

R C Patel Institute of Technology

SELF ASSESSMENT REPORT(TIER - I) FOR Mechanical Engineering

Part A : Institutional Information

1 Name and Address of the Institution

R C Patel Institute of Technology,
Near Nimzari Naka, Shahada Road, Shirpur - 425405, Dist: Dhule (MS)

2 Type of the Institution:

<input type="radio"/> Deemed to be University	<input checked="" type="radio"/> Autonomous
<input type="radio"/> University	<input type="radio"/> Non-Autonomous (Affiliated)
<input type="radio"/> Institute of National Importance	<input type="radio"/> Any Other(Please Specify)

3 Year of establishment of the Institution:

2001

4 Ownership Status:

<input type="radio"/> Central Government	<input type="checkbox"/> Any Other(Please Specify)
<input type="radio"/> State Government	
<input type="radio"/> Government Aided	
<input checked="" type="radio"/> Self financing	

5 Name and Address of Affiliating University(if any)

Dr. Babasaheb Ambedkar Technological University, Lonere, Tal-Mangaon,Dist – Raigad, Maharashtra 402103

6 Other Academic Institutions of the Trust/Society/Company etc., if any

Name of Institutions	Year of Establishment	Programs of Study	Location
R.C.Patel Institute of Pharr	1992	Pharmacy	Shirpur
R.C.Patel Institute of Pharr	2003	Pharmacy	Shirpur
H.R.Patel Institute of Pharr	2004	Pharmacy	Shirpur
H.R.Patel Institute of Pharr	2006	Pharmacy	Shirpur
R.C.Patel College of Engine	2016	Engineering	Shirpur
R.C.Patel College of Educa	1990	BEd	Shirpur
SMT H.R.Patel Arts Mahila	1990	Arts	Shirpur

7 Details of all the programs being offered by the Institution under consideration:

Name of Program	Program Applied level	Start of year	Year of AICTE approval	Initial Intake	Intake Increase	Current Intake	Accreditation status	From	To	Program for consideration	Program for Duration
Mechanical Engineering	UG	2004	2021	60	Yes	60	Applying first time	--	--		4

Sanctioned Intake for Last Five Years for the Mechanical Engineering

Academic Year	Sanctioned Intake
2025-26	60
2024-25	60
2023-24	60
2022-23	60
2021-22	60
2020-21	120

8 Programs to be considered for Accreditation vide this application:

S No	Level	Discipline	Program
1	Under Graduate	Engineering & Technology	Computer Engineering
2	Under Graduate	Engineering & Technology	Mechanical Engineering
3	Under Graduate	Engineering & Technology	Electronics and Telecommunication Engineering

Table No. A8.2

S No	Name of the Department	Name of the Program	Name of Allied Departments/Cluster	Name of Allied Program
No record exist(s)				

9 Total Number of Faculty Members in Various Departments:

ID	Department Name	Number of faculty members in the Department (UG and PG)											
		2025-26 (CAY)				2024-25 (CAYm1)				2023-24 (CAYm2)			
		No. of Professors	No. of Associate Professors	No. of Assistant Professors	Total faculty members	No. of Professors	No. of Associate Professors	No. of Assistant Professors	Total faculty members	No. of Professors	No. of Associate Professors	No. of Assistant Professors	Total faculty members
1	Computer Engineering	3	9	16	28	3	1	24	28	4	3	24	31
2	Electronics and Telecommunication	4	4	13	21	4	3	14	21	4	4	15	23
3	Mechanical Engineering	2	3	8	13	1	1	18	20	1	1	18	20
4	Computer Science Engineering (Data Science)	1	3	10	14	1	1	8	10	1	1	9	11
5	Electrical Engineering	1	3	7	11	1	1	10	12	1	0	13	14
6	Civil Engineering	1	3	8	12	1	2	11	14	0	1	13	14
7	Artificial Intelligence and Machine learning	1	3	7	11	1	1	7	9	0	0	6	6
8	Artificial Intelligence and Data Science	0	0	6	6	0	0	0	0	0	0	0	0
9	Information Technology	0	0	4	4	0	0	0	0	0	0	0	0
10	Applied Science and Humanities	2	2	20	24	2	2	20	24	2	2	15	19

10 Total Number of Engineering Students in Various Departments:

ID	Department Name	Number of students in the Department (UG and PG)		
		2025-26 (CAY)	2024-25 (CAYm1)	2023-24 (CAYm2)
1	Computer Engineering	781	785	757
2	Electronics and Telecommunication	498	514	461
3	Mechanical Engineering	229	221	267
4	Computer Science Engineering (Data Science)	387	327	256
5	Electrical Engineering	249	257	222
6	Civil Engineering	222	216	214
7	Artificial Intelligence and Machine learning	258	248	183
8	Artificial Intelligence and Data Science	254	124	0
9	Information Technology	254	125	0

11 Vision of the Institution:

“To become a leading Institute in Technical education fostering innovation, research, ethical values, and sustainable development for the betterment of society.”

12 Mission of the Institution:

To impart high quality Technical Education through:

M1: Innovative and Interactive learning process and high quality globally recognized instructional programs.

M2: Fostering a collaborative scientific temper among students with ethical responsibility towards the society.

M3: Preparing students from diverse backgrounds to have aptitude for employment, entrepreneurship and research with a spirit of Professionalism.

M4: To contribute to Nation’s sustainable development.

13 Contact Information of the Head of the Institution and NBA coordinator, if designated:

Head of the Institution	
Name	Prof. Dr. Jayantrao Bhaurao Pa
Designation	Director
Mobile No.	9923466699
Email ID	director@rcpit.ac.in

NBA Coordinator, If Designated

Name	Dr. Dharmaraj Rajaram Patil
Designation	Head and Professor
Mobile No.	9420404470
Email ID	dharmaraj.patil@rcpit.ac.in

PART B: Criteria Summary

Criteria No.	Criteria	Total Marks	Institute Marks
1	OUTCOME-BASED CURRICULUM	120	120.00
2	OUTCOME-BASED TEACHING LEARNING	120	120.00
3	OUTCOME-BASED ASSESSMENT	120	120.00
4	STUDENTS' PERFORMANCE	120	80.44
5	FACULTY INFORMATION	100	94.89
6	FACULTY CONTRIBUTIONS	120	89.00
7	FACILITIES AND TECHNICAL SUPPORT	100	100.00
8	CONTINUOUS IMPROVEMENT	80	80.00
9	STUDENT SUPPORT AND GOVERNANCE	120	116.00
	Total	1000	920

