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INSTITUTE OF ENGINEERING & TECHNOLOGY

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Teaching Learning Process

Poornima Institute of Engineering & Technology

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Teaching Learning Process in PIET

As per the vision of the Institute and as per the guidelines of the governing body and Governing Council, PIET shall have a stringent teaching-learning process. In order to deliver quality education to the students and to deliver quality technocrats to the society in line with its Vision statement the Teaching learning process of PIET, has been defined as a systematic, sequential, planned course of action on the part of both the teacher and learner to achieve the outcomes of teaching and learning.

Poornima Institute of Engineering and Technology (PIET) is affiliated to Rajasthan Technical University (RTU). The whole system of teaching and learning process can be well understood by the following given summary of the process:

- PIET adheres to the teaching learning process for the faculty members and students as per the determined syllabus (revised time and again by the BOS of the Rajasthan Technical University) after the required contemplation in BOS & Faculty meetings.
- In accordance with RTU's syllabus for the respective academic session, a comprehensive review of the syllabus for all theory and practical subjects is conducted in the campus as well duly appended by various beyond classroom learning practices like Value Added Courses, Industrial Visits, Industry interaction sessions and many more.
- As per the notified RTU Calendar, the entire academic session of the Institute is planned, encompassing the scheduling of classes, continuous assessments and other academic & non academic activities. The same comes in shape as a document namely PIET Academic Calendar and is shared amongst all stakeholders. This strategic approach ensures a well-organized and structured academic environment in PIET by facilitating effective teaching, learning, and assessment throughout the session.
- The Internal Quality Assurance System (IQAC) plays a pivotal role in the initial planning phase of the academic session in a college by ensuring the alignment of the curriculum with institutional goals and accreditation standards.
- IQAC conducts a thorough review of the syllabus, assesses faculty development needs, and evaluates resource adequacy. IQAC establishes quality benchmarks, implements feedback mechanisms, and collaborates with faculty to devise effective assessment strategies.
- Faculty requirement analysis is a key part of academic planning guided by the Internal Quality Assurance Cell (IQAC). It involves checking if faculty members have the right expertise for the planned courses and identifying any training needs.
- The Head of Department distributes teaching responsibilities and other tasks among faculty members to achieve a fair and balanced distribution of work, leveraging the strengths of each faculty member. A productive and supportive teaching environment is ensured.
- The creation & distribution of class and faculty timetables are efficiently managed by the Head of Department. This streamlined approach ensures a well-organized timetable that facilitates effective teaching & learning.



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- The Teaching- learning process takes place through Zero Lecture, Deployment, Blown-up and by preparing course files by all the faculty members.
- The continuous assessment (Direct and Indirect) involves regular classroom tests, midterm exams, assignments duly supported by remedial classes for weaker students and special classes for advanced learners.
- Feedback of all the stakeholders is an important initiative by IQAC of the institution that includes feedback on Curriculum, teaching learning process, academic and non academic facilities, placement oriented activities and administrative process. Students, parents, alumni, teachers and employers provide feedback on fixed frequencies, some of them are taken twice in a semester, while some are done bi-annually and some are done on an annual basis.
- Outcome-Based Education (OBE) assessment process involves direct, indirect assessment methods and feedback, measuring students' performance through exams and practical evaluations, and incorporating assignments and feedback.
- The Internal Quality Assurance Cell (IQAC) reviews academic activities at the end of academic session to identify improvement areas and formulate strategies for continuous enhancements in education quality and institutional effectiveness.
- The IQAC obtains the appropriate feedbacks by following the proper system with institutional and departmental leaderships and submits its suggestions to Rajasthan Technical University (RTU) for revision in curriculum (as an when applicable)

This whole teaching and learning process can be well comprehended with the following drawn flowchart:

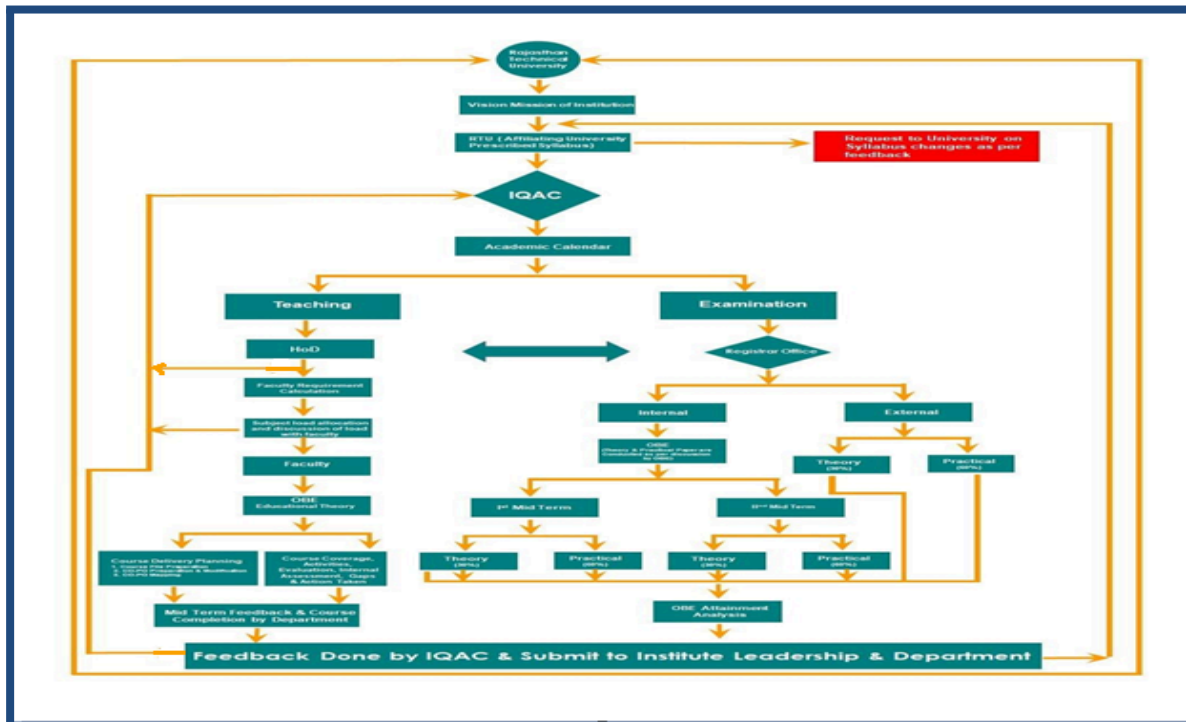


Fig. - 1 Teaching- Learning Process in PIET



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Detailed illustration of Teaching learning process at PIET

At Poornima Institute of Engineering and Technology (PIET), the teaching-learning process adopts different methods such as experiential learning, participative learning and problem solving methodologies utilizing ICT facilities and e-resources. All the academic activities are carried out strictly following the academic and activity calendar prepared as per the prescribed scheme and syllabus by RTU. The necessary efforts are being made in identifying the learning levels (slow and fast) of the students through various assessments and additional training is imparted to slow learners. The institution efficiently works through the Department Advisory Board (DAB) and Program Assessment Committee (PAC) for the attainment of COs, POs and PSOs of all subjects. The Department Advisory Board (DAB) and Program Assessment Committee (PAC) system is diligently working in PIET for the counseling and to monitor academic and personal issues of students.

For the effective curriculum development and implemented process, PIET has established a strong system of Department Advisory Board (DAB) and Program Assessment Committee (PAC) in the following ways:

Department Advisory Board (DAB):

The Departmental Advisory Board (DAB) has been framed with the objective of remaining up to date with the latest requirements of the industry and incorporating necessary components in the curriculum as much as possible by incorporating the scheme and syllabus given by RTU. The DAB is composed of members from eminent institutions as well as members from industry, alumni and members of faculty of the department. The purpose of the Department Advisory Board (DAB) is to help the institution in gaining new insights and advice to solve problems related to curriculum development and implementation or exploring new opportunities by stimulating robust, high-quality conversations.

Department Advisory Board (DAB)- Role and Responsibilities:

- DAB consists of the head of the department, program coordinators, and the representatives of key stakeholders.
- DAB is chaired by the Head of the department, receives the report of the Program Assessment Committee and monitors the progress of the program, on current and future issues related to programs.
- Reviews, assesses, and monitors the attainment of the departmental PSOs.
- Develops and recommends new or revised program goals and objectives. DAB meets at least once in a year to review the programs.
- The Board interacts and maintains liaison with key stakeholders.
- Monitors the reports of the DAB and progress of the program.
- Develops and recommends new or revised goals and objectives of the program.
- Reviews and analyses on the gap between curriculum and Industry requirement and gives necessary feedback or advice actions.
- Monitoring of Course plan and delivery of the lecture plans.
- Verification of Faculty course files including Attendance Entry on TCSion, Internal and External



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Marks and syllabus coverage of all subjects.

- Identification of slow learners and above average performers and implementation of necessary actions required for them.
- Submission of report to the IQAC of the institution in the prescribed format

Program Assessment Committee (PAC):

The Internal Quality Assurance Cell (IQAC) of PIET has established the Program Assessment Committee (PAC), whose members are committed to strategic planning and efficient oversight of the Institute's operations in order to guarantee curriculum transfer and methodical evaluation. PAC is formed with the intention to improve quality of curricular and co-curricular activities in teaching learning process. The PAC consists of faculty members and student representatives in the department.

The coordination and management of all academic activities falls within the purview of the Program Assessment Committee. PAC is responsible for organizing, carrying out, and supervising academic activities during the semester. The other objectives of this committee include organizing extracurricular, co-curricular, and academic activities for the upcoming semester and academic year. This committee also evaluates the previous years and semester's activities and recommends ways to enhance results to the director and administration of the institution.

Objectives of PAC:

The goals of Program Assessment Committee (PAC) are as following:

- To ensure that instruction and learning are conducted effectively throughout the semester.
- To create an academic monitoring system to guarantee that the academic calendar is implemented successfully.
- To make sure that all the departments have completed the necessary preparations for conducting lectures and practicals prior to the commencement of the semester.
- To guarantee that teaching and learning are supported by efficient ongoing assessment and evaluation.
- To guarantee that students receive mentorship for both personality and intellectual development.
- To ensure that course outcomes are met, which leads to program outcomes.
- To conduct routine internal audits of files and records.
- To determine that the needs of both advanced and slow learners are met.

