections are required.** We have gone through and updated it.	Implemented	--
18.	**The institution may think of a better name for this document dealing with outcome-based education, say for example ' OBE Manual'……** Thanks for giving us so many good suggestions and we will now change its name from NBA manual to OBE manual KIET Group of Institutions.	Implemented	1
19.	**The web-based application developed by the Institution should be used for evaluating the attainments else faculty will be overburdened with the manual calculations.** We have our own In-house developed ERP software module for NBA which follows all the calculations & attainments required for attainments of COs, POs & PEOs.	Implemented	--

KIET GROUP OF INSTITUTIONS

YADUVIR SINGH <yaduvir.singh@kiet.edu>

NBA Meeting 26/04/2020 (with Dr S K Garg)

1 message

YADUVIR SINGH <yaduvir.singh@kiet.edu> Mon, Apr 27, 2020 at 11:14 AM
To: ANIL AHLAWAT <anil.ahlawat@kiet.edu>

1. Target level in PEO mapping to Mission.
2. Formation of COs on the basis of bloom's taxonomy learning levels.
3. Inclusion of syllabus feedback as indirect method for calculation of Course wise attainment.

Warm Regards

www.kiet.edu

KIET Group of Institutions

Delhi-NCR, Meerut Road (NH-58)
Ghaziabad - 201206

YADUVIR SINGH

ASSOCIATE PROFESSOR

Department of Electrical & Electronics Engineering

Mob.: +91 9899319491, +91 9873394917

Shaping Young Minds with Skill Oriented & Value Based Education.

Please do not print this email unless it is absolutely necessary.

KIET GROUP OF INSTITUTIONS

YADUVIR SINGH <yaduvir.singh@kiet.edu>

Fwd: Draft NBA Manual_ KIET Group of Institutions: Seeking your suggestions

1 message

ANIL AHLAWAT <anil.ahlawat@kiet.edu> Sat, May 16, 2020 at 3:50 PM
To: YADUVIR SINGH <yaduvir.singh@kiet.edu>

---------- Forwarded message ---------
From: **Amik k Garg** <amik.garg@kiet.edu>
Date: Sat, May 16, 2020, 1:08 PM
Subject: Re: Draft NBA Manual_ KIET Group of Institutions: Seeking your suggestions
To: DIRECTOR KIET <director@kiet.edu>, DIRECTOR OFFICE <directoroffice@kiet.edu>
Cc: ANIL AHLAWAT <anil.ahlawat@kiet.edu>

Pl share with Dean A.

On Sat, 16 May 2020, 12:47 DIRECTOR KIET, <director@kiet.edu> wrote:

> Sir
> Kindly see
>
> ---------- Forwarded message ----------
> From: **Dr N C Shivaprakash** <shivaprakashiisc@gmail.com>
> Date: Saturday, May 16, 2020
> Subject: Draft NBA Manual_ KIET Group of Institutions: Seeking your suggestions
> To: DIRECTOR KIET <director@kiet.edu>
>
> Dear Professor Garg
>
> My apologies for NOT responding early.
>
> I could go through 58 pages document on the process manual of NBA. It was my pleasure to have gone through the document
> It would like to thank you and your team who have done a great work. It is not an easy task by any standard to come out with a manual which takes care of Engineering, MBA, MCA and Pharmacy. Great emphasis is given on the COs attainment part which is important..
>
> I have very few observations/comments to make.
>
> 1. Page 20: It is NOT necessary to write one CO for each unit. It could be 5 COs and left to the course instructor to decide depending on the type of courses. For example a core design course an instructor may like higher Bloom levels and thereby could consider giving more than ONE COs in a given Unit.
>
> 2. Page 34 : Direct/Indirect assessment : I noticed that the attainment is high in indirect assessment. This is the reason why weightage for indirect assessment is kept 20 % and gave more weitghtage for direct assessment.(80%). You are thinking of 70 - 30 model, please reconsider.
>
> 3. Page 26 : PO 6 target is 1.8 : PO6 is Engineers and Society: I expect lots of Project work could be on this and target may go up. Also seminars could be on PO6. There may NOT be any **course** but curricular and co-curricular activities could be mapped.
>
> 3. Page 27 : In fact POs V/s PEOS and PEOs V/S Mission are NOT measurable being broad statements, anyway NBA wants it. In international accreditation it is normally NOT done
>
> 4. In students feedback I saw ONLY on curriculum but it is advised to take the feed back on teacher also. It is good to take 2 feedback one in thehalfway and one at the end.
>
> 5. The challenge for you is that you to have make every faculty to feel and understand OBE.