Part B : Criteria Summary

1 OUTCOME-BASED CURRICULUM (120)

Total Marks 120.00

1.1 Vision, Mission and Program Educational Objectives (PEOs) (35)

Total Marks 35.00

1.1.1 State the Vision and Mission of the Institute and the Department (5)

Institute Marks : 5.00

Vision of the institute	"To become a leading Institute in Technical education fostering innovation, research, ethical values, and sustainable development for the betterment of society."									
Mission of the institute	<p>To impart high quality Technical Education through:</p> <table border="1" data-bbox="220 267 1125 565"> <tr> <td data-bbox="220 267 283 349">M1:</td> <td data-bbox="283 267 1125 349">Innovative and Interactive learning process and high quality globally recognized instructional programs.</td> </tr> <tr> <td data-bbox="220 349 283 430">M2:</td> <td data-bbox="283 349 1125 430">Fostering a collaborative scientific temper among students with ethical responsibility towards the society.</td> </tr> <tr> <td data-bbox="220 430 283 511">M3:</td> <td data-bbox="283 430 1125 511">Preparing students from diverse backgrounds to have aptitude for employment, entrepreneurship and research with a spirit of Professionalism.</td> </tr> <tr> <td data-bbox="220 511 283 565">M4:</td> <td data-bbox="283 511 1125 565">To contribute to Nation's sustainable development.</td> </tr> </table>		M1:	Innovative and Interactive learning process and high quality globally recognized instructional programs.	M2:	Fostering a collaborative scientific temper among students with ethical responsibility towards the society.	M3:	Preparing students from diverse backgrounds to have aptitude for employment, entrepreneurship and research with a spirit of Professionalism.	M4:	To contribute to Nation's sustainable development.
M1:	Innovative and Interactive learning process and high quality globally recognized instructional programs.									
M2:	Fostering a collaborative scientific temper among students with ethical responsibility towards the society.									
M3:	Preparing students from diverse backgrounds to have aptitude for employment, entrepreneurship and research with a spirit of Professionalism.									
M4:	To contribute to Nation's sustainable development.									
Vision of the Department	"To achieve excellence in Mechanical Engineering Education through innovation, research, and strong ethical values for sustainable societal development."									
Mission of the Department	<table border="1" data-bbox="220 906 951 1179"> <thead> <tr> <th data-bbox="220 906 325 976">Mission No.</th> <th data-bbox="325 906 951 976">Mission Statements</th> </tr> </thead> <tbody> <tr> <td data-bbox="220 976 325 1045">M1</td> <td data-bbox="325 976 951 1045">To deliver innovative and practical Mechanical Engineering education through quality instruction and hands-on learning.</td> </tr> <tr> <td data-bbox="220 1045 325 1115">M2</td> <td data-bbox="325 1045 951 1115">To promote teamwork, ethical values, and scientific curiosity through collaborative and socially relevant projects.</td> </tr> <tr> <td data-bbox="220 1115 325 1179">M3</td> <td data-bbox="325 1115 951 1179">To develop competent engineers with technical expertise, research aptitude, and entrepreneurial spirit for sustainable national growth.</td> </tr> </tbody> </table>		Mission No.	Mission Statements	M1	To deliver innovative and practical Mechanical Engineering education through quality instruction and hands-on learning.	M2	To promote teamwork, ethical values, and scientific curiosity through collaborative and socially relevant projects.	M3	To develop competent engineers with technical expertise, research aptitude, and entrepreneurial spirit for sustainable national growth.
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M1	To deliver innovative and practical Mechanical Engineering education through quality instruction and hands-on learning.									
M2	To promote teamwork, ethical values, and scientific curiosity through collaborative and socially relevant projects.									
M3	To develop competent engineers with technical expertise, research aptitude, and entrepreneurial spirit for sustainable national growth.									

1.1.2 State PEOs of the Program (5)

Institute Marks : 5.00

PEO No.	Program Educational Objectives Statements
PEO1	Graduates will apply scientific, mathematical, and engineering principles to solve complex mechanical problems ethically and sustainably.
PEO2	Graduates will design and implement efficient mechanical solutions addressing societal needs through innovation, collaboration, and environmental stewardship.
PEO3	Graduates will demonstrate professional competence, communication, teamwork, and lifelong learning for career growth, entrepreneurship, and higher education.

1.1.3 Process of Defining Vision, Mission and PEOs (10)

Institute Marks : 10.00

The Program Assessment Committee (PAC), chaired by the Head of the Department, is responsible for defining, validating, and reviewing the Vision, Mission, and Program Educational Objectives (PEOs) of the department. The process is systematic, participative, iterative, and cyclic, ensuring alignment with institutional goals and stakeholder expectations. Stakeholder views and feedback are collected periodically by the program coordinator from students, faculty members, alumni, employers, industry professionals, and parents through feedback, meetings, discussions, and interactions. All related records, such as feedback analysis, meeting minutes, draft documents, and approvals, are systematically maintained for transparency and verification. Figure 1.1.3 illustrates the steps involved in defining the vision, mission, and PEOs:

Step 1: Reference to Institute Vision and Mission

The process begins with reference to the Vision and Mission of the Institute, which serve as the guiding framework for developing the department-level Vision, Mission, and PEOs. These ensure consistency with the long-term strategic direction of the institute.

Step 2: Stakeholder Views and Feedback

Stakeholders' views and feedback are collected and analyzed. Inputs focus on:

- Academic expectations
- Industry and employability requirements
- Professional ethics and societal needs
- Emerging technologies and future career paths

These inputs act as a critical foundation for formulation.

Step 3: Preparation of Draft through Department-Level Brainstorming

Based on the institute Vision and Mission and analyzed stakeholder feedback, the department conducts brainstorming sessions involving faculty members. During these sessions:

- Strategic priorities are discussed
- Academic and industry relevance is evaluated
- Alignment with Program Outcomes (POs) is ensured

Following this, a preliminary draft of the Vision, Mission, and PEOs is prepared.

Step 4: Formulation by Program Assessment Committee

The PAC formally formulates the Vision, Mission, and PEOs based on:

- Draft prepared after brainstorming
- Stakeholder feedback
- Academic, industry, and National priorities

The draft emphasizes clarity, discipline relevance, employability, higher education, research orientation, ethical values, innovation, and societal contribution.

Step 5: Validation by Department Advisory Board (DAB)

The formulated Vision, Mission, and PEOs are presented to the Department Advisory Board (DAB) for validation.

- If DAB does not validate the statements, the process loops back to the draft preparation stage, and revisions are carried out based on DAB suggestions.
- If DAB validates the statements, the process proceeds to finalization.

This validation ensures external academic and industry perspectives are incorporated.

Step 6: Finalization by PAC

Upon successful validation by the DAB, the PAC finalizes the Vision, Mission, and PEOs of the department.

Step 7: Revision Requirement Check

The finalized statements are examined to determine whether any further revision is required:

- If revision is required, the process loops back for modification and revalidation.
- If no revision is required, the statements are approved for publication.

Step 8: Publication and Dissemination

Once finalized and approved, the Vision, Mission, and PEOs are published and disseminated to stakeholders through:

- Institute and department webpages
- Display boards
- Faculty-student interactions

- Official communication platforms

Step 9: Periodic and Cyclic Review

The entire process is cyclic in nature. The PAC periodically reviews the Vision, Mission, and PEOs to ensure continued relevance with:

- Technological advancements
- Industry trends
- Academic developments

Any required changes follow the same structured process, ensuring continual, improvement and alignment with stakeholder expectations.

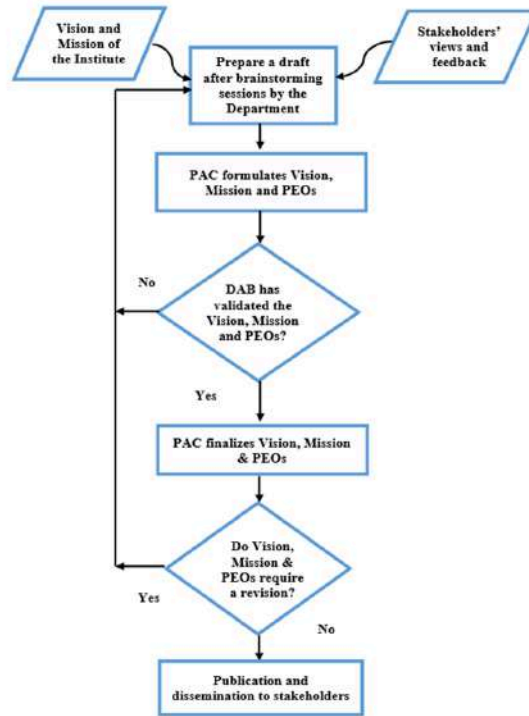


Figure 1.1.3: Process of defining the program Vision, Mission and PEOs

The Vision and Mission of the Institute are published and disseminated among stakeholders as illustrated in Table 1.1.4.1:

Table 1.1.4.1: Publication and dissemination of Vision and Mission of the Institute

Publication of Vision and Mission of the Institute		Stakeholders
Mediums of publication	<ul style="list-style-type: none"> • Institute Website • Social Media Platforms • Institute Newsletter • Institute Magazine • Institute Information Booklet • Training and Placement (T&P) Activity Report 	Internal and External Stakeholders
	<ul style="list-style-type: none"> • Students' Files and Reports • Lab manuals 	Internal Stakeholders
Methods of display	<ul style="list-style-type: none"> • Director's Office • Administrative Office • Auditorium • T&P Office • Canteen and Hostels 	Internal and External Stakeholders
	<ul style="list-style-type: none"> • Central Facilities and Workshop • Classrooms and Laboratories • Notice Boards 	Internal Stakeholders
Methods of dissemination	<ul style="list-style-type: none"> • Induction Program • Alumni Meet • Governing Body Meetings • Academic Council (AC) and Internal Quality Assurance Cell (IQAC) • Letters and Correspondence • Employer Meetings during Placement Drives 	Internal and External Stakeholders

The Vision, Mission and PEOs of the department are published and disseminated among stakeholders as mentioned in Table 1.1.4.2:

Table 1.1.4.2: Publication and dissemination of Vision, Mission and PEOs of the department

Publication of Vision, Mission and PEOs of the Department		Stakeholders
Mediums of publication	<ul style="list-style-type: none"> • Department Webpage • Department Activity Report • Department Newsletter and Magazine 	Internal and External Stakeholders
	<ul style="list-style-type: none"> • Student Files, Reports • Laboratory Manuals • Faculty Diary 	Internal Stakeholders
Methods of display	<ul style="list-style-type: none"> • Head of Department (HoD) Cabin • Faculty Cabin • Prominent Places in the Department 	Internal and External Stakeholders
	<ul style="list-style-type: none"> • Department Library • Notice Boards • Classrooms • Laboratories 	Internal Stakeholders

Publication of Vision, Mission and PEOs of the Department		Stakeholders
Methods of dissemination	<ul style="list-style-type: none"> • Alumni Interaction • PAC Meetings • DAB Meetings • Board of Studies (BoS) Meetings • Letters, and Correspondence • Parent-Teacher Meet 	Internal and External Stakeholders

The Process of Dissemination of the Vision, Mission and PEOs among Stakeholders:

Online Presence:

The Institute and the department maintain a virtual presence through their websites and social media platforms.