Program Assessment Committee (PAC)- Roles and Responsibilities:

- The Program Assessment Committee consists of Program Coordinator, Module Coordinator and faculty representatives.
- It is chaired by the Program Coordinator. The committee also strictly monitors the attainment of POs and PSOs.
- Evaluates program effectiveness and proposes necessary changes to be done in any unit of the syllabus.
- Prepares periodic reports on program activities, progress, status or other special reports for management and key stakeholders.



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- Motivates the faculty and students towards attending workshops, developing projects, working models, paper publications and research, assessing course content / delivery.
- Interacts with students, faculty, Program Coordinators, Module Coordinator and outside/community agencies (through their representation) in facilitating PSOs. PAC meets at least once in 6 months to review the program and submits reports to the Department Advisory Board.
- Providing approval to the department's and institutions academic schedule and providing the necessary funding for its execution.
- Executing extracurricular, co-curricular and academic events for the upcoming semester as per the schedule in the academic calendar.
- Periodically monitoring and assessing the institution's numerous processes in order to pursue continual improvement
- Regularly go over the minutes from all of the committee meetings as well as the HoDs meeting.
- Examine and suggest changes to the various departments' budgets, and keep track of last year's budget usage.
- Discuss about the stakeholders' feedback analysis report and make required corrections as per the suggestions to improve the institution.

Actions taken by PAC (Program Assessment Committee):-

Preparation and Finalizing of the Academic Calendar:

As per the RTU Calendar, an academic calendar is created prior to the start of the semester based on the academic schedule that is released by the PIET. Every semester, the PAC finalizes the Academic Calendar and guidelines, which includes information about holidays, the tentative schedule of university practical and theory exams, the date of syllabus completion, curriculum delivery, internal assessment schedule, enrichment programs, guest lectures, workshops, seminars, symposiums, value-added courses, etc. The Academic Calendar is provided to the various departments of PIET at least one month in advance before the commencement of the new semester.

Process involved in formulating the Academic Calendar:

The institutional academic calendar contains plans for academic and assessment schedules with curricular and co-curricular activities based on the available working days as per norms framed by the Rajasthan Technical University. The academic calendar provides information about the date of commencement of the semester, internal assessment Test schedule, audit schedules, academic related activities like Project review schedule, club related activities, events pertaining to professional bodies (guest lectures, seminars, workshops & conferences), conduction of Lab internals and information with respect to State government and local holidays.



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Preparation of Departmental Academic Schedule:-

Following the creation of the institutional academic calendar, each department head consults with the department's faculty. Departments must list on the preliminary dates for extracurricular and co-curricular student activities, mock practical's, due dates for assignments and projects, workshops, seminars, guest lectures, and other events.

Timetable Construction:

The creation and distribution of class and faculty timetables are efficiently managed by the department's timetable coordinator, working under the guidance of the Head of the Department. This coordinator is responsible for scheduling classes, assigning appropriate time slots for each subject, and developing individual faculty timetables. This streamlined approach ensures a well-organized timetable that facilitates effective teaching and learning. Once finalized, the timetables, overseen by the coordinator, are distributed to students and faculty, providing clear guidance for class schedules and aiding in systematic planning for all involved in the academic process.

Load Allocation by Head of the Department:

The Head of departments distributes teaching responsibilities and other tasks among faculty members based on their expertise and capacity. The objective is to achieve a fair and balanced distribution of work, leveraging the strengths of each faculty member. A productive and supportive teaching environment is ensured. The Heads of departments assign the courses at the end of the preceding semester so that faculty members have time to begin preparing for the courses they have been assigned.

Preparation of Teaching Plan and Lab Plan:

The personnel in charge of the related subjects prepare the lesson plans, study guides, and lab manuals. Each faculty member will create a lesson plan, a lab schedule for the full semester that follows the syllabus, and a schedule for classes. A thorough theoretical and lab schedule organized by date and unit will be created in accordance with the format. The department head and the director must approve the lesson plan. Uniformity in content coverage and assessment is ensured. For reference, lecture notes, question banks, and model question papers can be found on the ERP.

Preparation of Course Files:

The Course File is a structured compilation of academic documents, including syllabi, lecture plans, assessments, lecture notes and other relevant materials, organized and maintained for each course by faculty members; this file ensures transparency and adherence to RTU standards. In PIET, before the commencement of new semester, each faculty member prepares the course file of their respective subjects which includes the following documents after getting approval by the HOD and the Director:

- **Scheme – RTU:** This includes the overall scheme of the program approved by the affiliated Rajasthan Technical University (RTU).



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- **Syllabus:** The RTU approved syllabus of the taught subject is also attached in the course file.
- **ABC Analysis of Students:** This document highlights the students' achievements according to their IQ (Intelligence Quotient) level i.e. high, medium and low.
- **ABC Analysis of Subject:** All the subjects include different types of topics and this document states the easy, moderate and hard level of topics in terms of comprehension by the students. This analysis is done on the basis of each unit of the subject.
- **Subject Approach Paper:** The overall planning, determining the Bloom's Taxonomy based objectives for the expected behavioral changes by the students, use of appropriate teaching methods and teaching aids is included in this document.
- **RTU Question Papers:** The previous year RTU question papers are also attached in the course file for guiding the students from examinations' point of view.
- **RTU Question Paper Analysis:** This document is related to the marks distribution of particular units of the subject in already assessed RTU question papers. This helps the faculty members and students to prepare themselves for the assessment in a focused manner.
- **Important Question Bank:** The important questions from each unit are prepared in this document for the effective preparation of the assessment process.
- **Blown Up:** This document outlines the detailed breakdown of lecture content, enabling instructors to navigate through the syllabus systematically and guarantee comprehensive understanding of all subjects during the academic session.
- **Deployment:** The Deployment documentation is a comprehensive record of faculty members that includes essential details such as lecture number, unit information, points to cover, proposed and actual dates, study material references, and unit names.
- **Zero Lecture:** The Zero lecture serves as a preparatory session before regular classes commence, allowing the students to review essential prerequisites and revisit relevant topics for upcoming subjects.
- **Home Assignments (Regular, Google Classroom, Quiz, Class test or any other):** This document is also attached in the course file mentioning the home assignments of all the units of subject. This also includes the details of quiz and classroom tests that are planned to be taken through online or offline mode.
- **Detailed lecture notes with front pages:** The faculty members prepare the detailed hand written notes of their subject with front pages which includes the course objectives (CO) and course outcomes.