Once again it was a pleasure reading the manual and I congratulate you and your team for the great efforts.

With warm wishes
N C Shivaprakash

Dr N C Shivaprakash
Department of Instrumentation
Indian Institute of Science
Bangalore 560012

shivaprakashiisc@gmail.com
shiv@iisc.ac.in
080 22932242(O)
080 23601270(R)
0-9449086370/ 0-9945274628

On Mon, Apr 13, 2020 at 8:41 PM DIRECTOR KIET <director@kiet.edu> wrote:

Dr. N C Shivaprakash
Department of Instrumentation
Indian Institute of Science
Bangalore

Respected Sir,

Greetings from KIET Group of Institutions!!

At the outset, we trust that you and your family members are safe.

Outcome based education (OBE) - focuses on measuring student performance on the basis of program outcomes. That means focus will have to be on Understanding fundamentals very well, and learning new skills/competencies, that would enable individuals to cope up with the demands of the rapidly changing workplace.

As you may be aware, KIET is one of the top-rated institutions under AKTU. Started with 180 students, the Institute now has **5600+ students** which is a substantial growth in **22 years** and empowered with **300+** highly qualified full-time faculty to nurture our students. KIET offers **B.Tech Degree** courses in nine disciplines and in addition **M.Tech** in four disciplines, **MCA, MBA** & **Pharmacy (B.Pharm & M.Pharm) courses** to meet varied aspirations of the students. Our **annual Intake is 1765** including all our UG/PG programs. Our five **B.Tech** programmes **(CSE, IT, ECE, ME & EN)** and **MCA & Pharmacy** programmes are **NBA accredited** and Institute has **NAAC** accreditation status with **'A' Grade**.

KIET Group of Institutions has adopted all the processes of OBE & NBA (National Board of Accreditation). In reference with Self-Assessment Report* (June, 2015) and General Manual for Accreditation 2019 given by National Board of Accreditation (NBA) KIET has prepared a manual (NBA Manual - KIET Group of Institutions) for NBA Guidelines which explains the methods of calculation for Direct & Indirect attainment methods of Program Outcomes (POs), Program Education Objectives (PEOs), & Vision-Mission of the Institute.

This Manual is prepared so that all the departments of KIET will follow same methodology. With the help of this manual we have developed in-house software which gives all the calculations of NBA attainments (Direct & Indirect Methods).

Direct Attainment: All theory internal exams are based on OBE, each question paper is assigned with CO (Course Outcome) & Bloom's Level. In the ERP software we have created facility to upload marks CO (course Outcome) wise, which helps us to calculate different attainments & gaps by **Direct Methods.**

Indirect Attainment: We have created a facility to conduct different surveys (Curriculum feedback survey, Graduate Exit Survey, Alumni Feedback Survey, Industry Opinion Survey) through ERP software. These surveys will be used for calculations of Attainment by **Indirect Methods.**

We are putting this manual *(attached)* for taking your kind suggestions & approval of the methodology used for calculation of different attainments.

Please feel free to give your valuable suggestions.

Deep regards,

www.kiet.edu

KIET Group of Institutions

Delhi-NCR, Meerut Road (NH-58)
Ghaziabad - 201206

Dr. A Garg

Director

BE (DCE), M.Tech (IIT Delhi), Ph.D. (IIT Delhi)

PGDCST (ET&T)

Mob.: +91 8744097773

Shaping Young Minds with Skill Oriented & Value Based Education.

Please do not print this email unless it is absolutely necessary.

--

www.kiet.edu

Dr. (Col) A Garg

Director

BE (DCE), M.Tech (IIT Delhi), Ph.D. (IIT Delhi)

KIET Group of Institutions

Delhi-NCR, Meerut Road (NH-58)
Ghaziabad - 201206

PGDCST (ET&T)

Mob.: +91 8744097773

Shaping Young Minds with Skill Oriented & Value Based Education.

Please do not print this email unless it is absolutely necessary.