Physical Displays in Campus:

The vision, mission, and PEOs are displayed prominently throughout the Campus. Displays can be found in the office, classrooms, laboratories, library, notice boards, corridors, etc.

Internal and External Communication:

The vision, mission, and PEOs are disseminated via different means of communication, such as laboratory manuals, Project and Internship Reports. Parents know about them from institute letters and Institute Website. Alumni, industry professionals, management, training partners and other people who engage with the institute know about the vision, mission, and PEOs through formal interactions.

Meetings:

Every year, newly admitted students and their parents come to know about Vision, Mission and PEOs during an induction program. Formal and informal meetings that take place on a variety of occasions are another effective way to disseminate vision, mission, and PEOs through parents and teachers, Management, Governing Body, DAB, and BoS meetings.

Employers are our external stakeholders, and we communicate Vision, Mission, and PEOs to them through online and in-person meetings. Our employers visit campus in person during the placement drive. Faculty members use email signatures with the department vision and mission when communicating with external stakeholders.

PEO Statements	M1	M2	M3
Graduates will apply scientific, mathematical, and engineering principles to solve complex mechanical problems ethically and sustainably.	3	2	2
Graduates will design and implement efficient mechanical solutions addressing societal needs through innovation, collaboration, and environmental stewardship.	3	3	2
Graduates will demonstrate professional competence, communication, teamwork, and lifelong learning for career growth, entrepreneurship, and higher education.	2	3	3

The justification and rationale behind the mapping of PEOs with the Department Mission statements are presented in Table No. 1.1.5.2, which explains how each PEO supports and contributes toward the fulfillment of the department's mission.

Table No.1.1.5.2: Justification of Mapping of PEOs with Mission.

PEO / Mission	M1: To deliver innovative and practical Mechanical Engineering education through quality instruction and hands-on learning.	M2: To promote teamwork, ethical values, and scientific curiosity through collaborative and socially relevant projects.	M3: To develop competent engineers with technical expertise, research aptitude, and entrepreneurial spirit for sustainable national growth.
<p>PEO 1: Graduates will apply scientific, mathematical, and engineering principles to solve complex mechanical problems ethically and sustainably</p>	<p>3 - High: The mission emphasizes innovative, practice-oriented instruction supported by strong theoretical foundation, laboratory exposure, and hands-on learning. Regular expert sessions on industrial engineering practices, manufacturing, and automotive applications have significantly strengthened students' ability to apply scientific, mathematical, and engineering principles to complex mechanical problems in an ethical and sustainable manner</p>	<p>2- Moderate: The mission promotes ethical values, teamwork, and scientific curiosity through collaborative activities. Expert interactions on industry ethics, social responsibility, and leadership reinforce responsible engineering practices and sustainability awareness, thereby supporting the attainment of PEO1.</p>	<p>2 - Moderate: The mission focuses on developing technical expertise and research aptitude. Activities related to data analytics, automation, programming, and higher studies exposure enhance analytical thinking and investigative ability among students, contributing moderately to the achievement of PEO1.</p>

<p>PEO 2: Graduates will design and implement efficient mechanical solutions addressing societal needs through innovation, collaboration, and environmental stewardship.</p>	<p>3 - High: The mission strongly supports practice-oriented design-based learning through experiential pedagogy. Exposure to product development, industry-academia interactions, and manufacturing practices enables students to develop competence in designing and implementing efficient mechanical systems addressing real-world needs.</p>	<p>3 - High: The mission explicitly promotes teamwork and socially relevant projects. Programs on logistics, renewable energy, employability skills, and industry operations provide students with significant exposure to societal needs, environmental responsibility, and collaborative problem solving, thereby strongly supporting PEO2.</p>	<p>2 - Moderate: The mission encourages research orientation and entrepreneurial mindset. Activities on innovation, entrepreneurship, marketing analytics, and business awareness help students understand optimization and value creation, contributing moderately toward the attainment of PEO2.</p>
<p>PEO 3: Graduates will demonstrate professional competence, communication, teamwork, and lifelong learning for career growth, entrepreneurship, and higher education.</p>	<p>2 - Moderate: The mission ensures quality instructional and experiential learning that build the foundation for professional competence. Training programs on software tools, automation, and engineering services contribute to career readiness and continuous learning ability at a moderate level.</p>	<p>3 - High: The mission gives strong emphasis to teamwork, communication, and ethical conduct. Corporate communication sessions, HR expectation talks, and leadership programs significantly enhance students' professional behavior, interpersonal skills, and workplace readiness, strongly supporting PEO3.</p>	<p>3 - High: The mission directly focuses on career advancement, entrepreneurship, and lifelong learning. Extensive placement guidance, alumni interactions, global career exposure, and career progression programs strongly promote higher education aspirations, professional growth, and adaptability, thereby achieving PEO3 at a high level.</p>

1.2.1 State the Process for Developing/Revising the Program Curriculum (10)

Institute Marks : 10.00

The program curriculum is developed and periodically revised through a systematic, outcome based and participative mechanism involving internal and external stakeholders. The process ensures alignment with PEOs, PSOs and POs, while addressing emerging industry needs, technological advancements, societal expectations, national educational reforms, and academic standards. All related documents - including feedback summaries, minutes of meeting, gap analysis reports, and approval resolutions are maintained for transparency and verification. The overall workflow adopted for curriculum development and revision is illustrated in Figure 1.2.1.1.

A. Committees Involved in Curriculum Development

To ensure academic consistency and industry relevance, curriculum revision follows a multi-level review involving:

Program Assessment Committee:

- Collects stakeholder feedback, analyses data, and identifies curriculum enhancement needs.
- Reviews attainment levels of POs and PSOs to ensure Outcome Based Education (OBE) alignment.

Department Advisory Board:

- Includes senior academicians, employers, alumni, and industry members.
- Reviews PAC recommendations and provides industry-oriented inputs.

Board of Studies:

- Statutory body including external academic and industry experts.
- Evaluates academic depth, credit structure, and regulatory compliance.

Academic Council:

- Academic Council is responsible for final confirmation and authorization for implementation.

B. Step-by-Step Curriculum Revision Process

The development and revision process as outlined below:

Step 1: Feedback Collection & Gap Identification

Structured feedback is collected from Students, Alumni, Employers, Faculty Members, Parents, exit feedback, and academic meetings. Inputs help identify gaps related to industry expectations, technological advancements, employability requirements, skill development, and higher education needs.

Step 2: Analysis by Program Assessment Committee

PAC reviews feedback outcomes along with PO/PSO attainment results. A detailed Gap Analysis and Curriculum Revision Report is prepared by comparing with:

- AICTE Model Curriculum
- Syllabus of premier institutions
- Autonomous colleges/universities

This ensures academic depth, contemporary relevance, and national competitiveness. The identified gaps, missing contents, and corresponding bridging actions proposed in related courses are summarized in Table 1.2.1.1

The curriculum structure is also reviewed for alignment with the National Credit Framework (NCrF) to support academic mobility, multidisciplinary progression, and flexibility in credit distribution.

Step 3: Review by Department Advisory Board

The DAB validates PAC recommendations and suggests additions related to recent technologies, skill requirements, industry tools, professional competencies, and employability. Based on consolidated findings, a Revised Curriculum Proposal is drafted.