Orientation for First Year: RTU proposed a 2-week long induction program for the students entering the engineering institutions under RTU, right at the start. Its purpose is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature. The time during the Induction Program is also used to rectify some critical lacunas, for example, English background, for those students who have deficiency in it.

Continuous Assessment: The continuous assessment involves the regular conduct of classroom tests, internal exams for theory and practical subjects. The faculty members diligently check assignments and tests, providing timely feedback. Additionally, particular schedules are also prepared



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Defining CO-PO-PSO according to Bloom's Taxonomy: In PIET, the course objectives are determined as per the Bloom's Taxonomy is a classification of the different outcomes and skills that educators set for their students (learning outcomes). The taxonomy was proposed in 1956 by Benjamin Bloom, an educational psychologist at the University of Chicago. The terminology has been recently updated to include the following six levels of learning. These 6 levels are used to structure the learning outcomes, lessons, and assessments of the course.

- **Remembering:** Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
- **Understanding:** Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
- **Applying:** Carrying out or using a procedure for executing, or implementing.
- **Analyzing:** Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
- **Evaluating:** Making judgments based on criteria and standards through checking and critiquing.
- **Creating:** Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

Course outcomes (COs): Course outcomes (COs) are direct statements that describe the essential and enduring disciplinary knowledge, abilities that students should possess and the depth of learning that is expected upon completion of a course. They are clearly specified and communicated. The Course Outcomes are prepared by the course coordinator in consultation with concerned faculty members teaching the same course.

Program Outcomes (POs): Program outcomes describe what students are expected to know and would be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program.

Program Specific Outcomes (PSOs): Program Specific Outcomes are statements that describe what the graduates of a specific engineering program should be able to do.

Dissemination of Vision, Mission, Quality policy, COs, POs, PSOs : The institute establishes the Vision, Mission, Quality policy, COs, POs, PSOs & through a consultation process involving the stakeholders of the department and considering the societal requirements. The department's Vision and Mission are framed within the departments that are derived from the Institutional Vision and Mission



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Affiliated to RTU, Kota • Approved by AICTE & UGC under 2(f) • Accredited by NAAC and NBA statements. The Program Assessment Committee (PAC) circulates these statements among the stakeholders of the program such as Industry, Faculty, Alumni, Parents & students.

Employer and collects the views to refine the draft Vision and Mission statements. These draft statements are forwarded to the Internal Quality Assessment Cell (IQAC) to look into the relevance and consistency with the Vision and Mission of the institute. The following table shows the whole process of dissemination of Vision, Mission, Quality policy, COs, POs, PSOs:



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S. No	Stakeholders	Activities/Meetings	Mode of communication	Period of Interaction
1.	Students	Semester Reopening Day	College website, Notice boards, Department Notice boards, Library, Department Magazines, Student induction program, Student awareness workshops, Question Papers, Student profile & Progress Report	Semester wise
		Department Events		Periodically
		Students Counseling Meeting		Quarterly
2.	Students	Induction Day Fresher's Day	College website, Weekly schedules, Meeting Hall, Notice boards, Student induction program	Yearly once
3.	Parents	Induction day	Tutors and HOD	Yearly Once
4.	Industry Experts	R&D Meeting	College website, Presentation by Institute Head	As Required
		MoU Meeting		As Required
5.	Academic Experts	Seminar	College website, feedback forms, Conference coordinators, Department event Organizers	Frequently
		Workshop		Semester wise
		Conference		Yearly once
		Guest Lectures		Periodically
6.	Faculty Members	Management meeting With Experts	College website, Notice boards, Faculty meetings	Semester wise
		Department meetings	Notice boards, Official Email ID	Semester wise



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Table-1: Dissemination of Vision, Mission, Quality policy, COs, POs, PSOs

PROGRAM SPECIFIC OUTCOMES (Process for Defining PSOs): The Program Assessment Committee along with the stakeholders defines the program specific outcomes after having a brainstorming session with the stakeholders:

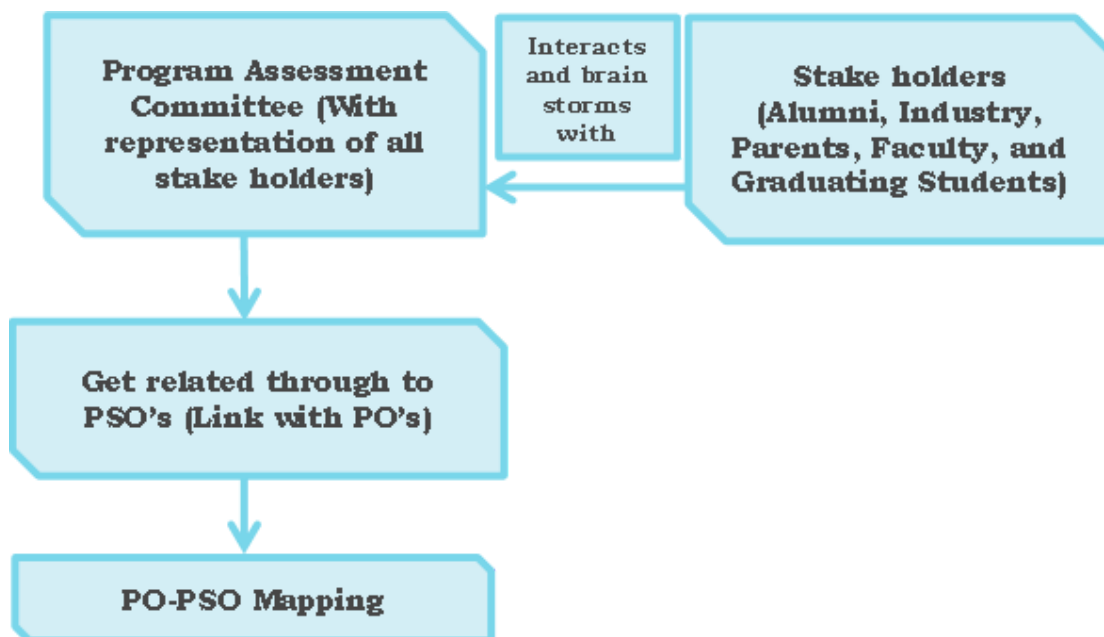


Fig.-2 Process for defining PSOs

Determining the Program Outcomes (Graduate Attributes):

The PAC ensures that in all subjects engineering graduates of PIET must be able for:

- **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **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.
- **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.
- **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.
- **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and



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modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

- **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.
- **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.
- **ETHICS:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **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.
- **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.
- **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.

Curriculum Enrichment: Expert lectures, presentations/seminars, mini projects, internal and industry-supported projects, tutorials, group assignments, case studies, industrial visits, industrial training, internships, hands-on sessions, e-learning, NPTEL lectures, MOOCs, assignments, internal tests, and any other domain-specific activities, etc., should be added to classroom instruction to ensure the effective implementation of the curriculum. To expose students to current industry trends, content beyond the curriculum is selected and taught in both the classrooms and the laboratory. Their bachelor's experience is further enhanced by the curriculum enrichment options, which offer even more depth, breadth, personal development, community or societal engagement, and international character.

Academic Monitoring: The HoD, Director and IQAC monitor on how the curriculum is being covered. The number of courses scheduled vs the number of lectures actually given are tracked, and where necessary, remedial actions are also taken to close the difference. The effective monitoring of the teaching and learning process is surely made effectively possible by a variety of pre-formatted report forms. Activities include tracking attendance, syllabus coverage, slow and advanced learner activities, internal assessments, daily lab and class sessions, result analysis, and communication with parents.

Academic Audit and Review of outcomes: The purpose of the Academic audits is to make sure the academic system runs smoothly. The activities related to creating learning outcomes, designing and developing curricula, the teaching-learning process, the student learning evaluation process, and



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Expected Outcomes of Program Advisory Committee (PAC):

The following outcomes are expected from the Program Advisory Committee (PAC) of the institution:

- Faculty dedication
- Timely administration of academic activities
- Timely record-keeping
- Improved university results
- Improved graduate student quality
- Improved postgraduate student research activity
- Effective knowledge transfer to students, instilling a disciplined culture through attendance monitoring and necessary mentoring
- Establishment of standard formats for records to be kept for audits
- Review and audit to gauge the institute's academic performance.

The Assessment Process Outlined with Outcome Based Education (OBE):

The assessment of programs at the department level is broadly done outlined with outcome based education (OBE) under two criteria:

Direct Assessment (DA): Using Program Outcomes prescribed by NAAC, the faculty member evaluates the Program Outcomes and Program Specific Outcomes through Internal Assessment Tests, Assignments / Tutorial and Group Discussion. PO will be evaluated by the CO-PO Mapping with the attainment value for each course. For each course, every faculty member decides the competency level and attainment level.

Indirect Assessment (IA): Indirect assessment methods require that faculty infer actual student abilities, knowledge, and values rather than observe direct evidence. Among indirect methods are surveys, exit interviews, focus groups, and the use of external reviewers. The following tools are used to assess the indirect assessment of attainment of COs, POs and PSOs. The assessment tools listed are used for both CO, PO – PSO attainment calculation.

The tools used for Indirect Assessment are as follows:

- Alumni: Survey Questionnaire
- Course Exit Survey
- Exit Feedback: Survey Questionnaire
- Parent: Survey Questionnaire
- Employer's Feedback Form
- Feedback Form on Facilities
- Analysis Of Students Feedback

Tools used for Direct Assessment: In Direct Assessment (DA), the Internal Assessment of the



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- Student performance in Mid-semester and End-semester Examinations.
- Student performance in Tutorials / Assignments.
- Student performance in Project Work, Viva-voce, Internship and Seminars.

