

Yashoda Shikshan Prasark Mandal

Yashoda Technical Campus, Satara

An Autonomous Institute



Quality Assurance and Continuous
Improvement Processes



Preamble

The **Quality Assurance and Continuous Improvement Processes** provide a systematic framework for maintaining and enhancing the quality of academic processes and institutional practices. The framework ensures that academic planning, assessment, evaluation, outcome attainment, academic audit, feedback and corrective actions are implemented in a structured and evidence based manner.

The processes facilitate regular monitoring of academic performance, identification of gaps, implementation of corrective and preventive actions, and incorporation of improvements into subsequent academic cycles. Thus, the framework establishes a systematic mechanism for sustaining academic standards, ensuring compliance with prescribed requirements and promoting a culture of continuous quality improvement.

Vision

To establish a robust, transparent and outcome based quality culture that continuously enhances academic processes, institutional effectiveness and student learning outcomes.

Mission

1. **To establish systematic quality assurance mechanisms** for effective planning, implementation, monitoring and evaluation of academic processes.
 2. **To ensure transparency and consistency** in assessment, evaluation and outcome attainment through defined procedures and appropriate evidence.
 3. **To identify gaps and areas for improvement** through assessment outcomes, feedback, academic audits and stakeholder inputs.
 4. **To implement corrective and preventive actions** based on identified gaps and recommendations.
 5. **To promote evidence based decision making** through systematic documentation, analysis and periodic review.
 6. **To institutionalise continuous quality improvement** by integrating the outcomes of reviews, audits and assessments into subsequent academic and institutional planning.
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1. Strengthen community engagement and social responsibility.
 2. Develop interdisciplinary and collaborative approaches to sustainability.
 3. Encourage entrepreneurship and innovation related to sustainable development.
 4. Build faculty capacity in Education for Sustainable Development.
 5. Establish systematic monitoring and continuous improvement of SDG related initiatives.



1. Process of Defining the Department Vision

The Department Vision represents the long term aspirations and future direction of the department. It defines what the department aims to achieve in terms of academic excellence, research, innovation, professional competence, and societal contribution. A well formulated vision serves as a strategic roadmap for the department by providing a clear sense of purpose and direction to faculty, students, and other stakeholders. It aligns departmental goals with the institute's vision and supports informed decision making in academic planning, infrastructure development, faculty development, research initiatives, and industry collaboration. The vision also inspires continuous improvement, encourages innovation, and motivates stakeholders to work collectively towards achieving excellence in education and research. Furthermore, it serves as a benchmark for evaluating the department's long term progress and sustainable growth.

Step 1: Establish the Foundation

- The process begins with the **Institute Vision and Mission**, which serve as the foundation for formulating the Department Vision.

Step 2: Collect Feedback from Internal Stakeholders

- Inputs and feedback are collected from the following internal stakeholders:
 - Management
 - Faculty
 - Students

Step 3: Collect Feedback from External Stakeholders

- Feedback is simultaneously obtained from the following external stakeholders:
 - Employers
 - Alumni
 - Parents
 - Industry Experts

Step 4: Formulate the Draft Department Vision

- Based on the Institute Vision and Mission and the feedback received from internal and external stakeholders, the department prepares the draft of the **Department Vision**.

Step 5: Review by the Academic Monitoring Committee (AMC)

- The draft Department Vision is submitted to the Academic Monitoring Committee (AMC) for evaluation.
- If the draft is **approved**, it proceeds to the next stage.
- If the draft is **not approved**, it is returned to the department for revision and resubmission.

Step 6: Review by the Department Advisory Board (DAB)

- The approved draft is reviewed by the **Department Advisory Board (DAB)**.
- If the DAB recommends modifications, the draft is returned to the department for revision.
- If the draft is **approved**, it is forwarded for institutional approval.

Step 7: Approval by the Principal



- The finalized Department Vision is submitted to the **Principal** for formal approval.
- Upon approval, it becomes the official vision of the department.

Step 8: Publish the Department Vision

- After approval by the Principal, the Department Vision is disseminated through the following communication channels:
 - Institute Website
 - College Magazine
 - Notice Boards
 - Course Files

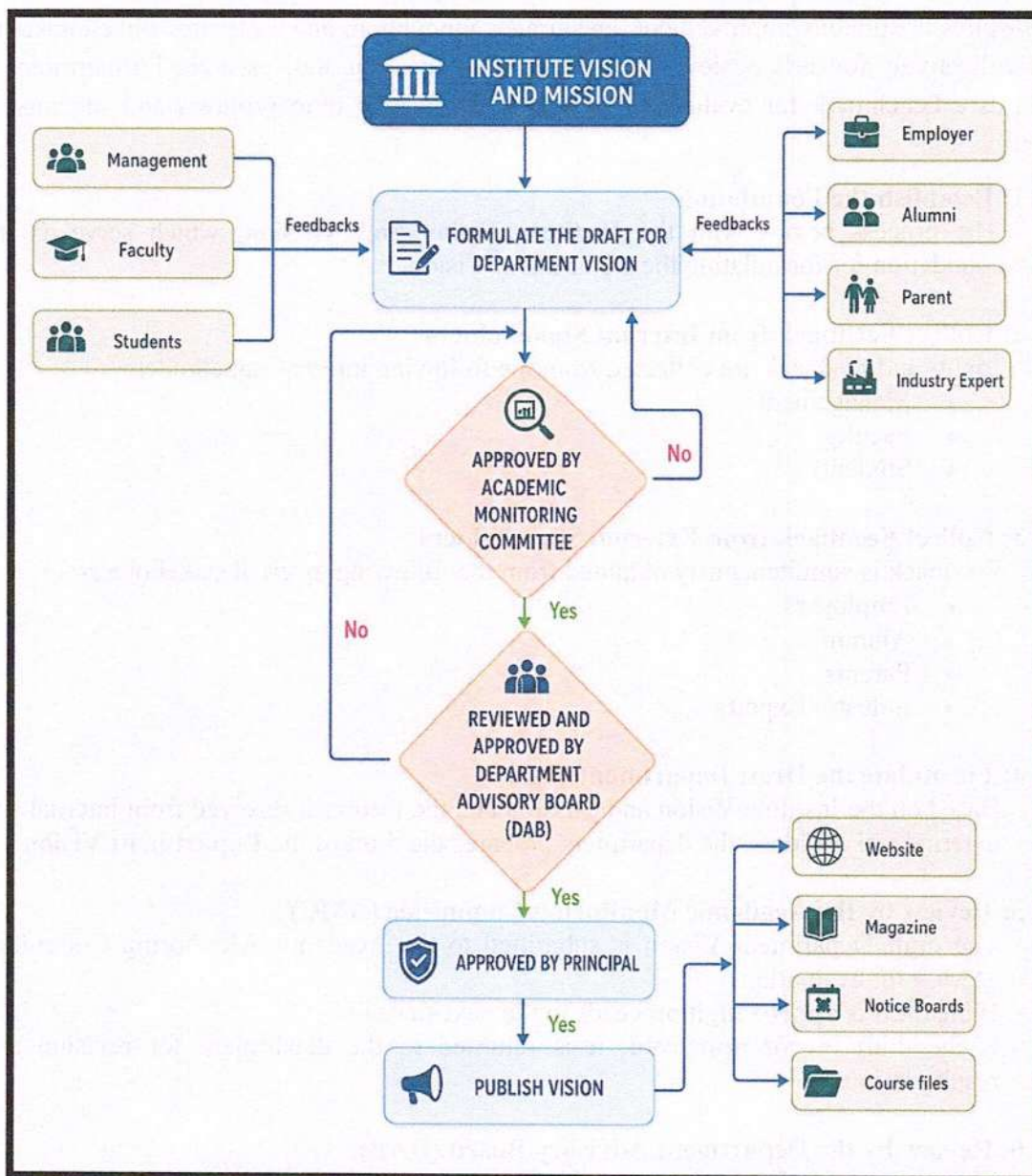


Figure.1 Flowchart of framing Vision of the Department



2. Process of Defining the Department Mission

The **Department Mission** translates the department's vision into specific objectives and actionable commitments. It explains how the department intends to achieve its vision through quality education, effective teaching learning practices, research and innovation, industry interaction, skill development, entrepreneurship, and community engagement. The mission provides a framework for planning academic activities, designing curriculum, implementing outcome based education, and promoting ethical and professional values among students. It ensures that departmental resources and efforts are directed towards fulfilling stakeholder expectations, including those of students, employers, alumni, parents, and society. A clearly defined mission also facilitates continuous assessment and quality improvement by establishing measurable goals that guide departmental policies and practices. It plays a vital role in maintaining consistency across all academic and administrative functions while supporting the overall development of competent and socially responsible graduates.

Step 1: Establish the Foundation

- The process begins by considering the **Institute Vision and Mission** and the **Department Vision** as the guiding framework for formulating the department mission.

Step 2: Collect Internal Stakeholder Feedback

- Feedback is obtained from internal stakeholders, including:
 - Management
 - Faculty
 - Students

Step 3: Collect External Stakeholder Feedback

- Feedback is gathered from external stakeholders, including:
 - Employers
 - Alumni
 - Parents
 - Industry Experts

Step 4: Formulate the Draft Department Mission

- The department prepares the draft mission by incorporating the institute's vision and mission, department vision, and stakeholder feedback.

Step 5: Review by the Academic Monitoring Committee (AMC)

- The draft mission is submitted to the Academic Monitoring Committee for evaluation.
- If **approved**, the process moves to the next stage.
- If **not approved**, the draft is returned to the department for revision.



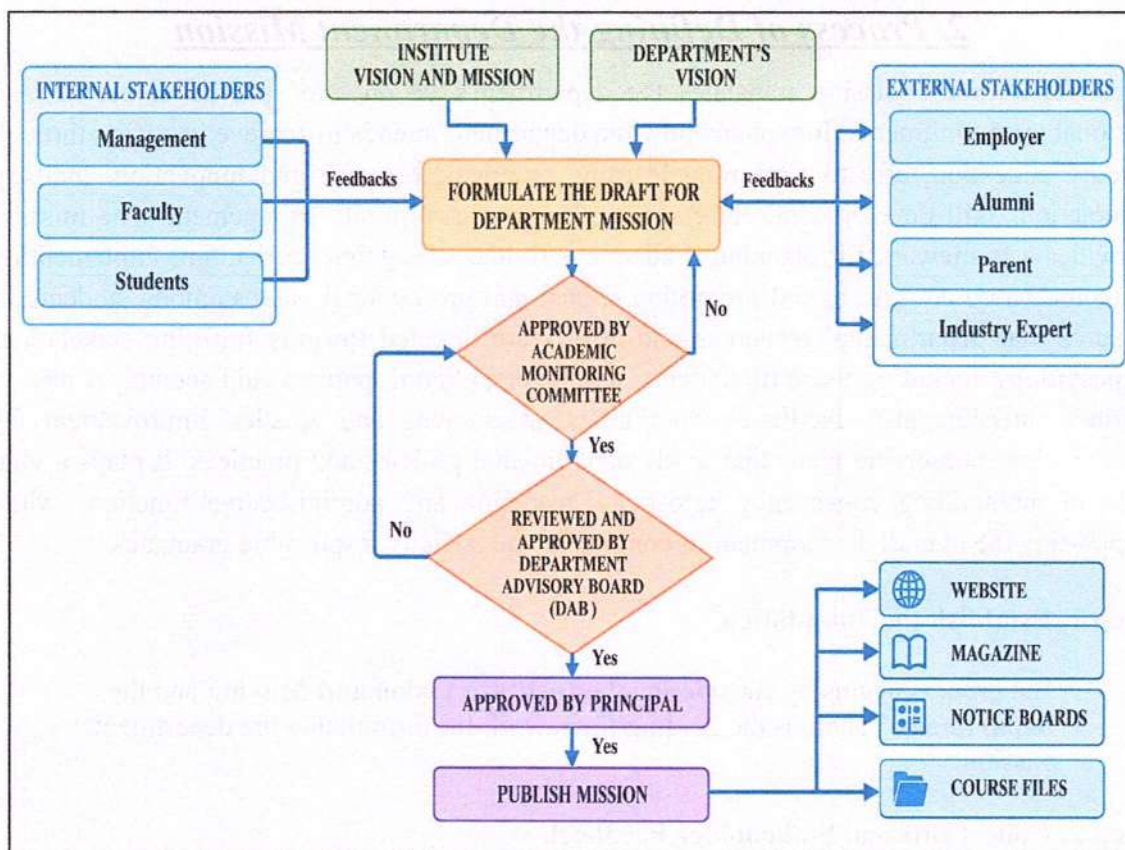


Figure.2 Flowchart of framing Mission of the Department

Step 6: Review by the Department Advisory Board (DAB)

- The revised draft is reviewed by the Department Advisory Board (DAB).
- If **approved**, the proposal proceeds for institutional approval.
- If **not approved**, it is returned to the department for necessary modifications.

Step 7: Approval by the Principal

- The finalized department mission is submitted to the Principal for formal approval.
- Upon approval, the department mission becomes the official mission statement.

Step 8: Publish the Department Mission

- The approved mission is disseminated through multiple platforms to ensure awareness among all stakeholders, including:
 - Institute Website
 - College Magazine
 - Notice Boards
 - Course Files



3. Process to Implement the Equipment Safety Policy

Objectives

The primary objective of this policy is to ensure that all equipment used in the organization is safe and reliable. This is achieved by implementing a systematic approach to equipment selection, procurement, installation, maintenance, and disposal. The policy aims to minimize the risk of equipment failure, which could lead to safety incidents, downtime, and increased costs. By adhering to this policy, the organization can ensure that its equipment is always in good working order and that its employees are protected from any potential hazards.

From a safety perspective, the policy ensures that all equipment is safe to use.