Step 4: Approval by Board of Studies

The Revised Curriculum Proposal is presented to the BoS for evaluation. The BoS assesses:

- Academic consistency and learning depth
- Course relevance
- Credit structure and load distribution
- OBE mapping with POs/PSOs
- Alignment with AICTE/University/NCrF norms

Upon approval, the updated syllabus and curriculum structures are finalized.

Step 5: Confirmation by Academic Council

The BoS approved curriculum is forwarded to the Academic Council for final confirmation and implementation authority. Once approved, it becomes operational.

Step 6: Implementation and Monitoring

The revised curriculum is delivered through classroom teaching, laboratory sessions, internships, project-based learning and skill-based activities. PAC periodically evaluates its effectiveness based on attainment results and feedback trends. Further revisions follow the same structured process as depicted in Figure 1.2.1.1.

C. Curriculum Review Frequency

Curriculum review is conducted:

- As per University/BoS/AICTE guidelines, or
- When major technological or industry shifts occur, or
- Based on attainment gaps identified through academic analysis.

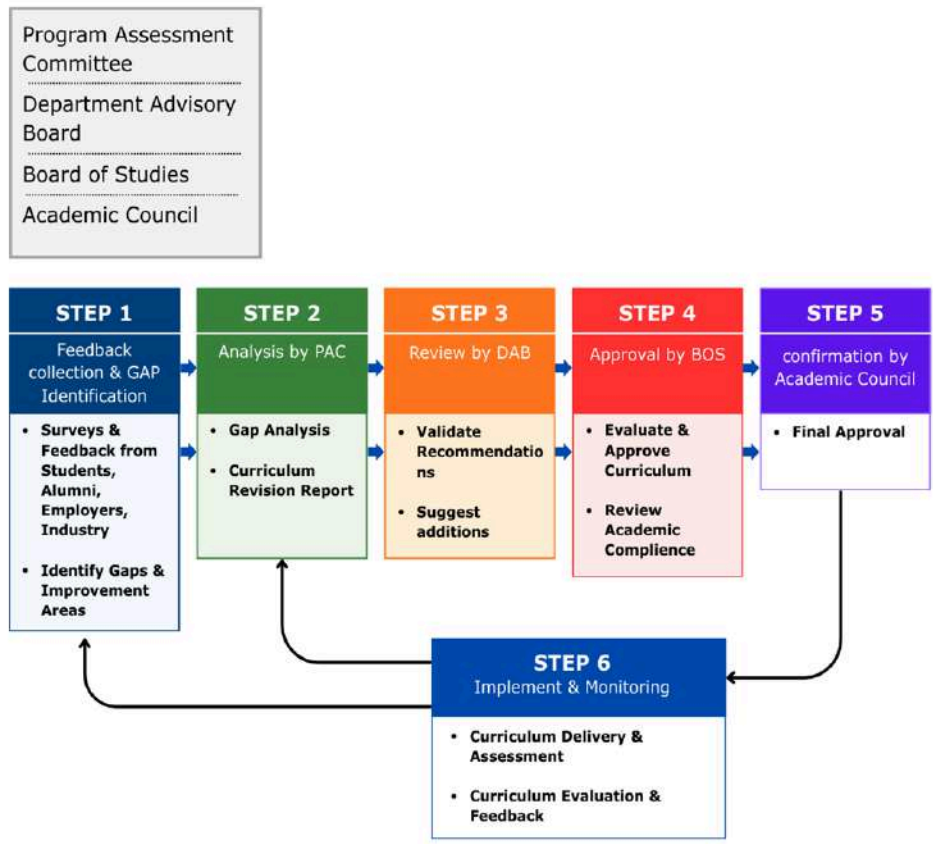


Figure 1.2.1.1: Process for Developing/Revising the Program Curriculum

Table 1.2.1: Identified Gap / Missing Content with related courses and Bridging Action Proposed

S.N.	Stakeholder Feedback Source	Identified Gap / Missing Content	Related Courses	PO / PSO Not Addressed / Weak	Gap Type (Knowledge / Skills / Tools / Attitude)	Bridging Action Proposed	Activity Conducted (Evidence)
1	Student Feedback	Students faced difficulty in applying theoretical for concepts to practical for Automation, IOT and Robotics etc.	Industrial Electronics and Controls, Mechatronics	PO1, PO2, PO5, PSO1	Skill Gap	Industrial Approach in Electrical & Electronics workshop	Workshop Conducted
2	Alumni Interaction	Need IT and AI awareness for higher packages for Mechanical students	Python for Mechanical Engineering	PO1, PO3, PO4, PSO1	Knowledge+ Skills Gap	Alumni Interaction	Alumni Interaction and Expert lecture
3	Exit Survey	Limited team collaboration experience	All project courses	PO9	Attitude/Soft Skill Gap	Interdisciplinary Project Introduction	Implemented in 2024
4	Industry Expert Talk	Absence of structured CAE/CFD fundamentals	Finite Element Analysis and Professional elective	PO2, PO5, PSO1	Knowledge Gap	Added in NEP syllabus	Ansys Training for staff and Applications Syllabus added
5	Employer Feedback	Weak Communication & Presentation skills	Project	PO10	Soft Skills Gap	TA activity Upgraded	Mock Interview+ GD introduced
6	Academic Result Analysis	Students faced difficulty in understanding core concepts of Thermal Engineering	Heat Transfer and Refrigeration and Air conditioning	PO1	Knowledge Gap	Remedial classes conducted to strengthen fundamental concepts	Remedial completed
7	Benchmarking with IITs	Students required enhanced understanding of professional skills, industry exposure, innovation, research orientation, IPR awareness, and entrepreneurial skills	Professional Electives	PO1, PO2, PO8, PO12, PSO1	Knowledge & Exposure Gap	Organized expert lectures, Alumni Interaction, arranged industrial visits, Internship to provide practical exposure	Completed

[Edit](#)

ID	Course Code	Course Title	Classroom Instruction (CI) (in hours per semester)		Lab Instruction (LI) (in hours per semester)	Term Work (TW) and Self Learning (SL) (TW+ SL) (in hours per semester)	Total no. of Hours per semester	Total Credits (C)* (Total Hours/30)
			L	T	P	SL		
1	C101	Engineering Mathematics-I	56	14	0	80	150	5.00
2	C102	Engineering Physics-I	28	0	0	32	60	2.00
3	C103	Engineering Chemistry-I	28	0	0	32	60	2.00
4	C104	Engineering Mechanics	42	14	0	64	120	4.00
5	C105	Basic Electrical Electronics Engineering	42	0	0	48	90	3.00
6	C106	Engineering Science-I Laboratory	0	0	28	2	30	1.00
7	C107	Engineering Mechanics Laboratory	0	0	28	2	30	1.00
8	C108	Basic Electrical Electronics Engineering Laboratory	0	0	28	2	30	1.00
9	C109	Language Proficiency- English	0	0	28	2	30	1.00
10	C110	Engineering Mathematics-II	56	14	0	80	150	5.00
11	C111	Engineering Physics-II	28	0	0	32	60	2.00
12	C112	Engineering Chemistry-II	28	0	0	32	60	2.00
13	C113	Engineering Graphics	28	0	0	32	60	2.00
14	C114	Computer Programming	42	0	0	48	90	3.00
15	C115	Effective Communication Skill	28	0	0	32	60	2.00
16	C116	Engineering Science -II Laboratory	0	0	28	2	30	1.00
17	C117	Engineering Graphics Laboratory	0	0	28	2	30	1.00
18	C118	Computer Programming Laboratory	0	0	28	2	30	1.00
19	C119	Effective Communication Skills Laboratory	0	0	28	2	30	1.00
20	C120	Workshop @	0	0	28	2	30	1.00