Steps involved in Direct Assessment process:

- The marks obtained by the students in a class are entered in an MS Excel file. Every question is mapped to a CO which in turn is contributed to one or more POs.
- Upon entry of the marks data, the formulas embedded in the Excel file estimate the corresponding CO(s) attainment percentage based on the percentage of the students who cross a 50% threshold level. Based on the question pattern, it is possible that one or more COs are impacted.
- In the case of Internal Examinations, the first Internal determines the attainment of the first two CO while the second internal exam determines the attainment of the third and fourth.
- The final CO – PO attainment table is populated manually by the faculty taking the respective course, based on the four/five CO attainments obtained at the end of above step i.e., after the two Internal Assessments.
- This process is followed for all courses in any given semester.
- At the end of the four-year program / eight semesters, the subject- wise PO attainments are collated so as to arrive at the average attainment for each PO.
- The students have an opportunity to assess, express and communicate the impact of different course delivery formats / mechanisms used by the faculty during the semester, through the Course-end Survey. These are manually assessed by the respective faculty member, the Module Lead / Coordinator and the Academic Coordinator / Program Assessment Committee as might be necessary.

Theory courses: The faculty members calculate the course outcome attainment using University Examination and Internal Assessment Tests for each theory course. The attainment level is calculated based on the average performance levels of both University Examination and Internal Assessment Test. The evaluation process of Internal Assessment Tests/Assignments/Tutorials/Group Discussion is counted for 30 marks and the remaining 70 marks will be given for university examination. Based on the level of CO attainment, the faculty member decides whether to increase the competency level or change the content delivery method, assessment methods to improve attainment level for the course. The following table shows the details of CO attainment through Internal Assessment tools and University Examination:



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Assessment Tool		Marks	Frequency
CO	Internal Assessment Tests	30	Twice in a Semester
Attainment	University Examination	70	Once in a Semester

Table-3: Details of CO Attainment

Laboratory Courses: For laboratory courses, the course outcome will be calculated based on performance, viva-voce, record work and model practical examination with the weightage of 60% for Continuous Internal Assessment and 40 % weightage for University Practical Examination. Based on the CO attainment level, the faculty member will decide whether to increase the competency level or enhance the practical knowledge of the students in order to improve attainment level for the laboratory course.

The evaluation method and the process involved in the direct assessment is shown in the following table:

Evaluation Methods	Process
Internal Assessment Tests	Two Internal Assessment Tests are conducted per semester to evaluate the attainment of course outcomes. Each question is mapped with COs and Blooms level.
Assignments & Tutorials	The tutorials and assignments are given to the students based on the subject nature. For four credit papers tutorials are mandatory. Tutorial and Assignment sheets are prepared by the faculty member with COs and levels.
Continuous Assessment & Model Exam(Laboratory Course)	The evaluation criteria for each experiment are based on performance, viva-voce and record mark. The attainment of COs is calculated through continuous assessment and model practical performance.
Project Reviews	Three reviews are conducted periodically to monitor and evaluate the progress of the project using project rubrics. Viva-Voce is conducted at the end of the semester as per University norms.
University Examination	At the end of each semester, final examination is conducted for Theory and Laboratory courses by University, in which question paper covers the entire syllabus and all the Cos are covered in the question papers.

Table-4: Direct Assessment for CO-PO



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Assessment Tool		Weightage	Frequency
CO Attainment	Continuous Internal Assessment	60%	Every Week
	University Practical Examination	40%	Once in a Semester

Project Work Assessment: For project work, Continuous Internal Assessment is based on the performance in the three reviews. The Course Attainment is calculated based on the three reviews and project Viva voce.

- Project review is conducted every month to review the progress of the project and the second review will be conducted in the presence of an industry expert.
- Suggestions are given to the students for their continuous update and improvement. Evaluation of each review is based on the parameters discussed in the teaching learning process.
- The faculty member decides the competency level and attainment level for project work considering the average performance level of the students.

Achievement of Attainment Level: The educational attainment refers to the highest level of education that a person has successfully completed. The successful completion of a level of education refers to the achievement of the learning objectives of that level, typically validated through the assessment of acquired knowledge, skills and competencies.

Category-A	Level 3	Level 2	Level 1
Internal (MID I & MID II)/Survey	60 % of students getting > 60% marks	50-60 % of students getting > 60% marks	40-50 % of students getting > 60% marks
Lab/Seminar/Project-Internal	>80%	50-80%	<50%
Lab/Seminar/Project-External	>70%	50-70-%	<50%
RTU	50%-100% Marks	50%-30% Marks	0%-30%
Overall	55-100%	55-40%	<40%