The policy also ensures that all equipment is safe to use. This is achieved by implementing a systematic approach to equipment selection, procurement, installation, maintenance, and disposal.

Step 1: Equipment Safety Policy

The first step in implementing the policy is to ensure that all equipment is safe to use. This is achieved by implementing a systematic approach to equipment selection, procurement, installation, maintenance, and disposal.

Step 2: Equipment Safety Policy

The second step in implementing the policy is to ensure that all equipment is safe to use. This is achieved by implementing a systematic approach to equipment selection, procurement, installation, maintenance, and disposal.

- The policy ensures that all equipment is safe to use.
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Step 3: Equipment Safety Policy

The third step in implementing the policy is to ensure that all equipment is safe to use. This is achieved by implementing a systematic approach to equipment selection, procurement, installation, maintenance, and disposal.

Step 4: Equipment Safety Policy

The fourth step in implementing the policy is to ensure that all equipment is safe to use. This is achieved by implementing a systematic approach to equipment selection, procurement, installation, maintenance, and disposal.



3. Process of Defining the Department Program Educational Objectives

Program Educational Objectives (PEOs) describe the expected professional accomplishments of graduates within three to five years after completing the program. They define the broad career and professional achievements that graduates are expected to attain through the knowledge, skills, and competencies acquired during their studies. PEOs provide a strong linkage between the department's mission and the long term expectations of stakeholders, ensuring that the academic program remains relevant to industry requirements, technological advancements, and societal needs. They serve as the foundation for curriculum design, Program Outcomes (POs), Course Outcomes (COs), assessment methods, and continuous quality improvement processes. PEOs also facilitate periodic evaluation of program effectiveness through feedback obtained from employers, alumni, and other stakeholders. In addition, they support the implementation of Outcome Based Education (OBE) by ensuring that graduates develop technical competence, leadership qualities, ethical values, communication skills, lifelong learning abilities, and entrepreneurial mindset.

Step 1: Define the Foundation

- The process begins with the **Department Vision and Mission**, which provide the basis for formulating the Program Educational Objectives (PEOs).

Step 2: Formulate Draft PEOs

- The department prepares the draft PEOs in alignment with the Department Vision and Mission.

Step 3: Collect Stakeholder Inputs

- Inputs and suggestions are obtained from multiple sources, including:
 - **Internal Stakeholders:** Management, Faculty, Students
 - **External Stakeholders:** Employers, Alumni, Parents, Industry Experts
 - **Institutional Inputs:** Institute Policies, Academic Regulations, Program Outcomes, Benchmarking
 - **Feedback Channels:** Meetings, Surveys, Email, Online Forms, Workshops, and Interactions

Step 4: Analyse Feedback

- The collected feedback is compiled, analyzed, and evaluated to determine the required modifications to the draft PEOs.

Step 5: Revise the Draft PEOs

- Based on the analysis of stakeholder feedback, the department revises the draft PEOs to ensure alignment with institutional objectives and stakeholder expectations.



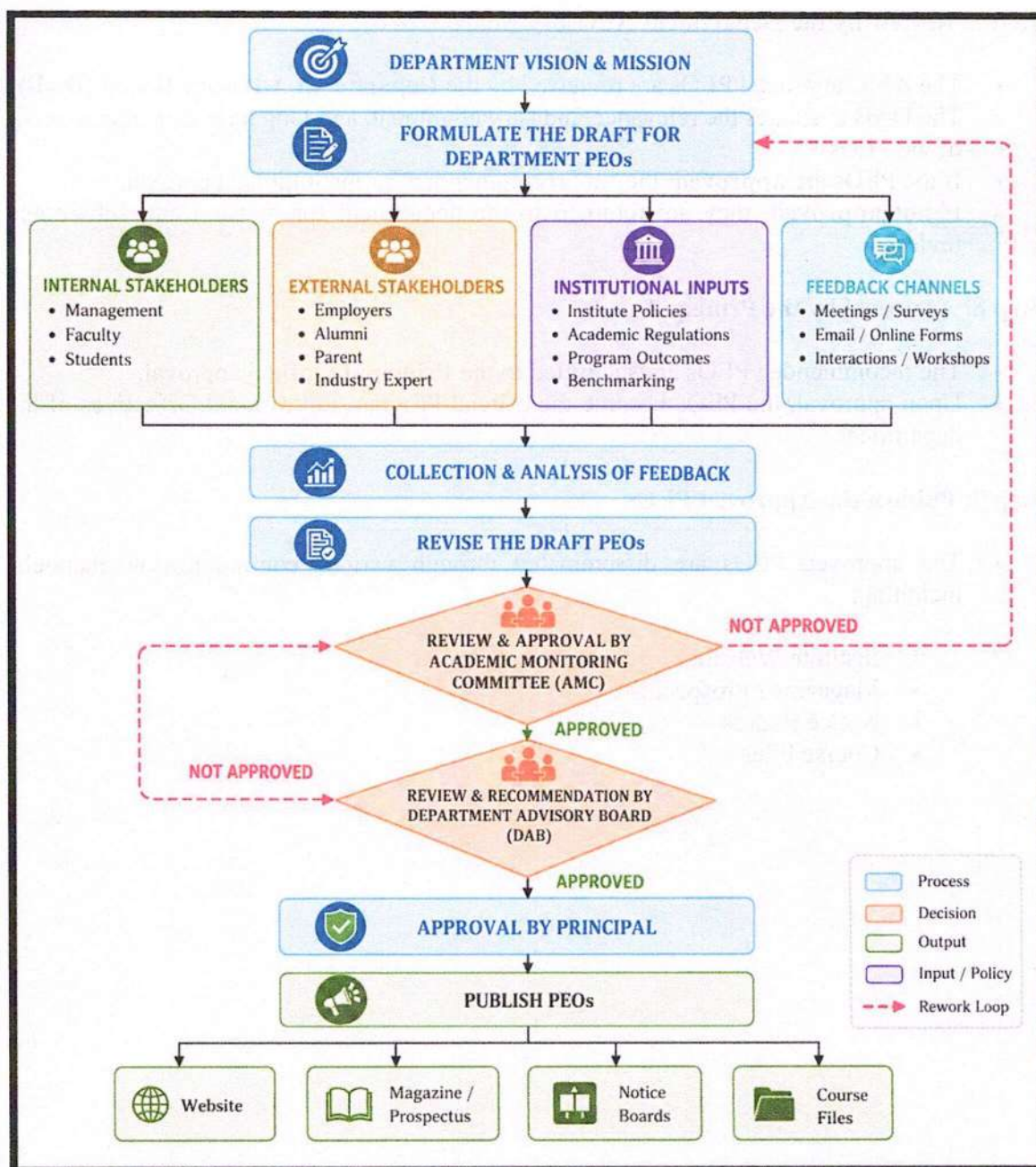


Figure.3 Flowchart of framing PEO'S of the Department

Step 6: Review by the Academic Monitoring Committee (AMC)

- The revised PEOs are submitted to the Academic Monitoring Committee (AMC) for review and approval.
- If the PEOs are **approved**, they proceed to the next stage.
- If **not approved**, they are returned to the department for further revision and resubmission.



Step 7: Review by the Department Advisory Board (DAB)

- The AMC approved PEOs are reviewed by the **Department Advisory Board (DAB)**.
- The DAB evaluates the relevance, industry alignment, and long term educational goals of the PEOs.
- If the PEOs are **approved**, they are recommended for institutional approval.
- If **not approved**, they are returned to the department for revision and subsequent review.

Step 8: Approval by the Principal

- The recommended PEOs are submitted to the **Principal** for final approval.
- Upon approval, the PEOs become the official Program Educational Objectives of the department.

Step 9: Publish the Approved PEOs

- The approved PEOs are disseminated through various communication channels, including:
 - Institute Website
 - Magazine / Prospectus
 - Notice Boards
 - Course Files



4. Process to identify the curricular gaps in the attainment of the POs and PSOs.

The **Curriculum Gap Identification Process** is an essential component of Outcome Based Education (OBE) that ensures the curriculum remains relevant, effective, and aligned with stakeholder expectations. The process systematically identifies deficiencies in the curriculum through Course Outcome (CO) attainment analysis and academic review, enabling the department to implement appropriate improvement strategies. It facilitates evidence based decision making by utilizing assessment data and feedback to enhance curriculum delivery, teaching learning practices, and student learning outcomes. The process also promotes the integration of emerging technologies, industry requirements, and professional skills through activities such as workshops, expert lectures, and industrial visits, value added courses, and curriculum revision. By continuously monitoring the effectiveness of these interventions and reassessing CO attainment, the department fosters a culture of continuous quality improvement.

Step 1: Define Course Outcomes (COs) and Map with Program Outcomes (POs)

- Define the Course Outcomes (COs) for each course and establish their mapping with the Program Outcomes (POs). This forms the foundation for measuring the effectiveness of the curriculum and achieving Outcome Based Education (OBE).

Step 2: Conduct Teaching Learning and Assessment

- Deliver the curriculum through appropriate teaching learning methodologies and conduct continuous internal and external assessments to evaluate student performance and attainment of the defined Course Outcomes.

Step 3: Measure Course Outcome (CO) Attainment

- Analyze assessment data to determine the attainment level of each Course Outcome. The attainment analysis helps identify areas where the expected learning outcomes are not achieved satisfactorily.

Step 4: Review by the Academic Monitoring Committee (AMC)

- The Academic Monitoring Committee reviews the CO attainment results along with academic performance and identifies curriculum gaps, deficiencies, or areas requiring improvement.

Step 5: Identify Curriculum Gap

- Based on the AMC review, a decision is made regarding the existence of curriculum gaps.
 - **If no gap is identified**, the department continues regular monitoring of the teaching learning process and periodic assessment.
 - **If a gap is identified**, appropriate curriculum improvement actions are planned and implemented.



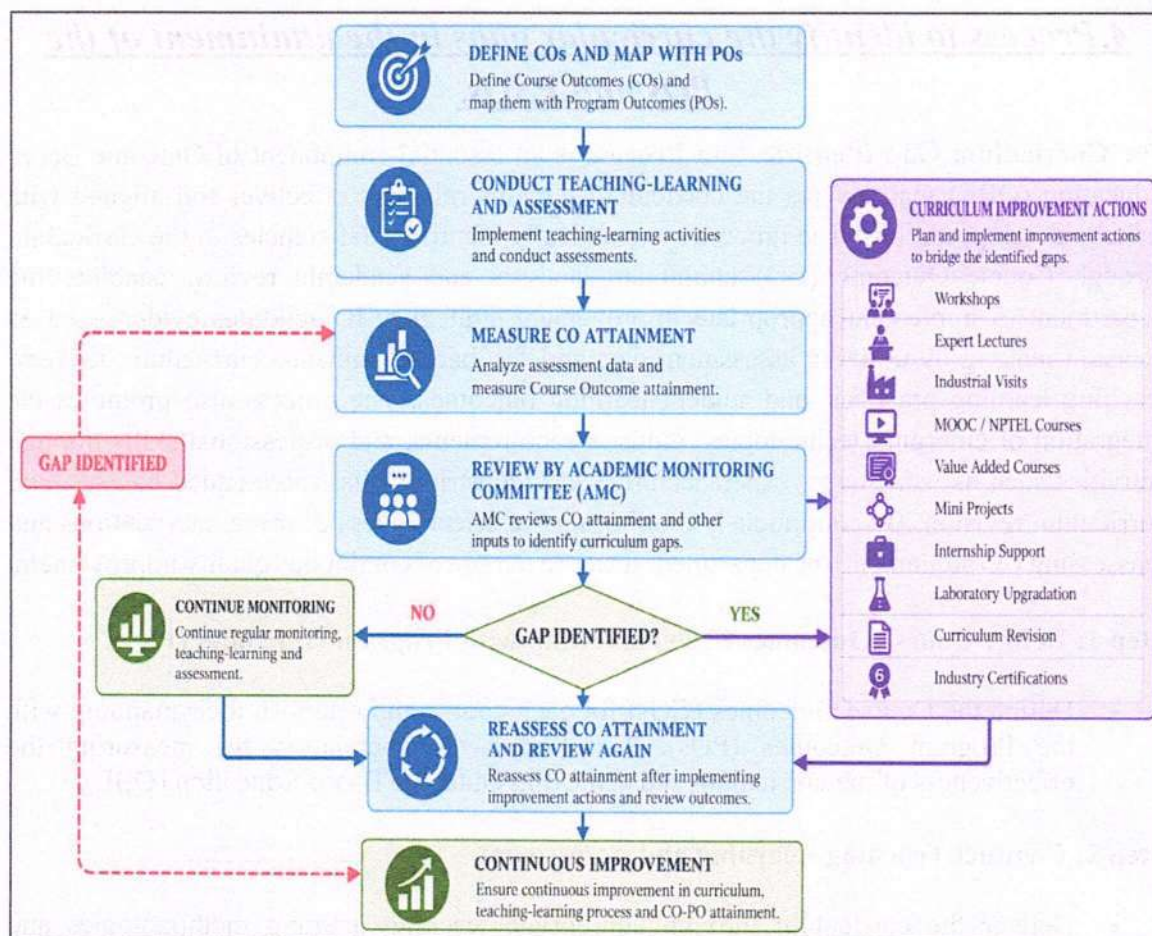


Figure.4 Flowchart of identification of the curricular gaps

Step 6: Implement Curriculum Improvement Actions

- The department undertakes suitable actions to bridge the identified curriculum gaps. These actions may include:
 - Workshops
 - Expert Lectures
 - Industrial Visits
 - MOOC/NPTEL Courses
 - Value Added Courses
 - Mini Projects
 - Internship Support
 - Laboratory Up gradation
 - Curriculum Revision
 - Industry Certifications

Step 7: Reassess CO Attainment and Review

- After implementing the improvement actions, the department reassesses the Course Outcome attainment using subsequent assessment data. The effectiveness of the



implemented actions is reviewed to determine whether the identified gaps have been successfully addressed.