21	C201	Engineering Mathematics III	42	14	0	64	120	4.00
22	C202	Engineering Thermodynamics	42	0	0	48	90	3.00
23	C203	Strength of Materials	42	0	0	48	90	3.00
24	C204	Strength of Materials Laboratory	0	0	28	2	30	1.00
25	C205	Manufacturing Processes	42	0	0	48	90	3.00
26	C206	Materials Technology	28	0	0	32	60	2.00
27	C207	Materials Technology Laboratory	0	0	28	2	30	1.00
28	C208	Computer Aided Machine Drawing Laboratory	0	0	56	4	60	2.00
29	C209	Machine Shop Practice I	0	0	56	4	60	2.00
30	C210	Semester Project I	0	0	28	2	30	1.00
31	C211	Engineering Mathematics-IV	42	14	0	64	120	4.00
32	C212	Fluid Mechanics	42	0	0	48	90	3.00
33	C213	Fluid Mechanics Laboratory	0	0	28	2	30	1.00
34	C214	Mechanical Measurements and Metrology	42	0	0	48	90	3.00
35	C215	Mechanical Measurements and Metrology Laboratory	0	0	28	2	30	1.00
36	C216	Advanced Manufacturing Processes	42	0	0	48	90	3.00
37	C217	Kinematics of Machinery	42	0	0	48	90	3.00
38	C218	Kinematics of Machinery Laboratory	0	0	28	2	30	1.00
39	C219	Machine Shop Practice II	0	0	56	4	60	2.00
40	C220	Universal Human Values	28	0	0	32	60	2.00
41	C221	Semester Project II	0	0	28	2	30	1.00
42	C222	Employability Skill Development Program-I	0	0	28	2	30	1.00
43	C301	Automotive Prime Movers	42	0	0	48	90	3.00
44	C302	Automotive Prime Movers Laboratory	0	0	28	2	30	1.00
45	C303	Heat Transfer	42	0	0	48	90	3.00

46	C304	Heat Transfer Laboratory	0	0	28	2	30	1.00
47	C305	Mechanical Vibrations	42	0	0	48	90	3.00
48	C306	Mechanical Vibrations Laboratory	0	0	28	2	30	1.00
49	C307	Industrial Electronics and Controls	42	0	0	48	90	3.00
50	C308	Industrial Electronics and Controls Laboratory	0	0	28	2	30	1.00
51	C309	Renewable Energy Systems* (Professional Elective)	42	0	0	48	90	3.00
52	C310	Python for Mechanical Engineering	0	0	28	2	30	1.00
53	C311	Professional and Business Communication	28	0	0	32	60	2.00
54	C312	Semester Project III	0	0	28	2	30	1.00
55	C313	Employability Skill Development Program – II	0	0	28	2	30	1.00
56	C314	Machine Design I	42	0	0	48	90	3.00
57	C315	Machine Design I Laboratory	0	0	28	2	30	1.00
58	C316	Refrigeration and Air Conditioning	42	0	0	48	90	3.00
59	C317	Refrigeration and Air Conditioning Laboratory	0	0	28	2	30	1.00
60	C318	Mechatronics	42	0	0	48	90	3.00
61	C319	Mechatronics Laboratory	0	0	28	2	30	1.00
62	C320	Power Engineering	42	0	0	48	90	3.00
63	C321	Power Engineering Laboratory	0	0	28	2	30	1.00
64	C322	Smart Materials* (Professional Elective)	42	0	0	48	90	3.00
65	C323	Database Management Systems	0	0	28	2	30	1.00
66	C324	Project Stage I	0	0	28	32	60	2.00
67	C401	Machine Design – II	42	0	0	48	90	3.00
68	C402	Machine Design – II Laboratory	0	0	28	2	30	1.00
69	C403	Finite Element Analysis	42	0	0	48	90	3.00
70	C404	Finite Element Analysis Laboratory	0	0	28	2	30	1.00

71	C405	Automobile Engineering* (Professional Elective Course)	42	0	0	48	90	3.00
72	C406	Research Methodology* (Open Elective Course)	42	0	0	48	90	3.00
73	C407	Project Stage – II	0	0	112	8	120	4.00
74	C408	(PE-I) Industrial Engineering*/Principal of Industrial Engineering (NPTEL)	42	0	0	48	90	3.00
75	C409	(PE-II) Advanced Quantitative Techniques*/Optimization from Fundamentals (NPTEL)	42	0	0	48	90	3.00
76	C410	Internship	0	0	280	20	300	10.00
		Total	1540	70	1456	1974	5040	168.00

1.2.3 Components of Curriculum (5)

Institute Marks : 5.00

Course Components	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total number of credits
Basic Sciences	16.67	840.00	28.00
Basic Engineering	10.12	510.00	17.00
Humanities and Social Scie	5.95	300.00	10.00
Program Core	45.23	2280.00	76.00
Program Electives	8.93	450.00	15.00
Open Electives	1.79	90.00	3.00
Project(s)	5.35	270.00	9.00
Internships/Seminars	5.96	300.00	10.00
Any other (Please specify)	0	28.00	0.00
Total number of Credits			168.00

1.2.4 Strategies for Education Reforms (5)

Institute Marks : 5.00

The Government of Maharashtra, in consonance with the National Education Policy (NEP) 2020, has resolved to implement transformative reforms in higher and technical education to strengthen India's position as a global knowledge hub. Recognizing the urgent need to equip students with multidisciplinary competencies, critical thinking, and industry ready skills, the GR dated 4 July 2023 outlines directives for restructuring undergraduate engineering programmes across autonomous institutions and universities.

The reforms emphasize a four-year multidisciplinary UG framework with multiple entry and exit options, ensuring flexibility, inclusivity, and lifelong learning pathways. By integrating vocational skill enhancement, internships, community engagement, Indian Knowledge Systems, and value education, the curriculum seeks to balance academic consistency with holistic development. The credit framework, aligned with the National Credit Framework and AICTE guidelines, enables horizontal and vertical mobility, fostering innovation, entrepreneurship, and research orientation.

This initiative embeds several strategic reforms, summarized in Figure 1.2.4.1, which collectively support the effective implementation of NEP-2020 aligned education reforms:

- **Curricular restructuring** to promote multidisciplinary learning and employability.
- **Skill integration** through internships, and experiential projects.
- **Flexibility and mobility** via credit transfer, online learning, and open electives.
- **Ethical and societal orientation** through value education, community projects, and co-curricular engagement.
- **Research and innovation focus** with honours and research tracks in the final year.

Through these reforms, institute aims to ensure uniformity, quality, and global competitiveness in engineering education, thereby nurturing graduates who are socially responsible, technologically adept, and prepared for emerging challenges in industry and research.

Maharashtra State Government Resolution Link: <https://www.rcpit.ac.in/files/NEP-2020-GR-Technical-4th-July-2023-030326.pdf> (<https://www.rcpit.ac.in/files/NEP-2020-GR-Technical-4th-July-2023-030326.pdf>)

R. C. Patel Institute of Technology, Shirpur, Maharashtra, is a premier Autonomous Institute committed to excellence in technical education, research, and innovation. Established with the vision of nurturing competent professionals and responsible citizens, the institute has consistently upheld high academic standards and quality assurance practices.

Earlier affiliated with Dr. Babasaheb Ambedkar Technological University (DBATU), Lonere, now R. C. Patel Institute of Technology, Shirpur, has attained autonomous status, enabling it to design and implement a dynamic curriculum aligned with national priorities, industry needs, and global trends. The autonomy empowers the institute to introduce multidisciplinary and interdisciplinary programs, adopt outcome-based education frameworks, and integrate flexible credit systems such as the Academic Bank of Credits (ABC) and Automated Permanent Academic Account Registry (APAAR).

With a strong emphasis on innovation, transparency, and stakeholder engagement, R. C. Patel Institute of Technology, Shirpur, continues to evolve as a center of academic excellence, preparing graduates who are industry-ready, socially responsible, and globally competent.

The institute demonstrates commitment to educational reforms through structured strategies aligned with NEP 2020. The following aspects are emphasized:

Multidisciplinary and Interdisciplinary Curriculum Design

- Integration of open electives across engineering, sciences, humanities, and management.
- Promotion of interdisciplinary projects, hackathons, and research initiatives.
- Mapping of courses to POs and PSOs.

Academic Bank of Credits

- Adoption of ABC framework to allow accumulation, transfer, and redemption of credits.
- Facilitation of credit transfer from MOOCs, NPTEL, SWAYAM, and other recognized platforms.
- Ensures flexibility and lifelong learning opportunities.

Automated Permanent Academic Account Registry

- Registration of students under APAAR for unique academic identity.
- Transparent tracking of credits, achievements, and mobility across institutions.
- Strengthens accountability and recognition of academic progress.