Attainment level



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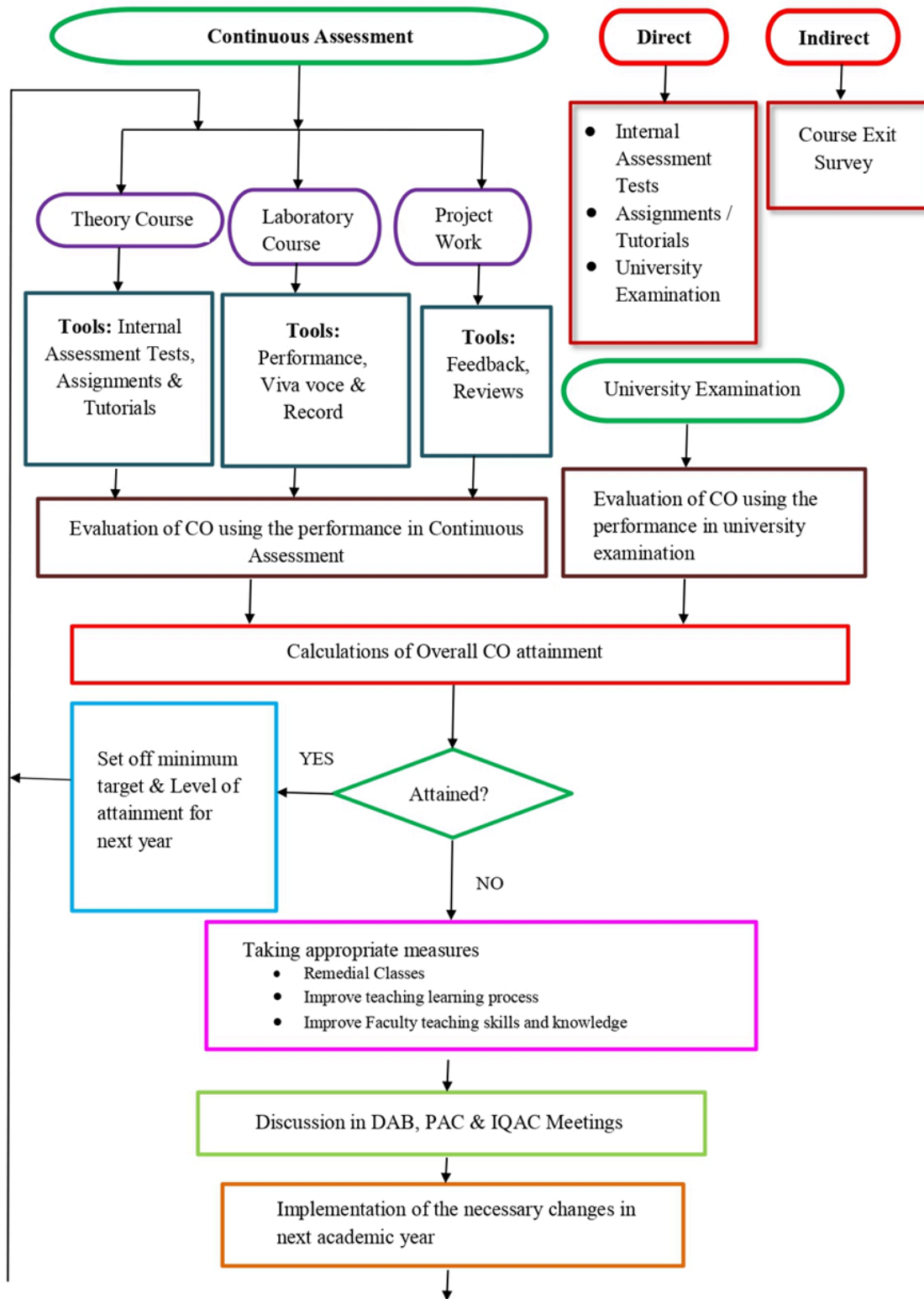


Figure 1 Process for CO Attainment



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Tools used for Indirect Assessment: Evaluation of attainment of POs and PSOs is based on direct and indirect assessment tools. Direct assessment of POs and PSOs is based on students' performance in Continuous Assessments and University Examination. Indirect assessment is based on Program Exit Survey, Alumni Survey and Course Exit Survey (Theory and Practical).

S. No.	Tools used for Indirect Assessment
POs , PSOs Indirect Assessment Tools	
1	Program Exit Survey
2	Alumni Survey
CO Attainment Indirect Assessment Tool	
3	Course Exit Survey

Table-5: Indirect Assessment Tools

Program Exit Survey: It is a process of collecting satisfaction survey on the quality of education from the perspective of graduating students upon the completion of their program. Program Exit Survey is structured with 5 liker scale questions. The survey helps in identifying the following:

- Perception on the overall quality of teaching, learning and mentoring.
- Opinion about the support provided by the programme in projects, modern tools and software's.
- Support provided for extra-curricular and co-curricular activities.
- Exposure to the competitive exams and personality development programs.
- Insight on imparting skills like entrepreneurship and societal responsibility through NSS, NGO and Club's Improvement on facilities.

Alumni Survey: The alumni survey is conducted through the survey questionnaires after graduation towards the achievement of POs and PSOs. The survey form is structured with six sections which includes the following parameters:

- Personal information.
- Employment/higher studies/entrepreneurship- details.
- Technical, professional, communication and general skills at present towards RIT contribution.
- Experience at RIT in projects, extra-curricular, co-curricular activities, personality development, sports and NSS facilities.
- Suggestions for further improvement.
- Suggestions for bridging curriculum gap and other valuable inputs.

Course Exit Survey (Theory & Practical): The course exit survey is process of collecting reviews on each course from the students at the end of each semester. It helps to improve the overall aspect of the course in future semesters. The survey covers the overall view about teaching and learning of the



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- Course Content- Quality of the content provided, incorporation of Outcome Based Education
- Course Delivery- Experience about the teaching methodologies, ICT tools, NPTEL resource utilization
- Course Assessment- Methodology of evaluation, feedbacks on assignments and tutorials
- General suggestions for improvement

Mapping of assessment tools to POs/PSOs with frequency of Assessment: In each course, the level of attainment of each CO is compared with the predefined targets. With the help of CO against PO/PSO mapping, the PO/PSO attainment is calculated by the Program Coordinator.