Step 8: Continuous Improvement

- The findings from the reassessment are utilized for continuous improvement of the curriculum, teaching learning process, laboratory facilities, and academic practices. This cyclical process ensures sustained enhancement of CO and PO attainment and supports the continuous quality improvement philosophy of Outcome Based Education (OBE).



5. Adherence to academic calendar

The **Department Academic Calendar and Course Planning Process** provides a systematic framework for planning, organizing, implementing, and monitoring all academic activities throughout the academic year. It ensures that departmental activities are aligned with the University and Institute Academic Calendars while facilitating the timely execution of teaching learning, assessment, co-curricular, and extracurricular activities. The process promotes effective coordination among faculty members, optimal utilization of academic resources, and structured implementation of the curriculum through comprehensive course planning. It also supports Outcome Based Education (OBE) by ensuring that Course Outcomes (COs) are delivered and assessed as planned. Regular monitoring by the Academic Monitoring Committee (AMC) enables timely identification of deviations, implementation of corrective actions, and continuous improvement of academic processes.

Step 1: University Academic Calendar

- The process begins with the **University Academic Calendar**, which specifies the academic schedule, including commencement of semesters, examinations, holidays, and other academic activities.

Step 2: Prepare the Institute Academic Calendar

- Based on the University Academic Calendar, the institute prepares its **Institute Academic Calendar** by incorporating institutional events, administrative activities, and academic schedules applicable to all departments.

Step 3: Conduct the Department Planning Meeting

- The department conducts a planning meeting involving the HoD, Academic Coordinator, faculty members, and other coordinators to finalize the academic activities, responsibilities, and timelines for the semester.

Step 4: Prepare the Department Academic Calendar

- The department prepares a comprehensive **Department Academic Calendar** by integrating all planned academic activities, including:
 - Academic Activities
 - Expert Lectures
 - Industrial Visits
 - Internship Activities
 - Internal Examinations
 - Project Reviews
 - Value Added and Add on Courses
 - Co-curricular and Extracurricular Activities



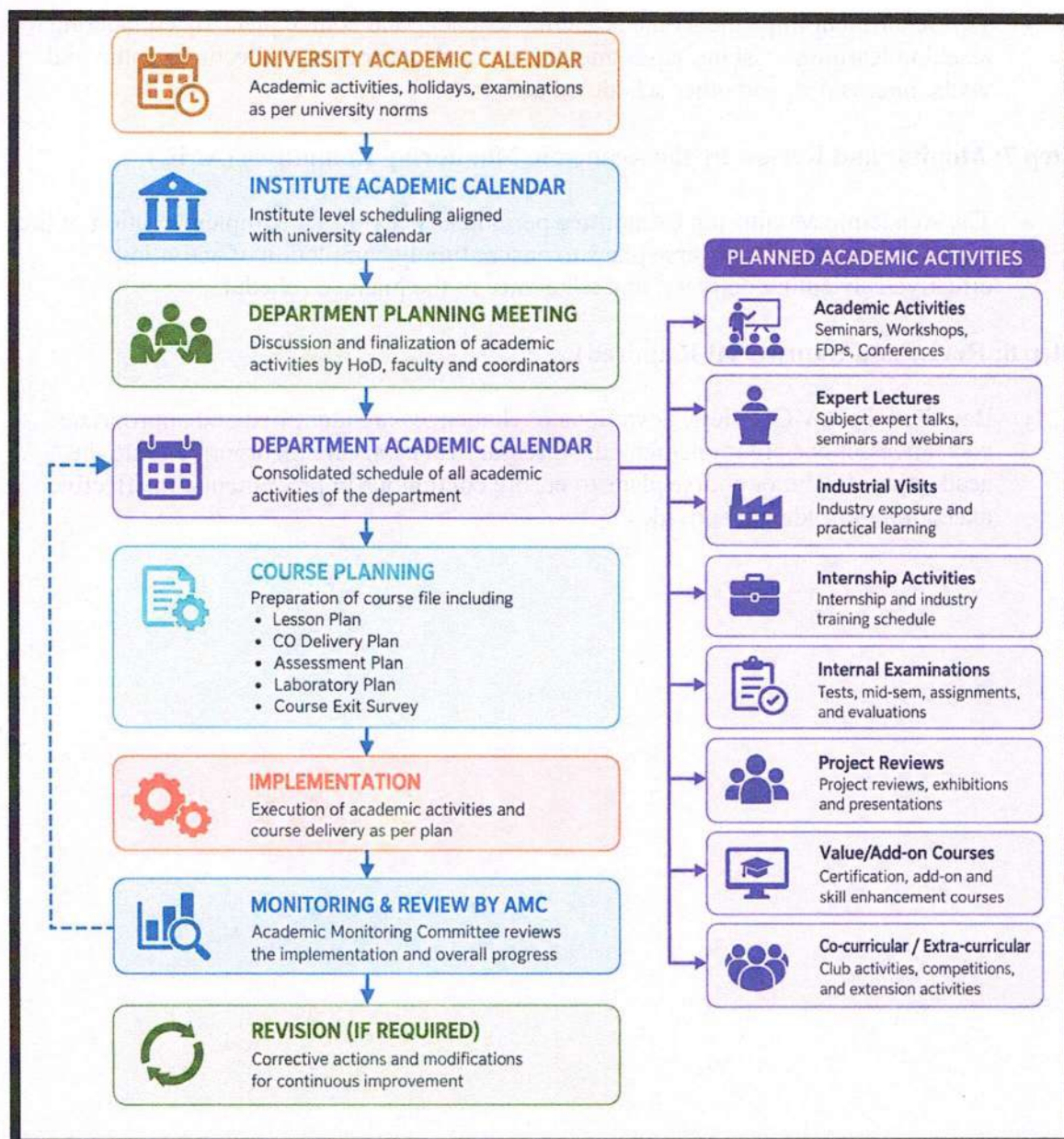


Figure 5: Flow Diagram of Academic Calendar Preparation

Step 5: Prepare Course Planning

- Each course instructor prepares a detailed **Course Plan** comprising:
 - Lesson Plan
 - CO Delivery Plan
 - Assessment Plan
 - Laboratory Plan (where applicable)
 - Course Exit Survey Plan

Step 6: Implement Academic Activities



- The department implements the academic calendar and course plans by conducting teaching learning sessions, assessments, laboratory work, expert lectures, industrial visits, internships, and other scheduled activities.

Step 7: Monitor and Review by the Academic Monitoring Committee (AMC)

- The Academic Monitoring Committee periodically reviews the implementation of the academic calendar and course plans to ensure timely completion of activities, effective curriculum delivery, and adherence to the planned schedule.

Step 8: Revise and Improve (If Required)

- Based on the AMC review, deviations or challenges are identified and appropriate corrective actions are implemented. Necessary revisions are incorporated into the academic calendar or course plans to ensure continuous improvement and effective execution of academic activities.



6. Course Planning Mechanism

The **Course Planning, Verification, Approval and Delivery Process** provides a systematic framework for planning, documenting, reviewing, approving, and implementing every course offered by the department. The process ensures that course delivery is aligned with the prescribed syllabus, curriculum structure, institutional vision and mission, and Outcome Based Education (OBE) requirements. It facilitates the preparation of comprehensive course files containing Course Outcomes (COs), CO to PO/PSO mapping, lesson plans, assessment plans, learning materials, and other essential academic documents. The verification and approval mechanism ensures the completeness, accuracy, and quality of course documentation before the commencement of teaching. By integrating structured planning with academic review, the process promotes uniformity in course delivery, effective assessment, timely syllabus completion, and continuous quality improvement.

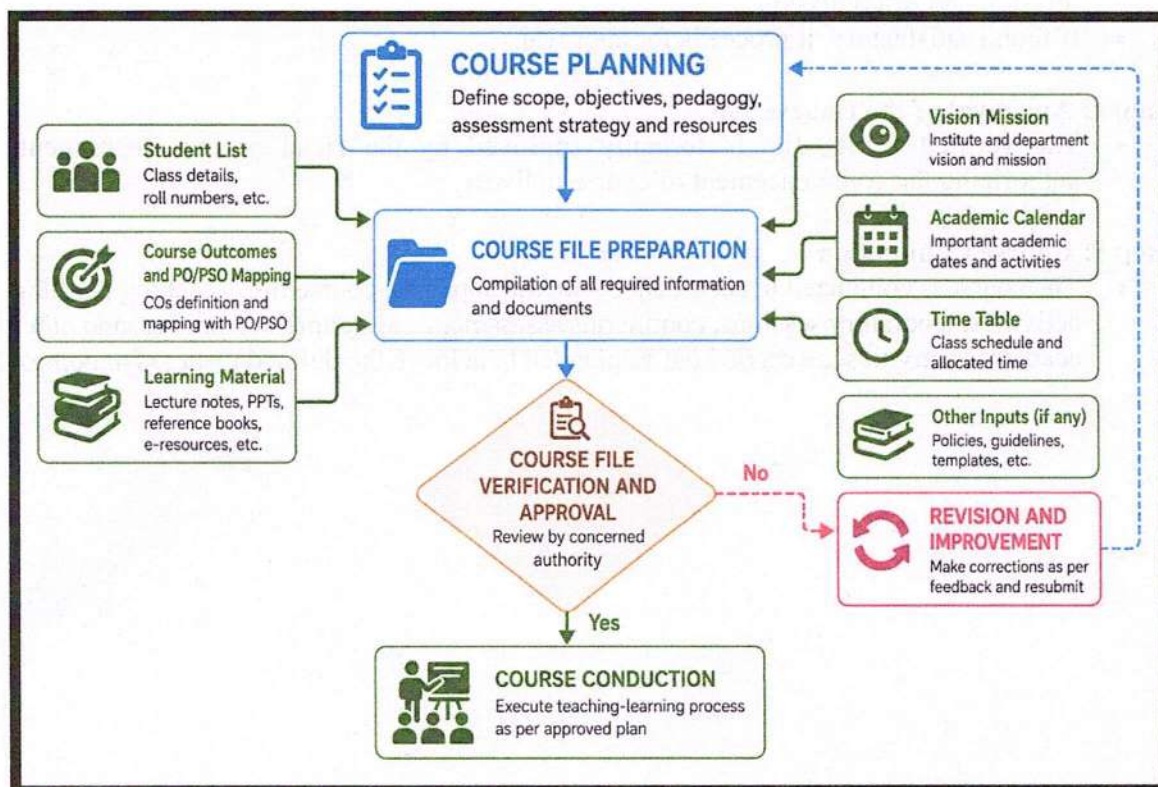


Figure 6 Flow Diagram of Course Planning

Step 1: Course Planning

- The course instructor prepares the course plan by understanding the course objectives, syllabus, Course Outcomes (COs), pedagogy, assessment strategy, and resource requirements for effective course delivery.

Step 2: Prepare the Course File

- The course file is prepared by compiling all the required academic documents using the following inputs:
 - University/Institute Syllabus
 - Programme Curriculum



- Institute and Department Vision and Mission
- Academic Calendar
- Time Table
- Student List
- Course Outcomes (COs) and PO/PSO Mapping
- Learning Materials
- Assessment Plan (CA, MSE, ESE, Assignments, Quizzes, and Laboratory Assessment)

Step 3: Verification of the Course File

- The prepared course file is reviewed by the Academic Coordinator and/or Head of the Department to verify its completeness, accuracy, compliance with academic regulations, and alignment with Outcome Based Education requirements.
- If deficiencies are identified, the course file is returned to the course instructor for revision and resubmission.
- If found satisfactory, it proceeds for approval.

Step 4: Approval of the Course File

- The verified course file is formally approved by the Head of the Department, authorizing the commencement of course delivery.

Step 5: Course Conduction

- The course is conducted in accordance with the approved course file. Teaching learning activities, laboratory sessions, continuous assessments, assignments, quizzes, and other academic activities are carried out as planned to achieve the defined Course Outcomes.



7. Instruction methods using Pedagogical Initiatives

7.1. Experiential Learning

Experiential Learning is a student centered teaching and learning approach that emphasizes learning through direct experience, practical application, and reflection. It bridges the gap between theoretical knowledge and real world practice by providing students with opportunities to apply classroom concepts in professional and industrial environments. Experiential learning enhances technical competence, problem solving ability, critical thinking, teamwork, communication skills, and professional ethics. It also improves students' employability by exposing them to current industrial practices, emerging technologies, and workplace culture.