Outcome-Based Mapping of Activities

- All curricular and co-curricular activities mapped to COs, POs, and PSOs.
- Continuous monitoring of attainment levels through direct and indirect assessment tools.
- Evidence-based reporting for accreditation compliance.



Figure 1.2.4.1: Strategies for Education Reforms

Skill Development and Industry Linkages

- Collaboration with industries for internships, projects, and training.
- Organization of interdisciplinary hackathons, innovation challenges, and entrepreneurship programs.
- Focus on employability, innovation, and societal impact.
- Introduction of value-added courses in emerging areas.

Digital and Flexible Learning Initiatives

- Integration of MOOCs, and online platforms.
- Credit transfer from digital courses under ABC.
- Regular feedback from students, alumni, faculty, and industry experts.
- Curriculum reforms aligned with emerging technologies and societal needs.
- Participatory governance ensuring inclusivity and transparency.
- Continuous review through IQAC and Academic Council.

The curriculum design incorporates various educational reforms such as multidisciplinary and interdisciplinary learning approaches, implementation of the ABC, integration of skill-based courses, and recognition of prior learning to enhance flexibility and learner-centric education. The mapped activities reflecting the implementation of these reforms within the curriculum design are presented in Table No. 1.2.4.1.

Table No.1.2.4.1: Mapped activities in curriculum design.

Name of the Course/ Activity	Aligned with NEP Component	Details
Indian Knowledge System	IKS	In 1 st and 2 nd Semester
Health and Wellness-Mind and Body Management	Liberal Learning	In 1 st Semester
Python for Mechanical Engineering Laboratory	Multidisciplinary	In 3 rd Semester
Community Engagement Service	Experiential Learning	In 3 rd Semester
Economics and Financial Management	Humanities Social Science and Management	In 3 rd Semester
Data Structures and algorithm Laboratory	Multidisciplinary	In 4 th Semester

Name of the Course/ Activity	Aligned with NEP Component	Details
Semester Project-I, II, III	Skill Enhancement Course	In 3 rd Semester to 5 th Semester
Major Project Stage 1 & 2	Skill Enhancement Course	In 6 th & 7 th Semester
Internship	Internship	In 8 th Semester

1.3 PO, PSO and their Mapping with Courses (20)

Total Marks 20.00

1.3.1 POs and PSOs (5)

:

PSO1	Students will be able to apply Mechanical Engineering principles and modern tools to design and improve mechanical systems with innovative solutions.
PSO2	Students will demonstrate ethical practice, teamwork, and communication to develop engineering solutions for societal and sustainable development.

1.3.2 Mapping between the Courses and POs/PSOs (15)

Institute Marks : 15.00

PO:

PO Number	List of Courses
PO1	C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C118, C120, C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C217, C218, C219, C221, C222, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C312, C313, C314, C315, C316, C317, C318, C319, C320, C321, C322, C323, C324, C401, C402, C403, C404, C405, C406, C407, C408, C409, C410
PO2	C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C217, C218, C219, C221, C222, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C311, C312, C313, C314, C315, C316, C317, C318, C319, C320, C321, C322, C323, C324, C401, C402, C403, C404, C405, C406, C407, C408, C409, C410
PO3	C102, C103, C104, C105, C106, C107, C108, C109, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C202, C203, C204, C205, C206, C207, C208, C209, C210, C212, C213, C214, C215, C216, C217, C218, C219, C221, C222, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C311, C312, C313, C314, C315, C316, C317, C318, C319, C320, C321, C322, C323, C324, C401, C402, C403, C404, C405, C406, C407, C408, C409
PO4	C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C115, C116, C117, C119, C120, C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C217, C218, C219, C221, C222, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C311, C312, C313, C314, C315, C316, C317, C318, C319, C320, C321, C324, C401, C402, C403, C404, C405, C406, C407, C408, C409, C410
PO5	C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C113, C114, C115, C117, C118, C119, C120, C203, C204, C205, C208, C209, C210, C214, C215, C216, C217, C218, C219, C221, C222, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C312, C313, C314, C315, C316, C317, C318, C319, C323, C324, C401, C402, C403, C404, C405, C406, C407, C408
PO6	C103, C105, C106, C108, C112, C116, C202, C203, C204, C206, C207, C209, C210, C216, C220, C221, C301, C302, C303, C304, C305, C306, C309, C314, C315, C316, C317, C318, C319, C320, C321, C324, C401, C402, C405, C407, C408, C102, C113, C117, C120, C205, C208, C212, C213, C322, C410
PO7	C103, C105, C106, C108, C113, C117, C203, C204, C209, C210, C217, C218, C219, C220, C221, C301, C302, C303, C304, C305, C306, C307, C308, C311, C316, C317, C320, C321, C324, C401, C402, C403, C404, C405, C406, C407, C408, C410
PO8	C102, C104, C105, C107, C108, C109, C113, C115, C117, C119, C120, C202, C205, C206, C207, C208, C209, C210, C214, C215, C217, C218, C219, C220, C221, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C311, C312, C316, C317, C318, C319, C320, C321, C322, C324, C401, C402, C403, C404, C405, C407, C408, C410
PO9	C102, C103, C104, C105, C106, C107, C108, C109, C111, C112, C113, C115, C116, C117, C119, C120, C202, C203, C204, C205, C206, C207, C208, C209, C210, C214, C215, C216, C217, C218, C219, C220, C221, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C311, C312, C313, C314, C315, C316, C317, C318, C319, C320, C321, C322, C323, C324, C401, C402, C403, C404, C405, C406, C407, C408, C410
PO10	C103, C106, C111, C113, C115, C117, C119, C120, C209, C210, C220, C221, C301, C302, C303, C304, C312, C316, C317, C318, C319, C324, C401, C402, C407, C408, C409
PO11	C101, C103, C104, C105, C106, C107, C108, C109, C110, C111, C113, C114, C115, C117, C118, C119, C120, C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, C211, C214, C215, C216, C217, C218, C219, C220, C221, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C312, C316, C317, C318, C319, C320, C321, C323, C324, C401, C402, C403, C404, C405, C406, C407, C408, C409, C410

PSO:

PO Number	List of Courses
PSO1	C101, C102, C104, C107, C109, C113, C115, C117, C119, C120, C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C217, C218, C219, C220, C221, C222, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C312, C313, C314, C315, C316, C317, C318, C319, C320, C321, C322, C323, C324, C401, C402, C403, C404, C405, C406, C407, C408, C409, C410
PSO2	C102, C103, C104, C105, C106, C107, C108, C109, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C202, C203, C204, C205, C206, C207, C208, C209, C210, C212, C213, C214, C215, C216, C217, C218, C219, C220, C221, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C311, C312, C314, C315, C316, C317, C318, C319, C320, C321, C322, C323, C324, C401, C402, C403, C404, C405, C406, C407, C408, C409, C410

1.4 Course Outcomes and Course Articulation Matrix (30)

Total Marks 30.00

No. of Core Courses : 6	C2 : 2	C3 : 2	C4 : 2
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Note : Number of Outcomes for a Course is expected to be around 6.

Course Code :	C202	Semester :	3
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Course Outcome	Statements
C202.1	Demonstrate application of the first law of thermodynamics to a wide range of systems.
C202.2	Analyze and apply the steady flow energy equation to evaluate energy interactions in various flow and non-flow thermodynamic systems
C202.3	Compute heat and work interactions in thermodynamic systems.
C202.4	Demonstrate the interrelations between thermodynamic functions to solve practical problems.
C202.5	Use steam table and Mollier chart to compute thermodynamics interactions.
C202.6	Compute efficiencies of heat engines, power cycles etc..

Course Code :	C214	Semester :	4
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Course Outcome	Statements
C214.1	Classify various types of static characteristics and types of errors occurring in the system.
C214.2	Classify and select proper measuring instrument for displacement, strain, pressure and temperature measurement.
C214.3	Select proper measuring instrument for linear and angular measurement.
C214.4	Demonstrate inspection methods and design of different limit gauges.
C214.5	Demonstrate characteristics of surface texture, screw threads, and gear measurements.

Course Code :	C303	Semester :	5
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Course Outcome	Statements
C303.1	Explain the mechanism of heat transfer by conduction and analyze various types of one-dimensional heat conduction problems.
C303.2	Explain the mechanism of heat transfer by convection and analyze free and forced convection problems.
C303.3	Determine the rate of heat transfer by radiation and analyze the effect of radiation shield in radiation exchange between two surfaces.
C303.4	Explain different types of heat exchangers and analyze heat exchanger using LMTD and NTU method.