KIET GROUP OF INSTITUTIONS

YADUVIR SINGH <yaduvir.singh@kiet.edu>

Fwd: Humble Request - Draft NBA Manual_ KIET Group of Institutions:Seeking your suggestions

ANIL AHLAWAT <anil.ahlawat@kiet.edu> Mon, May 4, 2020 at 5:22 PM
To: YADUVIR SINGH <yaduvir.singh@kiet.edu>

Dear Sir

Very good suggestions and we have to correct / update our NBA manual.

Kindly see these suggestions and explore how this manual will be perfect in a positive way.

---------- Forwarded message ---------
From: **DIRECTOR KIET** <director@kiet.edu>
Date: Mon, May 4, 2020 at 3:44 PM
Subject: Fwd: Humble Request - Draft NBA Manual_ KIET Group of Institutions:Seeking your suggestions
To: <jointdirector@kiet.edu>, ANIL AHLAWAT <anil.ahlawat@kiet.edu>, DEAN AC <dean_ac@kiet.edu>, YADUVIR SINGH <yaduvir.singh@kiet.edu>

Dear All
Kindly see trailing mail
FYI Please

www.kiet.edu

KIET Group of Institutions

Delhi-NCR, Meerut Road (NH-58)
Ghaziabad - 201206

Dr. (Col) A Garg

Director

BE (DCE), M.Tech (IIT Delhi), Ph.D. (IIT Delhi)

PGDCST (ET&T)

Mob.: +91 8744097773

Shaping Young Minds with Skill Oriented & Value Based Education.

Please do not print this email unless it is absolutely necessary.

---------- Forwarded message ---------
From: **Prof. Onkar Singh** <onkpar@rediffmail.com>
Date: Mon, May 4, 2020 at 2:43 PM
Subject: Re: Humble Request - Draft NBA Manual_ KIET Group of Institutions:Seeking your suggestions
To: DIRECTOR KIET <director@kiet.edu>
Cc: OSINGH@hbtu.ac.in <OSINGH@hbtu.ac.in>

Dear Dr. A Garg
Please refer to your telephonic call with respect to the trailing mail.
I have gone through the document prepared by the Institution and appreciate this initiative.
As told earlier, I am sending some of my observations as under;

- Add details of PSO
- It will not be possible in all cases to have exclusive CO for each unit. So remove the restriction to have one CO from each unit. Better is to prescribe 5 COs without any qualifier.
- Approving authority for COs should be Department BOS and not any individual (HOD).
- Page - 25 - COs should have measurable words in their statements. Also, the statements should be realistic and attainable in the specific context of the course at the respective Institution.
- Page 26- In the mapping matrix, it will be better to give the mathematical relationship used to arrive at different estimates of target levels.
- Page 30 - The CO wise attainment level calculation is OK but the way of expressing it may be relooked. (Suggested: Obtained Y /Maximum Y)
    - Similarly, Overall % attainment level may also be expressed suitably.
    - The last column of the table be provided with a caption
- May think about evolving suitable mechanisms for maintaining the anonymity of student identity in capturing student feedback until one is a student of the institution.
- Online feedback collection should be brought into practice instead of a hard copy where the signature is required.
- The mechanism for handling the feedback needs to be spelled out for realizing the purpose of this exercise to improve.
- Careful reading will help in improving the text. At certain places, the corrections are required.
- The institution may think of a better name for this document dealing with outcome-based education, say for example ‘ OBE Manual’…….
- The web-based application developed by the Institution should be used for evaluating the attainments else faculty will be overburdened with the manual calculations.

Further, I wish to reiterate that after creating the framework for assessing the attainment levels and corrections thereto, the institution should lay more focus on enriching the quality of education.

Good Luck and Best Wishes.

Onkar

Dr. Onkar Singh,
Professor of Mechanical Engineering, School of Engineering, Harcourt Butler Technical University, Kanpur (U.P.) - 208002 INDIA
Founder Vice-Chancellor, Madan Mohan Malviya University of Technology, Gorakhpur - U.P. & Ex VC, UPTU Lucknow
Mob:0-9415114011 (Personal)
****

****

From: DIRECTOR KIET <director@kiet.edu>
Sent: Fri, 24 Apr 2020 17:49:24

To: onkpar@rediffmail.com, OSINGH@hbtu.ac.in
Subject: Humble Request - Draft NBA Manual_ KIET Group of Institutions:Seeking your suggestions

Respected Sir,

Greetings from KIET Group of Institutions!!