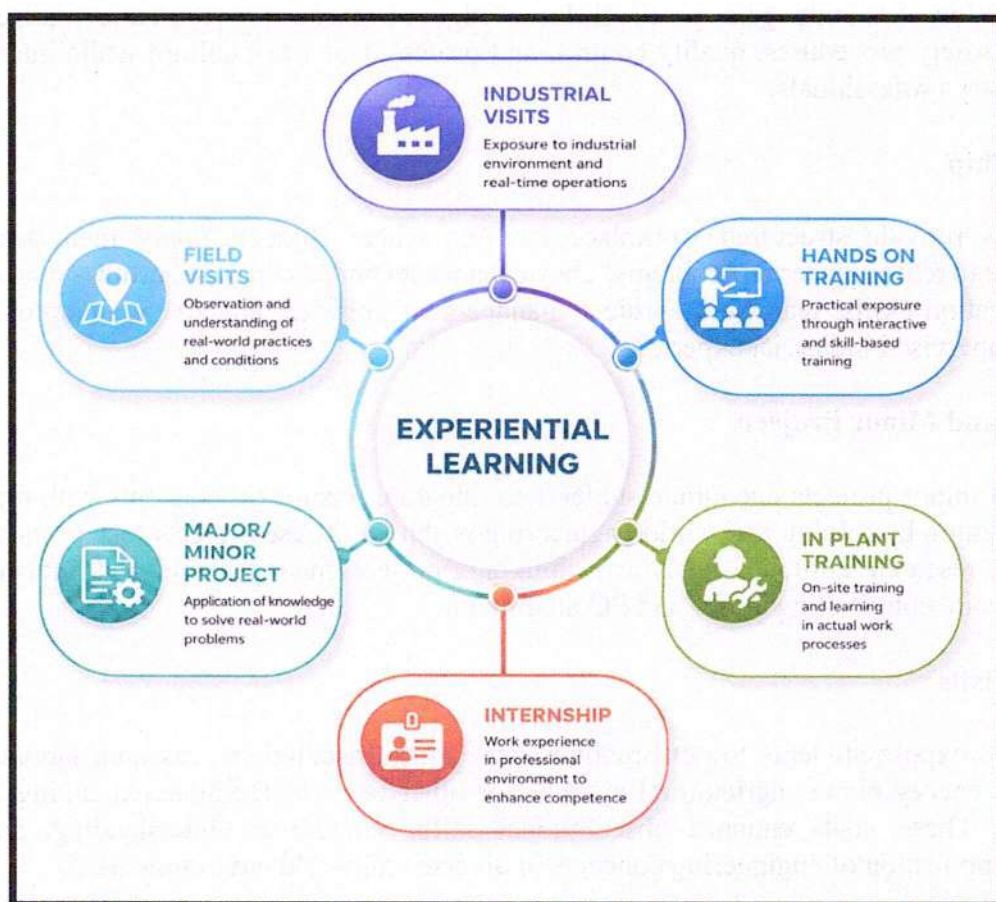


Figure 7.1 Experiential Learning Methods

Components of Experiential Learning

1. Industrial Visits

Industrial visits provide students with first hand exposure to industrial operations, manufacturing processes, quality systems, and organizational practices. They help students



understand the practical implementation of engineering concepts and bridge the gap between classroom learning and industrial applications.

2. Hands on Training

Hands on training enables students to acquire practical skills through laboratory exercises, workshops, simulation tools, equipment handling, and skill based training programs. It strengthens conceptual understanding and develops technical competency through active participation.

3. In Plant Training

In plant training offers students the opportunity to work within an industrial environment for a short duration. Students gain practical knowledge of production systems, maintenance practices, safety procedures, quality control, and professional work culture while interacting with industry professionals.

4. Internship

Internships provide structured workplace learning where students apply their academic knowledge to real engineering problems. They enhance technical expertise, professional ethics, communication skills, teamwork, project management abilities, and overall employability through supervised industrial experience.

5. Major and Minor Projects

Major and minor projects encourage students to integrate theoretical concepts with practical implementation by solving real world engineering problems. These projects foster innovation, creativity, research aptitude, analytical thinking, project management, and independent learning while contributing to CO and PO attainment.

6. Field Visits

Field visits expose students to construction sites, utility installations, research laboratories, renewable energy plants, agricultural systems, or other relevant facilities depending on the discipline. These visits enhance observational skills, contextual understanding, and the practical application of engineering concepts in diverse real world environments.

➤ Expected Outcomes

The implementation of experiential learning is expected to achieve the following outcomes:

- Enhanced practical knowledge and technical competence.
- Improved problem solving, analytical, and critical thinking skills.
- Better understanding of industrial processes and professional practices.
- Increased innovation, creativity, and research aptitude.
- Strengthened communication, teamwork, and leadership skills.
- Improved employability and industry readiness.
- Enhanced attainment of Course Outcomes (COs), Program Outcomes (POs), and Program Specific Outcomes (PSOs).



- Promotion of lifelong learning, ethical practices, and continuous professional development.
- Stronger industry institute interaction and stakeholder engagement.

7.2. Participative Learning

Participative Learning is a student centered teaching and learning approach that actively involves students in the learning process through discussion, collaboration, presentation, analysis, and knowledge sharing. Unlike conventional lecture based instruction, participative learning encourages students to become active contributors rather than passive recipients of knowledge. It promotes critical thinking, problem solving, communication, teamwork, and self-directed learning by engaging students in meaningful academic activities. Participative learning enhances conceptual understanding, improves student motivation, and develops confidence by providing opportunities to exchange ideas, present solutions, and learn from peers and experts.



Figure 7.2 Participative Learning Methods

Components of Participative Learning

1. Laboratory Experiments and Lab Practice



Laboratory experiments and practical sessions enable students to actively participate in applying theoretical concepts through experimentation, observation, and analysis. They strengthen practical knowledge, technical skills, and scientific inquiry while enhancing conceptual understanding.

2. Seminar and Poster Presentation

Seminars and poster presentations provide students with opportunities to study emerging topics, organize technical information, and communicate their ideas effectively. These activities improve presentation skills, confidence, research aptitude, and technical communication.

3. NPTEL, Coursera, and Udemmy Courses

Online learning platforms encourage students to acquire additional knowledge beyond the prescribed curriculum through self paced learning. These courses help students develop technical competencies, interdisciplinary knowledge, industry relevant skills, and lifelong learning habits.

4. Value Added Courses

Value added courses complement the regular curriculum by providing specialized training in emerging technologies, professional skills, and industry oriented topics. They enhance employability, technical competence, and career readiness.

5. Expert and Guest Lectures

Expert and guest lectures expose students to current industrial practices, technological advancements, research developments, and professional experiences. Interaction with experts broadens students' perspectives and bridges the gap between academic learning and industry expectations.

6. Case Studies

Case studies encourage students to analyze real world engineering problems, evaluate alternative solutions, and apply theoretical knowledge to practical situations. They strengthen analytical thinking, decision making, creativity, and problem solving abilities.

➤ Expected Outcomes

The implementation of participative learning is expected to achieve the following outcomes:

- Enhanced student engagement and active participation in the learning process.
- Improved conceptual understanding and practical application of engineering principles.
- Development of critical thinking, analytical reasoning, and problem solving skills.
- Enhanced communication, presentation, teamwork, and leadership abilities.
- Increased research aptitude, creativity, and innovation.
- Improved technical competence through exposure to emerging technologies and online learning platforms.



- Better attainment of Course Outcomes (COs), Program Outcomes (POs), and Program Specific Outcomes (PSOs).
- Promotion of lifelong learning, self-directed learning, and professional development.
- Enhanced employability, industry readiness, and overall academic performance.

7.3. Active Learning

Active Learning is a student centered instructional approach that actively engages students in the learning process through discussion, reflection, questioning, problem solving, and collaborative activities. Unlike traditional lecture based teaching, active learning encourages students to think critically, analyze concepts, and participate in classroom activities rather than passively receiving information. It promotes deeper understanding by involving students in meaningful learning experiences that require them to apply knowledge, communicate ideas, and evaluate different perspectives. Active learning enhances motivation, curiosity, and classroom interaction while developing higher order cognitive skills such as critical thinking, creativity, decision making, and problem solving.



Figure 7.3 Active Learning Methods



Components of Active Learning

1. Think Pair Share

Think Pair Share encourages students to think individually about a problem, discuss their ideas with a partner, and then share their conclusions with the class. This activity promotes active participation, communication, collaborative thinking, and deeper conceptual understanding.

2. Interactive Questioning

Interactive questioning involves asking thought provoking questions during classroom instruction to stimulate curiosity, encourage discussion, and assess students' understanding. It develops critical thinking, analytical reasoning, and active classroom engagement.

3. Concept Mapping

Concept mapping enables students to organize and connect related concepts using graphical representations. This activity enhances conceptual understanding, knowledge integration, and the ability to visualize relationships among different topics.

4. Quiz Activities

Quiz activities provide immediate opportunities for students to recall, apply, and evaluate knowledge through short assessments. They reinforce learning, provide instant feedback, improve retention, and help instructors monitor student understanding.

5. One Minute Paper

The One Minute Paper is a brief reflective activity in which students summarize the most important concepts learned or identify areas requiring clarification. It promotes self reflection, reinforces learning, and provides valuable feedback to instructors.

6. Brainstorming

Brainstorming encourages students to generate multiple ideas, explore alternative solutions, and discuss different perspectives without immediate evaluation. It enhances creativity, innovation, teamwork, and problem solving abilities.

➤ Expected Outcomes

The implementation of active learning is expected to achieve the following outcomes:

- Enhanced student engagement and classroom participation.
- Improved conceptual understanding and knowledge retention.
- Development of critical thinking, analytical reasoning, and problem solving skills.
- Strengthened communication, collaboration, and interpersonal skills.
- Increased creativity, innovation, and independent thinking.
- Improved self reflection and continuous learning through regular feedback.
- Better attainment of Course Outcomes (COs), Program Outcomes (POs), and Program Specific Outcomes (PSOs).



- Enhanced confidence, motivation, and lifelong learning abilities.
- Improved academic performance and overall effectiveness of the teaching learning process.

7.4. Collaborative Learning

Collaborative Learning is a student centered teaching and learning approach in which students work together in groups to achieve common learning objectives through shared responsibility, mutual interaction, and collective problem solving. It encourages students to actively exchange ideas, discuss concepts, share knowledge, and learn from one another while completing academic tasks. Collaborative learning promotes deeper understanding of subject matter by integrating diverse perspectives and fostering teamwork, communication, leadership, and interpersonal skills. It also develops critical thinking, decision making, conflict resolution, and accountability, preparing students to work effectively in multidisciplinary and professional environments.

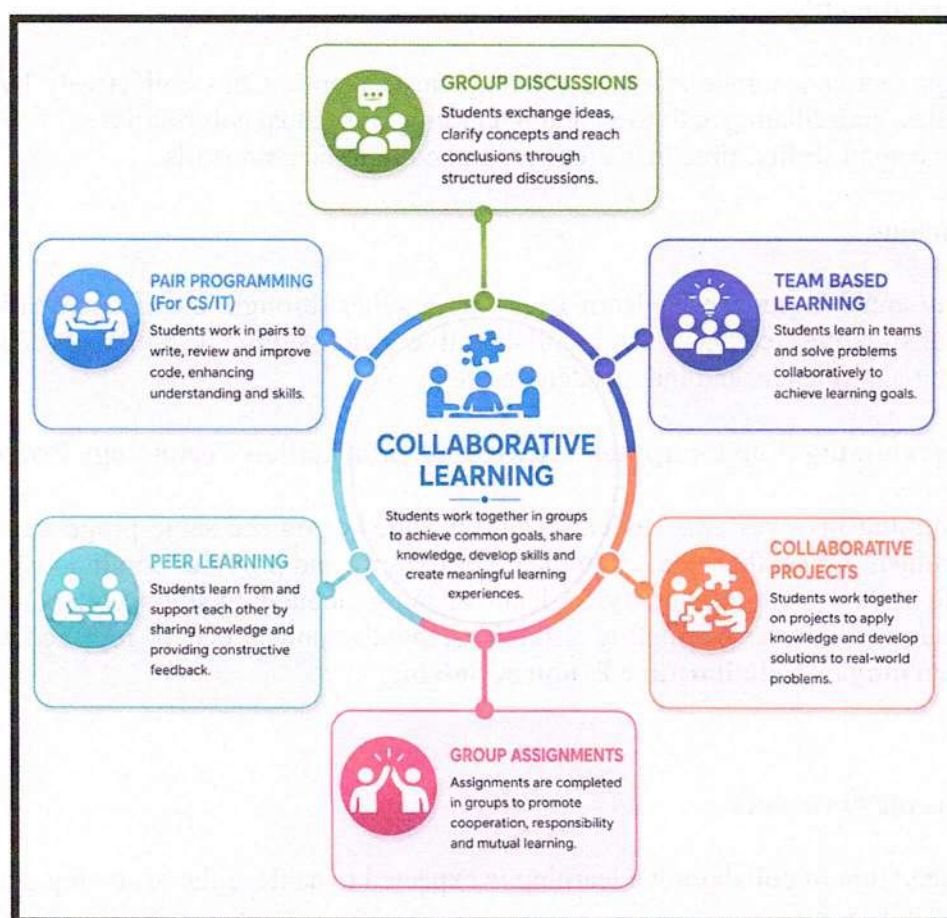


Figure 7.4 Collaborative Learning Methods



Components of Collaborative Learning

1. Group Discussions

Group discussions provide students with opportunities to exchange ideas, clarify concepts, and analyze different viewpoints on a given topic. They promote active participation, critical thinking, effective communication, and collaborative decision making.

2. Team Based Learning

Team Based Learning involves students working in structured teams to solve problems, complete assignments, and apply theoretical knowledge to practical situations. It enhances teamwork, leadership, accountability, and collaborative problem solving skills.

3. Collaborative Projects

Collaborative projects require students to work together in planning, designing, implementing, and presenting solutions to real world engineering problems. These projects foster innovation, project management, technical competence, and interdisciplinary learning.

4. Group Assignments

Group assignments encourage students to complete academic tasks collectively by sharing responsibilities, coordinating activities, and integrating individual contributions. They develop cooperation, responsibility, time management, and communication skills.

5. Peer Learning

Peer learning enables students to learn from one another through knowledge sharing, peer teaching, constructive feedback, and collaborative discussions. It reinforces conceptual understanding, confidence, and independent learning.

6. Pair Programming (For Computer Science and Information Technology Programs)

Pair programming involves two students working together on the same programming task, where one student writes the code while the other reviews and provides continuous feedback. This practice improves coding quality, logical reasoning, debugging skills, collaboration, and knowledge sharing. For non computing disciplines, this component may be replaced with **Peer Assisted Learning** or **Collaborative Problem Solving**.

➤ Expected Outcomes

The implementation of collaborative learning is expected to achieve the following outcomes:

- Enhanced teamwork, cooperation, and interpersonal skills.
- Improved communication, leadership, and collaborative decision making.
- Better conceptual understanding through peer interaction and knowledge sharing.
- Development of critical thinking, analytical reasoning, and problem solving abilities.