The various assessment tools are used to evaluate the COs and the frequency with which the assessment processes are carried out are listed below in the given table:

Mode of Assessment	Assessment Tool	Description	Evaluation of course outcomes	Related PO/PSO	Frequency of Assessment
Direct	Theory internal examinations /Assignments	Two written examinations are conducted and its average marks are considered	The questions in the internal examinations and assignment sheets are mapped against COS of respective course.	PO1 to PO12	Continuous
Direct	Day to day evaluation in Laboratory	The day-to-day evaluation is considered	The final attainment for each CO is calculated by taking average of the % attainment from day-to-day evaluation and internal lab examination	PO1 to PO12	Continuous
Direct	Internal Practical Examination	Internal examination is conducted		PO1 to PO12	Two per semester
Direct	End Semester Examination	End Examination is conducted	The questions in the end examinations are mapped against COS of respective course. The questions for end examinations are framed in such a way to cover all course outcomes	PO1 to PO12	One per semester
Direct	Summer Internship	To test students' concepts in independent analysis.	Two internal project reviews are conducted and average of these two review assessments are considered	PO1 to PO12	Summer Internship



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Direct	Project	To test students' concepts in design creative thinking and independent analysis three project reviews are conducted	Continuous assessment is carried by the project review committee first review emphasizes on literature survey and problem identification, second review on design methodology and the third review on the validation of the model and documentation. The external examiner assessment is considered as another assessment tool for project work and final CO attainment calculated.	PO1 to PO12	Major Project-VIII semester
Direct	Technical Seminar	To Test the students in knowledge in Recent Technical advancements and their Presentation Skills	At end of semester a student has to Present the seminar and submit the report	PO1 to PO12	VIII Semester
Indirect	Alumni survey	This survey gives the opinion of the student on the attainment of course outcomes	At the end of the program alumni survey is collected from alumni and considered for the PO attainment under indirect assessment.	PO1 to PO12	At the end of the program
Indirect	Graduate exit survey	This survey gives the opinion of the graduate on the attainment of course outcomes	At the end of the program exit survey is collected from alumni and considered for the PO attainment under indirect assessment.	PO1 to PO12	At the end of the program



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Direct	Project I & Project II	To test students concepts in design creative thinking and independent analysis three project reviews are conducted	Continuous assessment is carried by the project review committee first review emphasizes on literature survey and problem identification, second review on design methodology and the third review on the validation of the model and documentation. The external examiner assessment is considered as another assessment tool for project work. Final CO attainment calculated from final CO attainment is calculated from	PO1 to PO12	Minor project-VII semester & Major Project-VIII semester
Direct	Technical Seminar	To Test the students in knowledge in Recent Technical advancements and their Presentation Skills	At end of semester a student has to Present the seminar and submit the report	PO1 to PO12	VIII Semester
Indirect	Alumni survey	This survey gives the opinion of the student on the attainment of course outcomes	At the end of the programme alumni survey is collected from alumni and considered for the PO attainment under indirect assessment.	PO1 to PO12	At the end of the program
Indirect	Graduate exit survey	This survey gives the opinion of the graduate on the attainment of course outcomes	At the end of the programme exit survey is collected from alumni and considered for the PO attainment under indirect assessment.	PO1 to PO12	At the end of the program

Table-6: Tools and process for Direct & Indirect PO attainment



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Feedback and Corrective Measures: Poornima Institute of Engineering and Technology firmly believes in imparting quality education to all the students by continuously innovating on the programs to be offered and the teaching learning techniques to be employed to meet the diverse student community. Teaching learning process is continuously reviewed by the IQAC; the Head's of the department and the teacher mentors. The structured feedback is taken from the students and all other stakeholders. The feedback received is analyzed and appropriate action is taken to meet the standards. The student-parent-teachers meetings are conducted and the suggestions relating to the teaching learning process are considered for further improvement. The stakeholders are regularly consulted regarding the following parameters:

- Curriculum delivery
- Enrichment activities
- University question papers
- Invited speeches, seminars, workshops, and conferences
- VAC course offerings, etc

Requesting Rajasthan Technical University (RTU) for syllabus changes as per Feedback:

Analysis of the feedback is done and corrective actions are taken for effective outcomes. The IQAC involves in teaching learning process right from the starting of the academic year to the semester end. IQAC conducts the internal evaluation of all departments whether curricular, co-curricular and extracurricular activities are conducted as per the planned calendar or not. If any changes are required in the syllabus of a particular subject as per the received feedback then IQAC requests the affiliating Rajasthan Technical University (RTU) for essential changes through BOS meetings.

Conclusion: So, it can be stated that at the conclusion of the academic session, the Internal Quality Assurance Cell (IQAC) conducts a comprehensive review of all academic activities, including curriculum implementation, faculty performance, and assessment processes for conducting the smooth and effective teaching- learning process. This diligent review serves as the basis for identifying areas of improvement and success. Subsequently, the IQAC formulates strategies by incorporating all the norms of affiliating Rajasthan Technical University (RTU) for further actions and planning, ensuring ongoing enhancements in the quality of education and overall institutional effectiveness.