It is a pleasure to be in touch with you again. While we all are going through the unprecedented situation (COVID-19), I just wanted to make sure that all of you/ your family members are keeping good health & doing well.

Further, to my previous communication *(please refer trailing mail) w.r.t.* subject cited above, I want to humbly request you to please go through the attachment - *Draft -NBA Manual* submitted for your valuable inputs / suggestions & approval of methodology used for calculation of different attainment.

Your kind assistance would definitely help us in its effective implementation.

Looking forward to your kind response.

Deep regards,

Dr. A Garg

Director

---------- Forwarded message ---------

From: **DIRECTOR KIET** <director@kiet.edu>
Date: Mon, Apr 13, 2020 at 8:25 PM
Subject: Draft NBA Manual - KIET Group of Institutions: Seeking your suggestions
To: <onkpar@rediffmail.com>

Prof. Onkar Singh
Professor of Mechanical Engineering
School of Engineering, Harcourt Butler Technical University
Kanpur

Respected Sir,

Greetings from KIET Group of Institutions!!

At the outset, we trust that you and your family members are safe.

Outcome based education (OBE) - focuses on measuring student performance on the basis of program outcomes. That means focus will have to be on Understanding fundamentals very well, and learning new skills/competencies, that would enable individuals to cope up with the demands of the rapidly changing workplace.

As you may be aware, KIET is one of the top-rated institutions under AKTU. Started with 180 students, the Institute now has **5600+ students** which is a substantial growth in **22 years** and empowered with **300+** highly qualified full-time faculty to nurture our students. KIET offers **B.Tech Degree** courses in nine disciplines and in addition **M.Tech** in four disciplines, **MCA, MBA** & **Pharmacy (B.Pharm & M.Pharm) courses** to meet varied aspirations of the students. Our **annual Intake is 1765** including all our UG/PG programs. Our five **B.Tech** programmes **(CSE, IT, ECE, ME & EN)** and **MCA & Pharmacy** programmes are **NBA accredited** and Institute has **NAAC** accreditation status with **'A' Grade**.

KIET Group of Institutions has adopted all the processes of OBE & NBA (National Board of Accreditation). In reference with Self-Assessment Report* (June, 2015) and General Manual for Accreditation 2019 given by National Board of Accreditation (NBA) KIET has prepared a manual (NBA Manual - KIET Group of Institutions) for NBA Guidelines which explains the methods of calculation for Direct & Indirect attainment methods of Program Outcomes (POs), Program Education Objectives (PEOs), & Vision-Mission of the Institute.

This Manual is prepared so that all the departments of KIET will follow same methodology. With the help of this manual we have developed in-house software which gives all the calculations of NBA attainments (Direct & Indirect Methods).

Direct Attainment: All theory internal exams are based on OBE, each question paper is assigned with CO (Course Outcome) & Bloom's Level. In the ERP software we have created facility to upload marks CO (course Outcome) wise, which helps us to calculate different attainments & gaps by **Direct Methods.**

Indirect Attainment: We have created a facility to conduct different surveys (Curriculum feedback survey, Graduate Exit Survey, Alumni Feedback Survey, Industry Opinion Survey) through ERP software. These surveys will be used for calculations of Attainment by **Indirect Methods.**

We are putting this manual *(attached)* for taking your kind suggestions & approval of the methodology used for calculation of different attainments.

Please feel free to give your valuable suggestions.

Deep regards,

www.kiet.edu

KIET Group of Institutions

Delhi-NCR, Meerut Road (NH-58)
Ghaziabad - 201206

Dr. A Garg

Director

BE (DCE), M.Tech (IIT Delhi), Ph.D. (IIT Delhi)

PGDCST (ET&T)

Mob.: +91 8744097773

Shaping Young Minds with Skill Oriented & Value Based Education.

Please do not print this email unless it is absolutely necessary.

--
Thanks & Regards

Dr. Anil K Ahlawat
M.Tech (CSE), Ph.D (GGSIPU)
Professor (CSE) & Dean (Academics)
KIET Group of Institutions
Ghaziabad - Meerut Highway (NH 58)
Ghaziabad - 201 206, U.P., India
Mobile: +91 9891616861
alternate mail: dranilahlawat@gmail.com

Google Scholar | ORCID | Scopus | Web of Science