- Increased student engagement, participation, and accountability in the learning process.
- Enhanced creativity, innovation, and multidisciplinary learning.
- Improved attainment of Course Outcomes (COs), Program Outcomes (POs), and Program Specific Outcomes (PSOs).
- Strengthened professional ethics, mutual respect, and lifelong learning skills.
- Improved employability and preparedness for collaborative professional environments.



8. Quality of Laboratory Experience With Regard To Conducting Experiments



Figure 8: Process of Maintaining Quality in Conducting Laboratory Experiments

► Well Equipped Laboratories as per University Curriculum

- The department provides well equipped laboratories with modern instruments, equipment, software, and facilities as prescribed in the university curriculum.
- Laboratory infrastructure is periodically upgraded to incorporate emerging technologies and meet academic and industry requirements.
- Regular maintenance and calibration of laboratory equipment are carried out to ensure accuracy, reliability, and uninterrupted laboratory operations.

► Preparation and Distribution of Laboratory Manuals

- A comprehensive laboratory manual is prepared for each laboratory course in accordance with the prescribed syllabus.
- The manual includes course objectives, Course Outcomes (COs), list of experiments, learning objectives, experimental procedures, observation formats, result analysis, viva questions, and safety precautions.
- Laboratory manuals are made available to students at the beginning of the semester to facilitate effective preparation and uniform conduct of experiments.

► Conduct of Laboratory Experiments



- Laboratory sessions are conducted according to the approved academic calendar and laboratory schedule.
- Faculty members explain the objectives, procedures, safety guidelines, and expected outcomes before the commencement of each experiment.
- Students perform experiments individually or in groups under faculty supervision while following standard laboratory practices and safety protocols.
- Faculty members provide continuous guidance to ensure effective practical learning and attainment of Course Outcomes.

► Continuous Assessment of Laboratory Performance

- Student performance is continuously evaluated through practical execution, laboratory records, observations, viva voce examinations, assignments, and practical tests.
- Continuous assessment enables timely identification of learning gaps and provides opportunities for improvement through constructive feedback.
- Student feedback regarding laboratory facilities, experiments, and teaching methodologies is collected and utilized for continuous improvement.

► Maintenance of Laboratory Records

The department systematically maintains the following laboratory records to ensure effective laboratory management and documentation:

- Laboratory Attendance Register
- Dead Stock Register
- Consumable Stock Register
- Equipment Maintenance Register
- Equipment Calibration Reports (where applicable)
- Laboratory Timetable



9. Methodologies to assist slow students and encourage bright students

The **Fast Learner and Slow Learner Identification and Support Process** is a systematic mechanism adopted by the department to identify students based on their academic performance and learning pace, and to provide appropriate academic interventions. The process ensures that every student receives suitable learning opportunities according to their individual needs. Fast learners are encouraged through advanced learning activities, research, innovation, and competitive platforms, while slow learners receive remedial instruction, mentoring, additional practice sessions, and continuous academic support. This student centric approach promotes inclusive education, improves academic performance, enhances Course Outcome (CO) and Program Outcome (PO) attainment, and supports the principles of Outcome Based Education (OBE).

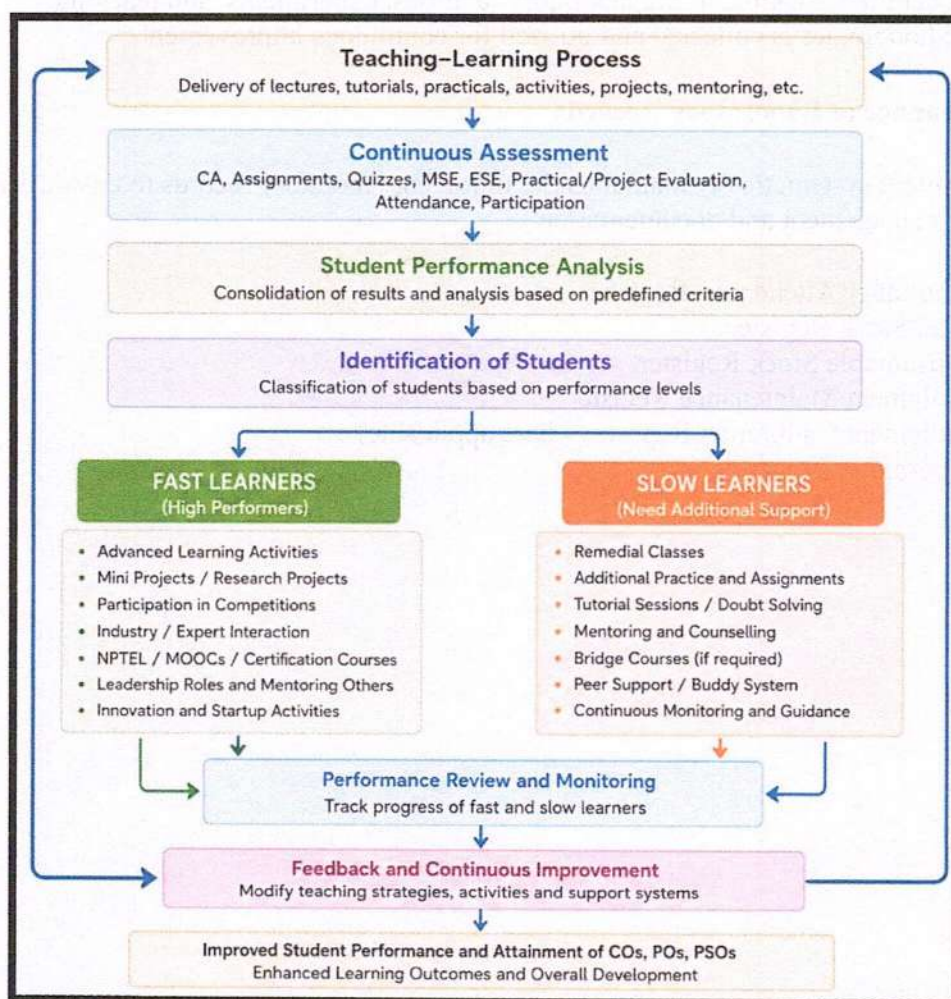


Figure 9: Process of identifying slow & fast learners



Steps of the Process

Step 1: Teaching Learning Process

- The process begins with the regular teaching learning activities, including classroom lectures, tutorials, laboratory sessions, project based learning, mentoring, and other academic activities conducted according to the academic calendar and course plan.

Step 2: Continuous Assessment

- Students are continuously evaluated through various assessment components such as Continuous Assessment (CA), assignments, quizzes, Mid Semester Examination (MSE), End Semester Examination (ESE), practical examinations, project evaluation, attendance, and classroom participation. These assessments provide comprehensive evidence of students' academic performance.

Step 3: Student Performance Analysis

- The assessment results are consolidated and analyzed by the course faculty to evaluate the academic performance of each student. Performance analysis helps identify students' strengths, weaknesses, and overall learning progress.

Step 4: Identification of Students

- Based on predefined academic performance criteria established by the department, students are categorized as **Fast Learners** or **Slow Learners**.
 - **Fast Learners** are students who consistently demonstrate high academic performance, quick conceptual understanding, and the ability to undertake advanced learning activities.
 - **Slow Learners** are students who require additional academic support to improve their understanding and performance.

Step 5: Academic Support for Fast Learners

- The department provides enrichment opportunities to fast learners through:
 - Advanced learning activities
 - Mini projects and research projects
 - Participation in technical competitions
 - Industry interaction and expert lectures
 - NPTEL, MOOCs, and certification courses
 - Leadership responsibilities and peer mentoring
 - Innovation, entrepreneurship, and startup activities

Step 6: Academic Support for Slow Learners

- The department provides targeted academic support to slow learners through:
 - Remedial classes
 - Additional practice sessions and assignments



- Tutorial classes and doubt solving sessions
- Faculty mentoring and academic counselling
- Bridge courses, wherever required
- Peer support and buddy system
- Continuous monitoring and personalized guidance

Step 7: Performance Review and Monitoring

- The progress of both fast learners and slow learners is periodically monitored through subsequent assessments, faculty observations, mentoring records, and academic reviews. The effectiveness of the support initiatives is evaluated to ensure continuous academic improvement.

Step 8: Feedback and Continuous Improvement

- Based on the review of student performance, faculty feedback, and academic outcomes, the department revises teaching strategies, learning activities, mentoring practices, and support mechanisms. The findings are utilized to continuously improve the teaching learning process and enhance student success.



10. Feedback on Teaching and Learning Process and Corrective Measures Taken

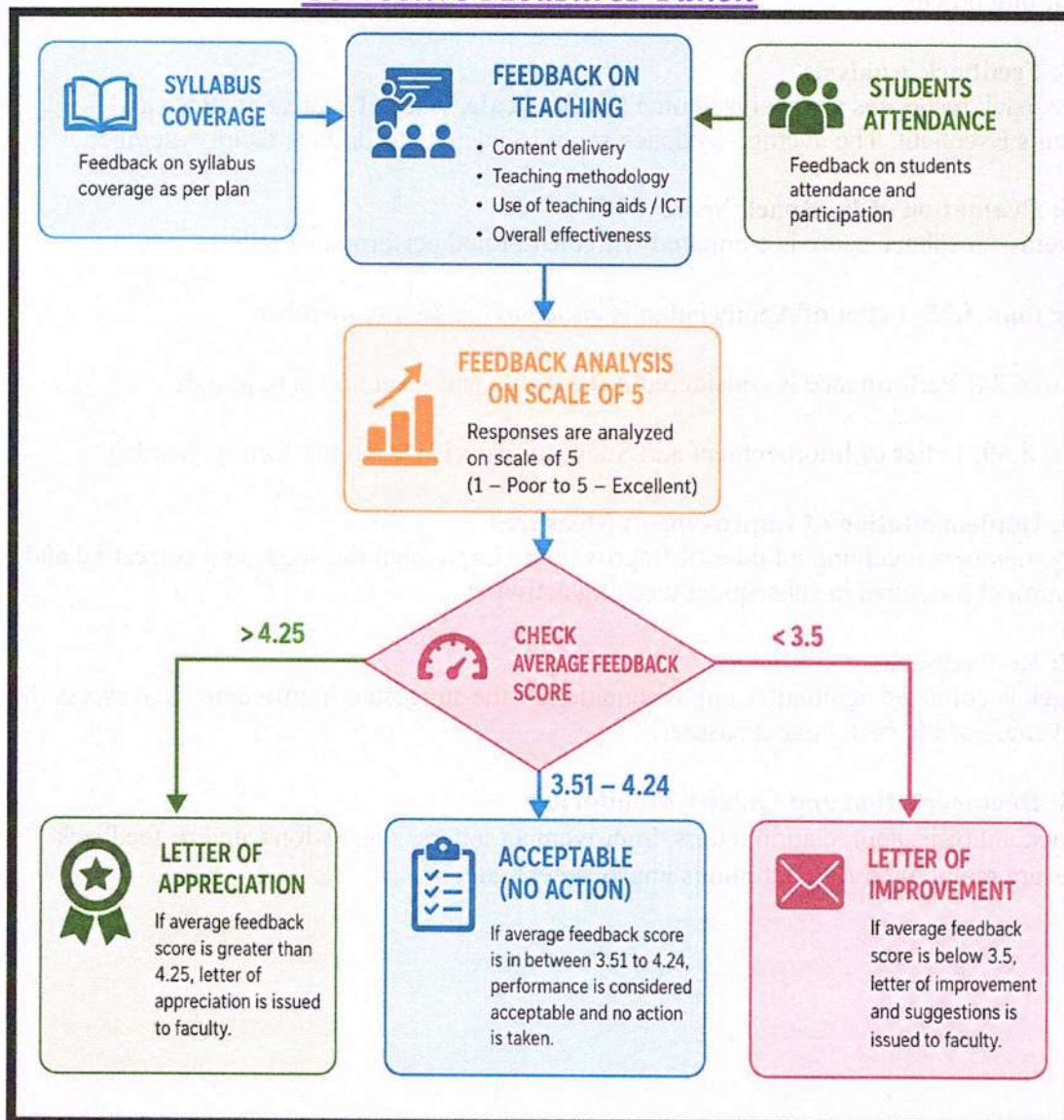


Figure 10: Process of Feedback on Teaching- Learning Process

Process Steps

Step 1: Syllabus Coverage Review

Feedback is collected to verify whether the syllabus is being covered as per the approved teaching plan and academic schedule.

Step 2: Feedback on Teaching

Students provide feedback on content delivery, teaching methodology, use of teaching aids and ICT, and overall effectiveness of teaching.



Step 3: Review of Student Attendance and Participation

Student attendance and participation are reviewed as supporting indicators of the teaching and learning process.

Step 4: Feedback Analysis

The feedback responses are analyzed on a **5-point scale**, where 1 represents Poor and 5 represents Excellent. The average feedback score is calculated for each faculty member.

Step 5: Evaluation of Feedback Score

The average feedback score is compared with the defined performance criteria:

- **More than 4.25:** Letter of Appreciation is issued to the faculty member.
- **3.51 to 4.24:** Performance is considered **Acceptable** and no action is required.
- **Below 3.50:** Letter of Improvement and Suggestions is issued to the faculty member.

Step 6: Implementation of Improvement Measures

Faculty members receiving a Letter of Improvement implement the suggested corrective and improvement measures in subsequent teaching activities.

Step 7: Re-feedback

Feedback is collected again after implementation of the suggested improvements to assess the effectiveness of the corrective measures.