Course Code :	C316	Semester :	6
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Course Outcome	Statements
C316.1	Predict the fundamentals of thermodynamics to refrigeration systems and calculate the coefficient of performance of reversed Carnot cycle, Bell-Coleman cycle and Aircraft refrigeration systems.
C316.2	Categorize the vapour compression refrigeration systems, components and interpret the importance of refrigerant properties and its selection criteria.
C316.3	Analyze the psychrometric properties, processes, charts and principles of air-conditioning.

C316.4	Build air-conditioning systems using cooling load calculations and duct design principles.
C316.5	Discuss the applications and controls of various refrigeration and air-conditioning systems.

Course Code :	C401	Semester :	7
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Course Outcome	Statements
C401.1	Select appropriate gears for power transmission on the basis of given power and speed.
C401.2	Design gears based on the given conditions.
C401.3	Select bearings for a given application from the manufacturers catalogue.
C401.4	Design the flywheel for given applications.
C401.5	Design cam and follower mechanisms.
C401.6	Design clutches and brakes.

Course Code :	C408	Semester :	8
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Course Outcome	Statements
C408.1	Illustrate the need for optimization of resources and its significance
C408.2	Develop ability in integrating knowledge of design along with other aspects of value addition in the conceptualization and manufacturing stage of various products
C408.3	Demonstrate the concept of value analysis and its relevance.
C408.4	Evaluate and implement different concepts involved in method study and understanding of work content in different situations.
C408.5	Describe different aspects of work system design and facilities design pertinent to manufacturing industries.
C408.6	Illustrate concepts of Agile manufacturing, Lean manufacturing and Flexible manufacturing.

1.4.2 Course Articulation Matrix (15)

:

1 . course name : C2C202

Course	Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C2C202.1	Demonstral	3 ▾	1 ▾	- ▾	- ▾	- ▾	3 ▾	- ▾	3 ▾	3 ▾	- ▾	3 ▾
C2C202.2	Analyze an	3 ▾	2 ▾	1 ▾	3 ▾	- ▾	- ▾	- ▾	1 ▾	- ▾	- ▾	2 ▾
C2C202.3	Compute hi	3 ▾	2 ▾	1 ▾	3 ▾	- ▾	3 ▾	- ▾	1 ▾	- ▾	- ▾	2 ▾
C2C202.4	Demonstral	3 ▾	1 ▾	- ▾	- ▾	- ▾	3 ▾	- ▾	1 ▾	- ▾	- ▾	2 ▾
C2C202.5	Use steam	3 ▾	2 ▾	- ▾	3 ▾	- ▾	- ▾	- ▾	1 ▾	- ▾	- ▾	2 ▾
C2C202.6	Compute el	3 ▾	2 ▾	- ▾	3 ▾	- ▾	- ▾	- ▾	- ▾	- ▾	- ▾	2 ▾
Average		3.00	1.67	1.00	3.00	0.00	3.00	0.00	1.40	3.00	0.00	2.17

2 . course name : C2C214

Course	Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C2C214.1	Classify var	2 ▾	2 ▾	1 ▾	- ▾	- ▾	- ▾	- ▾	1 ▾	- ▾	- ▾	1 ▾
C2C214.2	Classify an	3 ▾	2 ▾	1 ▾	- ▾	1 ▾	- ▾	- ▾	- ▾	- ▾	- ▾	1 ▾
C2C214.3	Select prop	3 ▾	2 ▾	1 ▾	1 ▾	1 ▾	- ▾	- ▾	1 ▾	1 ▾	- ▾	1 ▾
C2C214.4	Demonstral	3 ▾	3 ▾	1 ▾	1 ▾	1 ▾	- ▾	- ▾	1 ▾	1 ▾	- ▾	1 ▾
C2C214.5	Demonstral	3 ▾	2 ▾	1 ▾	1 ▾	1 ▾	- ▾	- ▾	1 ▾	1 ▾	- ▾	1 ▾
Average		2.80	1.00	1.00	1.00	1.00	2.00	0.00	1.00	1.00	0.00	1.00

3 . course name : C3C303

Course	Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C3C303.1	Explain the	3 ▾	3 ▾	1 ▾	1 ▾	1 ▾	- ▾	2 ▾	2 ▾	2 ▾	- ▾	1 ▾
C3C303.2	Explain the	3 ▾	3 ▾	1 ▾	1 ▾	1 ▾	- ▾	2 ▾	2 ▾	2 ▾	- ▾	1 ▾
C3C303.3	Determine l	3 ▾	3 ▾	1 ▾	1 ▾	1 ▾	3 ▾	2 ▾	2 ▾	2 ▾	1 ▾	1 ▾
C3C303.4	Explain diff	3 ▾	3 ▾	1 ▾	1 ▾	1 ▾	3 ▾	2 ▾	2 ▾	2 ▾	1 ▾	1 ▾
Average		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4 . course name : C3C316

Course	Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C3C316.1	Predict the	3 ▾	3 ▾	- ▾	1 ▾	1 ▾	- ▾	- ▾	- ▾	1 ▾	- ▾	- ▾
C3C316.2	Categorize	3 ▾	1 ▾	1 ▾	1 ▾	- ▾	2 ▾	3 ▾	- ▾	1 ▾	1 ▾	1 ▾
C3C316.3	Analyze the	3 ▾	3 ▾	1 ▾	1 ▾	2 ▾	3 ▾	3 ▾	- ▾	3 ▾	1 ▾	1 ▾

C3C316.4	Build air-co	3 ▾	3 ▾	2 ▾	2 ▾	2 ▾	3 ▾	3 ▾	3 ▾	3 ▾	2 ▾	2 ▾
C3C316.5	Discuss the	3 ▾	1 ▾	1 ▾	1 ▾	2 ▾	3 ▾	3 ▾	3 ▾	3 ▾	2 ▾	2 ▾
Average		3.00	2.20	1.25	1.20	1.75	2.38	3.00	3.00	2.20	1.50	1.50

5 . course name : C4C401

Course	Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C4C401.1	Select appr	2 ▾	1 ▾	- ▾	- ▾	- ▾	- ▾	- ▾	- ▾	- ▾	- ▾	- ▾
C4C401.2	Design gea	3 ▾	3 ▾	3 ▾	1 ▾	1 ▾	2 ▾	1 ▾	1 ▾	1 ▾	1 ▾	1 ▾
C4C401.3	Select bear	2 ▾	1 ▾	- ▾	- ▾	- ▾	2 ▾	1 ▾	- ▾	- ▾	- ▾	- ▾
C4C401.4	Design the	3 ▾	3 ▾	3 ▾	3 ▾	3 ▾	2 ▾	1 ▾	1 ▾	1 ▾	1 ▾	1 ▾
C4C401.5	Design can	3 ▾	3 ▾	3 ▾	3 ▾	3 ▾	2 ▾	1 ▾	1 ▾	1 ▾	1 ▾	1 ▾
C4C401.6	Design clut	3 ▾	3 ▾	3 ▾	3 ▾	3 ▾	2 ▾	1 ▾	1 ▾	1 ▾	1 ▾	1 ▾
Average		2.67	2.33	3.00	2.50	2.50	2.00	1.00	1.00	1.00	1.00	1.00

6 . course name : C4C408

Course	Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C4C408.1	Illustrate th	3 ▾	1 ▾	1 ▾	1 ▾	1 ▾	- ▾	- ▾	- ▾	- ▾	1 ▾	1 ▾
C4C408.2	Develop ab	2 ▾	1 ▾	3 ▾	1 ▾	2 ▾	1 ▾	1 ▾	- ▾	1 ▾	1 ▾	1 ▾
C4C408.3	Demonstral	2 ▾	1 ▾	2 ▾	1 ▾	1 ▾	2 ▾	1 ▾	1 ▾	1 ▾	1 ▾	2 ▾
C4C408.4	Evaluate ar	3 ▾	1 ▾	2 ▾	1 ▾	2 ▾	2 ▾	- ▾	1 ▾	1 ▾	- ▾	3 ▾
C4C408.5	Describe di	3 ▾	1 ▾	3 ▾	1 ▾	2 ▾	2 ▾	1 ▾	1 ▾	1 ▾	- ▾	2 ▾
C4C408.6	Illustrate co	2 ▾	2 ▾	2 ▾	1 ▾	3 ▾	2 ▾	1 ▾	1 ▾	1 ▾	- ▾	3 ▾
Average		2.50	1.17	2.17	1.00	1.83	1.75	1.00	1.00	1.00	1.00	2.00