Step 8: Documentation and Quality Monitoring

Feedback analysis, appreciation letters, improvement letters, suggestions, and re-feedback records are maintained for continuous improvement and



11. Processes related to project identification, allotment, continuous monitoring, evaluation including

The **Project Selection, Evaluation and Monitoring Process** provides a systematic framework for identifying, approving, developing, evaluating, and completing student projects in a structured and transparent manner. The process ensures that projects are aligned with faculty expertise, student interests, industry requirements, and societal needs while promoting innovation, research, and problem solving. It incorporates continuous evaluation at different stages of the project lifecycle to monitor progress, provide timely feedback, and ensure the successful achievement of project objectives. Periodic reviews help identify deficiencies at an early stage and facilitate corrective actions, thereby improving the quality of project outcomes.

Steps of the Process

Step 1: Display of Faculty Expertise and Project Domains

- The department displays the research areas, technical expertise, and project domains of faculty members. This helps students identify suitable areas of interest and facilitates the selection of appropriate project guides.

Step 2: Problem Identification and Literature Survey

- Students identify a real world problem or research topic through literature review, industry interaction, societal needs, or emerging technological trends. A preliminary literature survey is conducted to understand the problem and assess its feasibility.

Step 3: Selection of Project Title

- Based on the identified problem and literature survey, students finalize a suitable project title that aligns with the programme objectives and faculty expertise.

Step 4: Project Guide Allocation

- A project guide is allocated according to the project domain, faculty expertise, and availability. The guide provides technical direction and continuously monitors the project's progress.

Step 5: Phase I Review and Evaluation

- Students present the proposed project title, objectives, methodology, scope, and expected outcomes before the Project Review Committee for approval.
- If the committee approves the proposal, the project proceeds to the next stage.
- If modifications are suggested, students revise the title or problem statement and resubmit it for evaluation.

Step 6: Synopsis Preparation and Phase I Presentation



- Students prepare a detailed project synopsis containing the problem statement, objectives, literature review, methodology, work plan, expected outcomes, and project schedule. The synopsis is presented before the review committee for further evaluation.

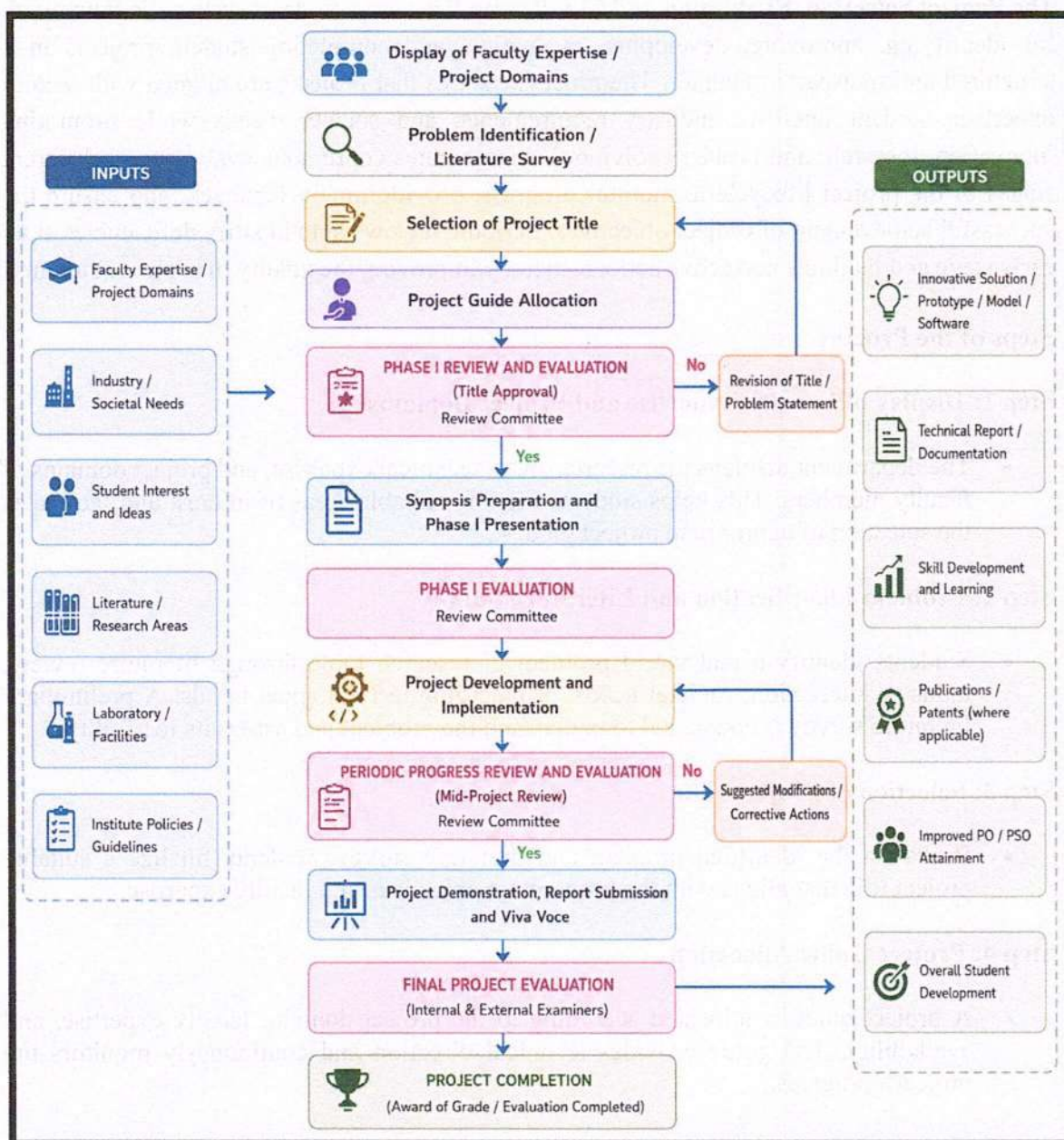


Figure 11: Process of Project Identification, Allotment & Evaluation

Step 7: Phase I Evaluation

- The review committee evaluates the synopsis based on predefined rubrics, including originality, technical feasibility, methodology, and literature survey, innovation, and presentation quality. Feedback is provided for further improvement.

Step 8: Project Development and Implementation



- Students carry out the implementation of the approved project under the continuous guidance of the project supervisor. Depending on the nature of the project, this stage may involve hardware development, software implementation, simulation, experimentation, testing, or prototype development.

Step 9: Periodic Progress Review and Evaluation

- The project progress is reviewed periodically by the review committee. The committee evaluates the work completed, technical progress, documentation, adherence to timelines, and problem solving approach.
- If deficiencies are identified, corrective actions and suitable modifications are suggested before proceeding further.

Step 10: Project Demonstration, Report Submission and Viva Voce

- After successful completion of the project, students demonstrate the working model or software, submit the final project report, and appear for the viva voce examination.

Step 11: Final Project Evaluation

- The completed project is evaluated by internal and external examiners based on predefined evaluation criteria such as technical quality, innovation, implementation, documentation, presentation, demonstration, teamwork, and overall learning outcomes.

Step 12: Project Completion

- Upon successful evaluation, the project is formally completed and graded. Outstanding projects may be recommended for publications, patents, prototype development, product commercialization, or participation in technical competitions.



12. Processes related to Internship/Industrial Training, Allocation, and Execution & Evaluation

The **Internship / Industrial Training Assigning and Evaluation Process** provides a structured framework for identifying internship opportunities, assigning students to suitable organizations, monitoring their progress, and evaluating their performance through a systematic assessment mechanism. The process ensures that students receive practical exposure to industrial practices through **online, offline, or hybrid modes**, depending on organizational requirements and institutional guidelines. It bridges the gap between academic learning and professional practice by enabling students to apply theoretical knowledge in real work environments. Continuous monitoring, documentation, and evaluation ensure the successful achievement of internship objectives while enhancing technical competence, professional ethics, communication skills, and employability.

Steps of the Process

Step 1: Identification of Internship Opportunities

- The department identifies suitable internship and industrial training opportunities through industries, organizations, Memoranda of Understanding (MoUs), alumni, industry interactions, internship portals, and professional networks.
- Internship opportunities may be offered in **online, offline, or hybrid mode** depending on the organization's requirements.

Step 2: Announcement to Students

- Available internship opportunities, eligibility criteria, duration, mode of internship, learning objectives, and application procedures are communicated to students through departmental notices, email, Learning Management System (LMS), or other official communication channels.

Step 3: Assignment of Internship / Industrial Training

- Students are assigned internships based on eligibility, academic performance, area of interest, skill set, faculty recommendations, availability of positions, and organizational requirements.
- Official approval and internship assignment are communicated to both students and the respective organizations.

Step 4: Internship / Industrial Training Execution

- Students undergo internship or industrial training according to the approved schedule in **online, offline, or hybrid mode**.
- During the internship, students perform assigned tasks under the supervision of industry mentors and faculty coordinators while maintaining daily or weekly work logs, progress reports, and regular communication.



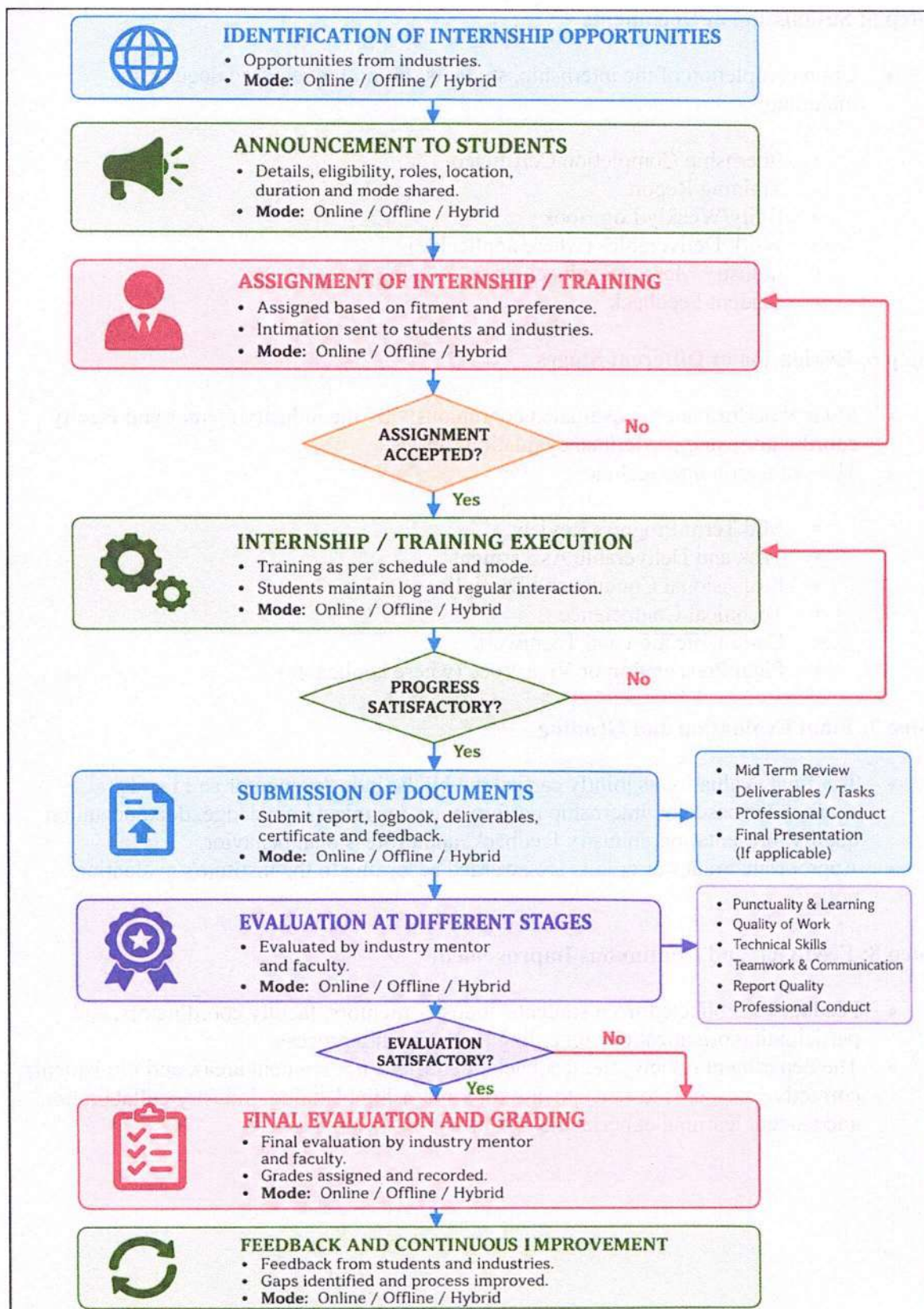


Figure 12: Process of Internship/Industrial Training, Allocation, and Execution & Evaluation



Step 5: Submission of Documents

- Upon completion of the internship, students submit the required documents, including:
 - Internship Completion Certificate
 - Training Report
 - Daily/Weekly Log Book
 - Work Deliverables (where applicable)
 - Industry Mentor Feedback
 - Student Feedback

Step 6: Evaluation at Different Stages

- Student performance is evaluated continuously by the industry mentor and faculty coordinator using predefined evaluation rubrics.
- The evaluation may include:
 - Mid Term Progress Review
 - Task and Deliverable Assessment
 - Professional Conduct and Discipline
 - Technical Competence
 - Communication and Teamwork
 - Final Presentation or Viva Voce (where applicable)

Step 7: Final Evaluation and Grading

- The final evaluation is jointly carried out by the industry mentor and faculty coordinator based on internship performance, technical knowledge, documentation quality, presentation, industry feedback, and professional behavior.
- Appropriate grades or credits are awarded according to the institute's evaluation policy.

Step 8: Feedback and Continuous Improvement

- Feedback is collected from students, industry mentors, faculty coordinators, and participating organizations regarding the internship process.
- The department reviews the feedback, identifies improvement areas, and implements corrective measures to strengthen future internship planning, industry collaboration, and student learning experiences.



13. Processes related to Seminar/Mini Project Allocation, Execution & Evaluation

The **Seminar and Mini/Micro Project Process** provides a systematic framework for planning, approving, executing, monitoring, and evaluating seminars and mini/micro projects. The process encourages students to apply theoretical knowledge to practical problems through literature review, problem identification, design, analysis, implementation, and presentation. It promotes self-learning, research aptitude, innovation, analytical thinking, communication skills, and technical competence. Periodic reviews and decision points ensure that students receive timely feedback and corrective guidance, thereby improving the quality of seminars and project outcomes.

Steps of the Process

Step 1: Planning and Announcement

- The course coordinator announces the seminar and mini/micro project schedule, objectives, guidelines, evaluation criteria, important dates, and submission requirements at the beginning of the semester.

Step 2: Topic / Problem Identification

- Students identify an appropriate seminar topic or mini/micro project problem based on the course objectives, emerging technologies, literature survey, industrial relevance, and feasibility.

Step 3: Approval and Registration

- Students submit the selected topic or problem statement for departmental approval.
- The review committee evaluates the relevance, originality, and feasibility of the proposed topic.
- If the topic is not approved, students revise the topic based on the committee's suggestions and resubmit it for approval.
- Once approved, the topic is officially registered.

Step 4: Planning and Proposal Submission

- Students prepare and submit a project proposal or seminar plan that includes objectives, methodology, work plan, expected outcomes, and implementation strategy.
- The proposal is reviewed for technical correctness and completeness.
- If the proposal requires modification, students revise and resubmit it before proceeding further.

Step 5: Execution

- Students carry out the seminar preparation or project implementation according to the approved plan.



- Activities may include literature review, data collection, software or hardware development, experimentation, simulation, analysis, documentation, or prototype development.

Step 6: Progress Review

- The department periodically reviews the progress of seminars and mini/micro projects to ensure that the work is progressing according to the approved schedule.
- If the progress is found unsatisfactory, students incorporate the suggested improvements and continue the work until satisfactory progress is achieved.

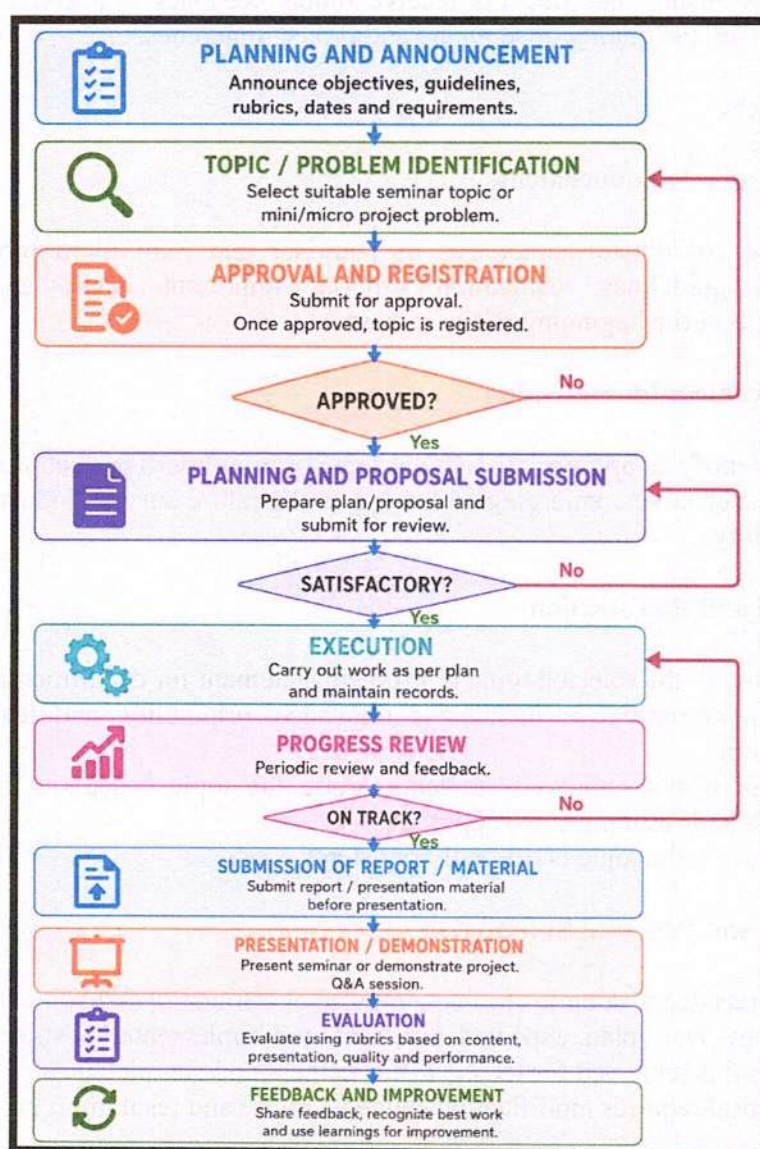


Figure 13: Process of Seminar/Mini Project Allocation, Execution & Evaluation

Step 7: Submission of Report / Presentation Material



- Students submit the seminar report, presentation slides, project report, source code, prototype details, or any other required documents before the final evaluation.

Step 8: Presentation / Demonstration

- Students present their seminar or demonstrate their mini/micro project before the evaluation committee.
- The committee evaluates technical knowledge, presentation skills, implementation, innovation, and the ability to answer questions during the discussion.

Step 9: Evaluation

- The seminar or project is evaluated using predefined rubrics that assess topic relevance, technical quality, methodology, implementation, presentation, documentation, innovation, and overall performance.

Step 10: Feedback and Improvement

- The evaluation committee provides constructive feedback and recommendations to students.
- Best seminars and projects are recognized, and the feedback is used to improve future seminar and project activities.



14. Process of Evaluation of Continuous Assessment: Unit Tests, Mid-Term, Assignments

The **Continuous Assessment Evaluation Process** ensures that student assessment is fair, transparent, reliable, and aligned with the principles of Outcome Based Education (OBE). It establishes constructive alignment between **Course Outcomes (COs)**, assessment methods, and **Program Outcomes (POs)/Program Specific Outcomes (PSOs)** to ensure that every assessment activity measures the intended learning outcomes. Assessment questions and activities are designed using predefined COs, Bloom's Taxonomy levels, and evaluation rubrics to maintain consistency, validity, and quality. The process includes systematic planning, approval, implementation, result analysis, CO attainment measurement, and continuous improvement.

Step 1: CO Finalization and Mapping

- Course Outcomes (COs) are defined for each course and mapped with the relevant Program Outcomes (POs) and Program Specific Outcomes (PSOs) to establish the expected learning outcomes.

Step 2: Assessment Planning

- A Continuous Assessment plan is prepared by defining assessment methods, weightage, schedule, and CO coverage in accordance with the academic calendar and assessment policy.

Step 3: Question Paper / Activity Preparation

- Question papers and assessment activities are designed by ensuring constructive alignment with Course Outcomes, Bloom's Taxonomy levels, and syllabus coverage. Appropriate evaluation rubrics and marking schemes are also prepared.

Step 4: Moderation and Approval

- The prepared question paper or assessment activity is reviewed by the Course Coordinator or HoD to verify CO mapping, syllabus coverage, difficulty level, and overall quality.
- If deficiencies are identified, necessary revisions are made and the assessment is resubmitted for approval.

Step 5: Conduct of Continuous Assessment

- Continuous Assessment is conducted according to the approved academic calendar using appropriate assessment methods such as tests, quizzes, assignments, seminars, presentations, mini projects, and other academic activities.



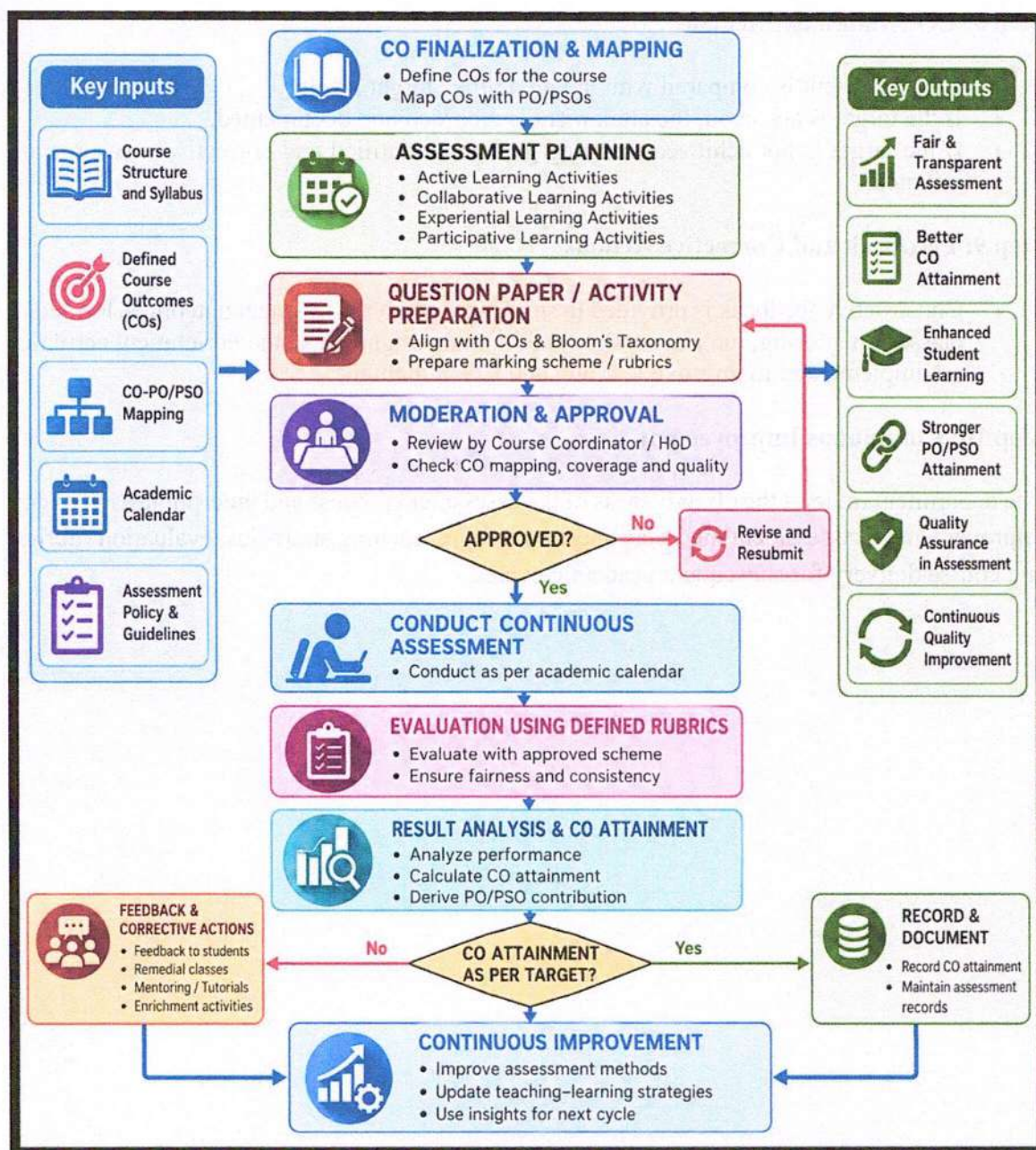


Figure.14 Process Flow of Continuous Assessment

Step 6: Evaluation Using Defined Rubrics

- Student performance is evaluated using predefined answer schemes, rubrics, and marking guidelines to ensure fairness, transparency, and consistency in assessment.

Step 7: Result Analysis and CO Attainment

- Assessment results are analyzed to determine student performance, calculate Course Outcome attainment, and evaluate the contribution towards Program Outcomes and Program Specific Outcomes.



Step 8: CO Attainment Review

- CO attainment is compared with the predefined target levels.
- If the target is achieved, the attainment is recorded and documented.
- If the target is not achieved, learning gaps are identified and corrective measures are initiated.

Step 9: Feedback and Corrective Actions

- Constructive feedback is provided to students based on assessment outcomes. Remedial classes, mentoring, tutorial sessions, additional assignments, and enrichment activities are implemented to improve learning and CO attainment.

Step 10: Continuous Improvement

The department reviews the effectiveness of the assessment process and incorporates necessary improvements in assessment methods, question design, teaching strategies, evaluation rubrics, and course delivery for subsequent academic cycles.



15.Process of Evaluation of Semester End Exam (SEE) Question Paper

The **Continuous Assessment Evaluation Process** ensures that student assessment is fair, transparent, reliable, and aligned with the principles of Outcome Based Education (OBE). It establishes constructive alignment between **Course Outcomes (COs)**, assessment methods, and **Program Outcomes (POs)/Program Specific Outcomes (PSOs)** to ensure that every assessment activity measures the intended learning outcomes. Assessment questions and activities are designed using predefined COs, Bloom's Taxonomy levels, and evaluation rubrics to maintain consistency, validity, and quality. The process includes systematic planning, approval, implementation, result analysis, CO attainment measurement, and continuous improvement.

Step 1: CO Finalization and Mapping

- Course Outcomes (COs) are defined for each course and mapped with the relevant Program Outcomes (POs) and Program Specific Outcomes (PSOs) to establish the expected learning outcomes.

Step 2: Assessment Planning

- A Continuous Assessment plan is prepared by defining assessment methods, weightage, schedule, and CO coverage in accordance with the academic calendar and assessment policy.

Step 3: Question Paper / Activity Preparation

- Question papers and assessment activities are designed by ensuring constructive alignment with Course Outcomes, Bloom's Taxonomy levels, and syllabus coverage. Appropriate evaluation rubrics and marking schemes are also prepared.

Step 4: Moderation and Approval

- The prepared question paper by the Paper Setter is verified by Chairman.
- If deficiencies are identified, necessary revisions are made and the assessment is resubmitted for approval.

Step 5: Conduct of Continuous Assessment

- Continuous Assessment is conducted according to the approved academic calendar using appropriate assessment methods such as tests, quizzes, assignments, seminars, presentations, mini projects, and other academic activities.

Step 6: Evaluation Using Defined Rubrics

- Student performance is evaluated using predefined answer schemes, rubrics, and marking guidelines to ensure fairness, transparency, and consistency in assessment.



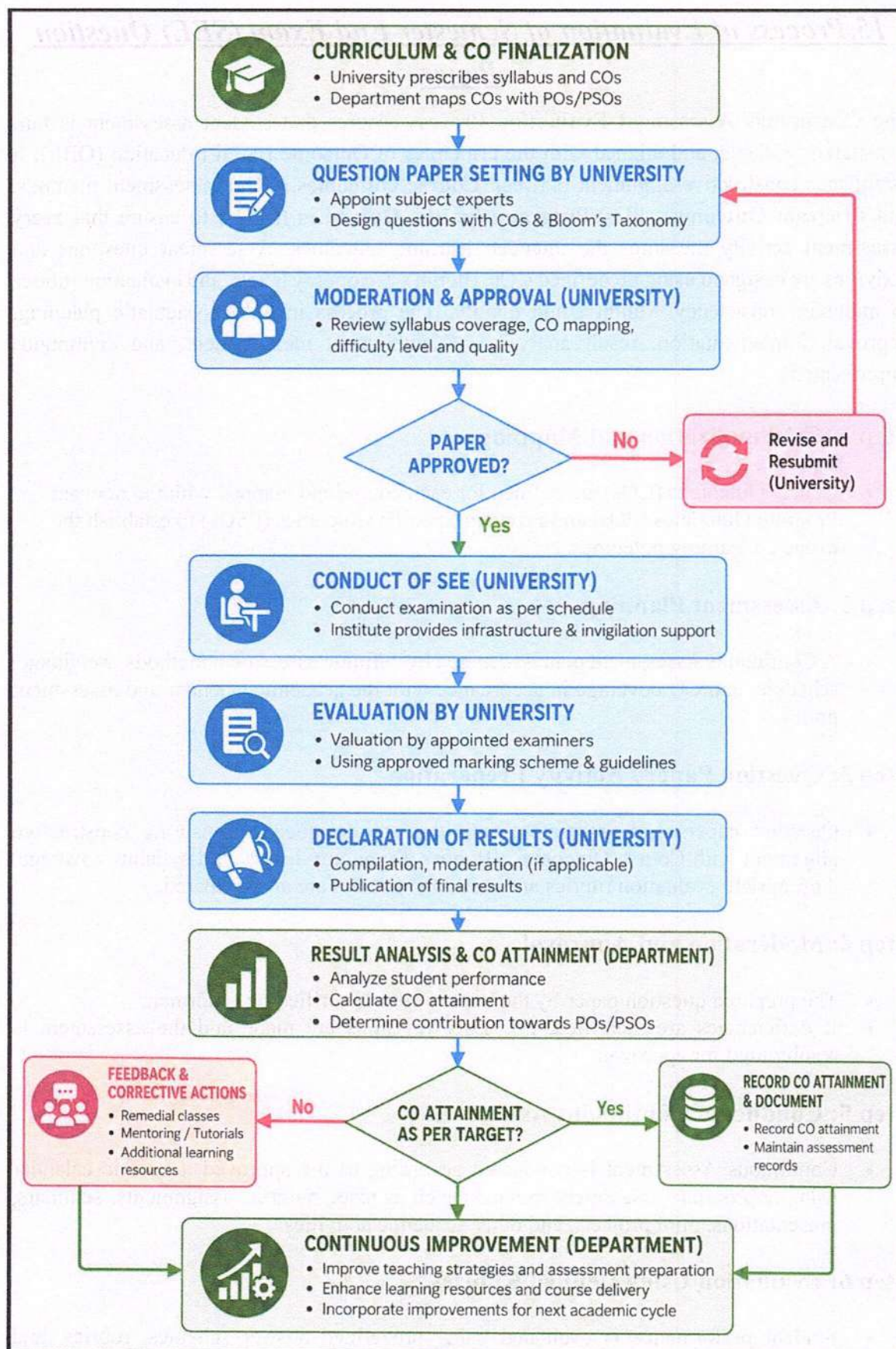


Figure.15 Process Flow of Semester End Examination



Step 7: Result Analysis and CO Attainment

- Assessment results are analyzed to determine student performance, calculate Course Outcome attainment, and evaluate the contribution towards Program Outcomes and Program Specific Outcomes.

Step 8: CO Attainment Review

- CO attainment is compared with the predefined target levels.
- If the target is achieved, the attainment is recorded and documented.
- If the target is not achieved, learning gaps are identified and corrective measures are initiated.

Step 9: Feedback and Corrective Actions

- Constructive feedback is provided to students based on assessment outcomes. Remedial classes, mentoring, tutorial sessions, additional assignments, and enrichment activities are implemented to improve learning and CO attainment.

Step 10: Continuous Improvement

- The department reviews the effectiveness of the assessment process and incorporates necessary improvements in assessment methods, question design, teaching strategies, evaluation rubrics, and course delivery for subsequent academic cycles.



16. Assessment Tools and Processes for the Evaluation of Course Outcome and Program Outcomes

The **Course Outcome (CO) Attainment Process** provides a systematic, objective, and outcome based mechanism for evaluating the extent to which students achieve the intended learning outcomes in both **theory and laboratory courses**. The process integrates **Direct Assessment (80%)** and **Indirect Assessment (20%)** to obtain a comprehensive measure of student performance. Direct assessment evaluates students through Continuous Assessment (CA), Mid Semester Examination (MSE), Internal Laboratory Assessment, and University End Semester Examination (ESE), while indirect assessment captures students' perception of learning through the Course Exit Survey. The combined attainment reflects both academic performance and student feedback, enabling the department to assess the effectiveness of teaching, identify learning gaps, and implement corrective actions for continuous quality improvement.

a) Tools used for the CO's Assessment for Theory Courses

- Continuous Assessment (CA) - Assignments, Unit Test, Poster Presentation, Quiz, Oral
- Mid Semester Exam (MSE)- Written Examination as per University Guidelines
- University Examination(ESE) - Written Examination as per University Guidelines
- Course End Survey

b) Tools used for the CO's Assessment for Laboratory Courses

- Laboratory Evaluation Rubrics
- External Practical/Oral Examination
- Course End Survey

c) Tools used for the CO's Assessment for Project/Seminar/Internship/Industrial Training

- Continuous Internal Review Rubrics

Project/Seminar Report

Table 1: Assessment structure for theory course as per university guidelines

ESE (University Exam)	Marks
CA (Continuous Assessment)	20
MSE (Mid Semester Exam)	20
ESE (End Semester Exam)	60
Total	100



Table 2: Assessment structure for laboratory course as per university guidelines

Assessment Structure	Marks
CA (Continuous Assessment)	60
ESE (University Exam)	40
Total	100

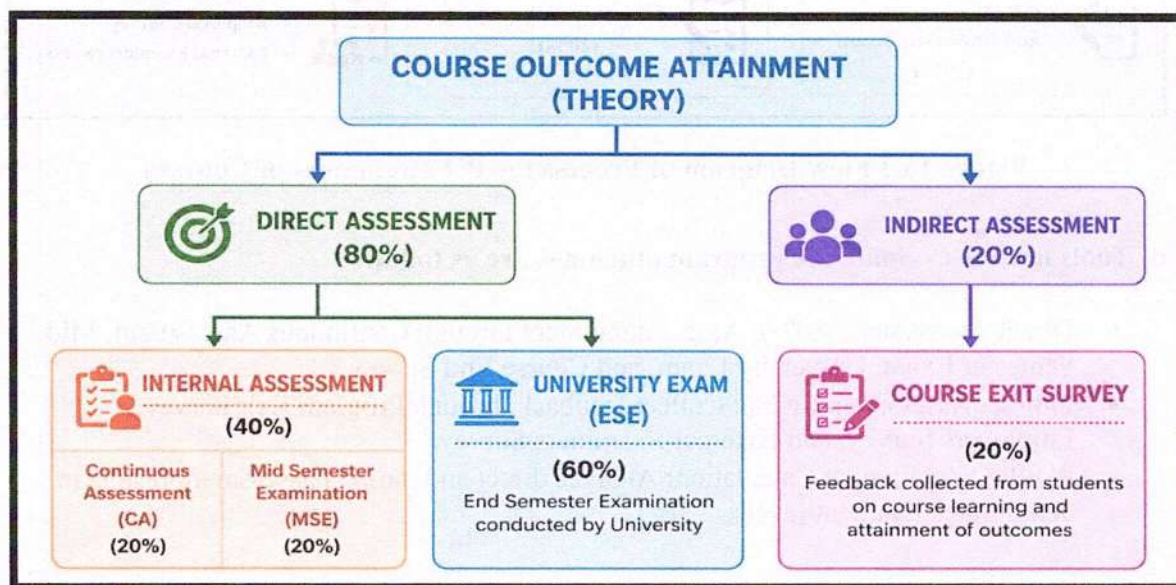


Figure 16.1 Flow Diagram of Process for CO attainment of Theory Courses

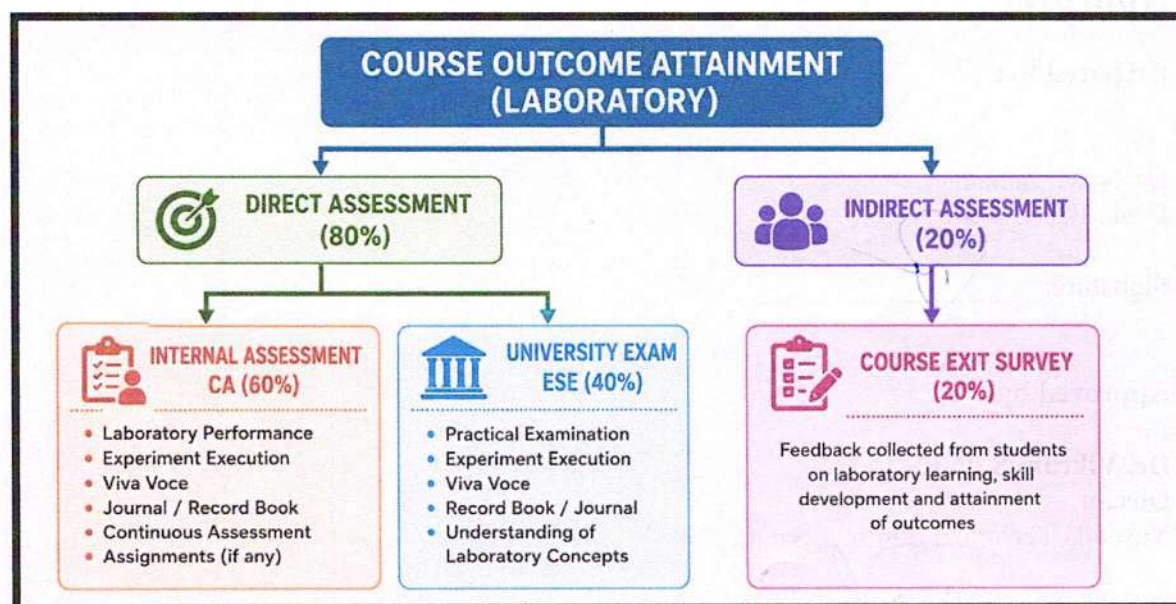


Figure 16.2 Flow Diagram of Process for CO attainment of laboratory Courses



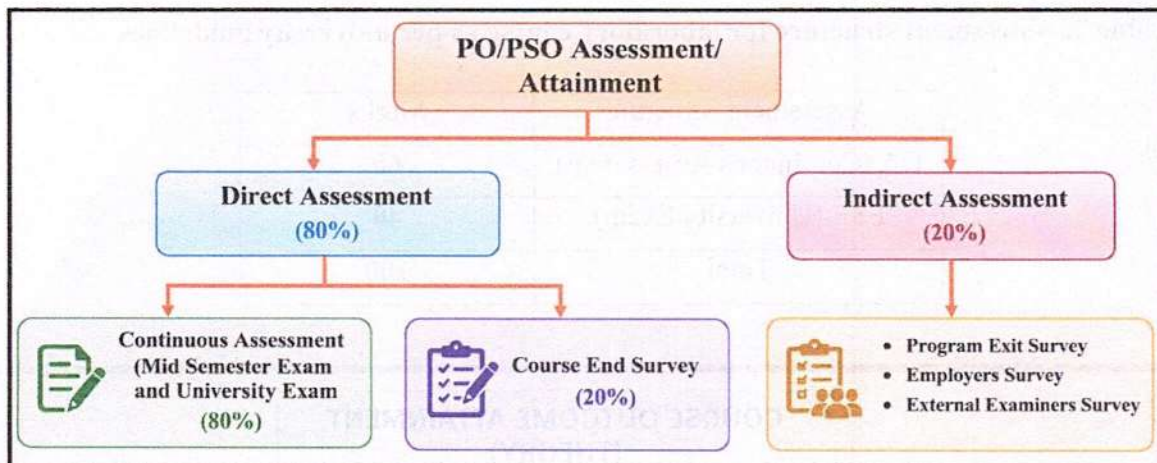


Figure 16.3 Flow Diagram of Process for PO attainment of Courses

d) Tools used to evaluate the program outcomes are as follows

- Direct Assessment (80%): Assess attainment through Continuous Assessment, Mid Semester Exam, University Exam, and Course End Survey.
- Indirect Assessment (20%): Collect feedback through Program Exit Survey, Employers Survey, and External Examiners Survey.
- PO/PSO Attainment Calculation: Analyze direct and indirect assessment results to determine attainment levels.

Approval

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