1 . Course Name : C2C202

Course	PSO1	PSO2
C2C202.1	1 ▾	3 ▾
C2C202.2	1 ▾	- ▾
C2C202.3	1 ▾	3 ▾
C2C202.4	1 ▾	- ▾
C2C202.5	1 ▾	- ▾
C2C202.6	1 ▾	- ▾
Average	0.00	0.00

2 . Course Name : C2C214

Course	PSO1	PSO2
C2C214.1	1 ▾	1 ▾
C2C214.2	1 ▾	1 ▾
C2C214.3	1 ▾	1 ▾
C2C214.4	1 ▾	1 ▾
C2C214.5	1 ▾	1 ▾
Average	0.00	0.00

3 . Course Name : C3C303

Course	PSO1	PSO2
C3C303.1	1 ▾	1 ▾
C3C303.2	1 ▾	1 ▾
C3C303.3	3 ▾	3 ▾
C3C303.4	3 ▾	3 ▾
Average	0.00	0.00

4 . Course Name : C3C316

Course	PSO1	PSO2
C3C316.1	1 ▾	- ▾
C3C316.2	1 ▾	1 ▾
C3C316.3	2 ▾	2 ▾

C3C316.4	2	▼	3	▼
C3C316.5	1	▼	3	▼
Average	0.00		0.00	

5 . Course Name : C4C401

Course	PSO1		PSO2	
C4C401.1	1	▼	-	▼
C4C401.2	3	▼	1	▼
C4C401.3	1	▼	-	▼
C4C401.4	3	▼	1	▼
C4C401.5	3	▼	1	▼
C4C401.6	3	▼	1	▼
Average	0.00		0.00	

6 . Course Name : C4C408

Course	PSO1		PSO2	
C4C408.1	2	▼	2	▼
C4C408.2	2	▼	2	▼
C4C408.3	1	▼	2	▼
C4C408.4	2	▼	2	▼
C4C408.5	2	▼	1	▼
C4C408.6	1	▼	2	▼
Average	1.67		1.83	

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C101	3	2	PO3	1.20	1	PO6	PO7	PO8	PO9	PO10	1
C102	2	1	1	1	1	1.5	PO7	1	1.25	PO10	PO11
C103	1.75	2.25	1	1	1	2.25	2	PO8	1	1	3
C104	3	2	1	1.50	1	PO6	PO7	1	1	PO10	1
C105	2	2.60	1	1.60	3	2	2	1	1	PO10	3
C106	1.75	2.25	1	1	1	2.25	2	PO8	1	1	3
C107	3	2	1	1.50	1	PO6	PO7	1	1	PO10	1
C108	2	2.60	1	1.60	3	2	2	1	1	PO10	3
C109	1	1	1	1	1	PO6	PO7	1.50	1.40	PO10	1
C110	3	2	PO3	1.20	1	PO6	PO7	PO8	PO9	PO10	1
C111	2.25	1	1	1	1	PO6	PO7	PO8	1.75	1	1
C112	1.75	1.25	1	1	PO5	2	PO7	PO8	2	PO10	PO11
C113	2	1.40	1.40	1.50	1.50	1	1	1	1.80	1	2
C114	1	1	2	PO4	1	PO6	PO7	PO8	PO9	PO10	1
C115	1	1	1	1	1	PO6	PO7	1	1	1	1
C116	1.75	1.25	1	1	PO5	2	PO7	PO8	2	PO10	PO11
C117	2	1.40	1.40	1.50	1.50	1	1	1	1.80	1	2
C118	1	1	2	PO4	1	PO6	PO7	PO8	PO9	PO10	1
C119	PO1	1	1	1	1	PO6	PO7	1	1	1	1
C120	3	3	2	1.80	1	1	PO7	1	1	1	2
C201	3	2	PO3	2	PO5	PO6	PO7	PO8	PO9	PO10	1
C202	3	1.67	1	3	PO5	3	PO7	1.40	3	PO10	2.17
C203	2.67	1.67	1	1	1	1.5	1	PO8	1	PO10	1
C204	2.67	1.67	1	1	1	1.5	1	PO8	1	PO10	1
C205	3	1.40	1	1	1	2	PO7	1	1	PO10	1
C206	2.40	1	1	1	PO5	1.5	PO7	1	1	PO10	1
C207	2.40	1	1	1	PO5	1.5	PO7	1	1	PO10	1
C208	1.67	1	1	1	2	1	PO7	1	1	PO10	1
C209	2	2	2	1	1	2.5	3	3	1	1	2
C210	2.50	2	1	2	1	2	3	2	1.67	1	2
C211	3	2.80	PO3	2.20	PO5	PO6	PO7	PO8	PO9	PO10	1
C212	2.33	2	1	1	PO5	3	PO7	PO8	PO9	PO10	PO11

C213	2.33	2	1	1	PO5	3	PO7	PO8	PO9	PO10	PO11
C214	2.80	2.20	1	1	1	PO6	PO7	1	1	PO10	1
C215	2.80	2.20	1	1	1	PO6	PO7	1	1	PO10	1
C216	2.80	2.40	1.25	1.50	1.25	2.34	PO7	PO8	1	PO10	1.80
C217	3	2.20	1	1	1	PO6	1	1	1	PO10	1
C218	3	2.20	1	1	1	PO6	1	1	1	PO10	1
C219	3	1.33	3	2	1.67	PO6	2	3	2.33	PO10	1.33
C220	PO1	PO2	PO3	PO4	PO5	2.6	3	2	1	1	1.20
C221	2.50	2	1	2	1	2	3	2	1.67	1	2
C222	1.50	1	1	1	1	PO6	PO7	PO8	PO9	PO10	PO11
C301	3	1	1	1	1	2.25	2	1	2	1	1
C302	3	1	1	1	1	2.25	2	1	2	1	1
C303	3	3	1	1	1	3	2	2	2	1	1
C304	3	3	1	1	1	3	2	2	2	1	1
C305	2.60	1.80	1	1.60	1	1.5	2	1.50	1.50	PO10	1.80
C306	2.60	1.80	1	1.60	1	1.5	2	1.50	1.50	PO10	1.80
C307	3	2	3	1.50	1.50	PO6	2	3	1	PO10	1
C308	3	2	3	1.50	1.50	PO6	2	3	1	PO10	1
C309	2.67	1.67	2	1	2	1.84	PO7	1	1	PO10	1
C310	1.25	1	1	1	2.25	PO6	PO7	1	1	PO10	1
C311	PO1	1	1	1	PO5	PO6	2.50	1	1.20	PO10	PO11
C312	2.67	1.67	1	1	1	PO6	PO7	2.33	1.50	1	1
C313	1.33	1	1	1	1	PO6	PO7	PO8	1	PO10	PO11
C314	1	1	1.40	1	1	2.33	PO7	PO8	1	PO10	PO11
C315	1	1	1.40	1	1	2.33	PO7	PO8	1	PO10	PO11
C316	3	2.20	1.25	1.20	1.75	2.75	3	3	2.20	1.50	1.50
C317	3	2.20	1.25	1.20	1.75	2.38	3	3	2.20	1.50	1.50
C318	2.83	1.33	1	1	1.20	1.67	PO7	1	1	1	1
C319	2.83	1.33	1	1	1.20	1.67	PO7	1	1	1	1
C320	3	2.20	1	2	PO5	1.6	1.40	3	1	PO10	1
C321	3	2.20	1	2	PO5	1.6	1.40	3	1	PO10	1
C322	1.67	1	1	PO4	PO5	1	PO7	1	1	PO10	PO11
C323	1.60	1.40	1	PO4	2.20	PO6	PO7	PO8	1	PO10	1

C324	2.50	2	1	2	1	2	3	2	1.67	1	2
C401	2.67	2.33	3	2.50	2.50	2	1	1	1	1	1
C402	2.67	2.33	3	2.50	2.50	2	1	1	1	1	1
C403	3	3	3	2.67	3	PO6	1	3	3	PO10	3
C404	3	3	3	2.67	3	PO6	1	3	3	PO10	3
C405	2.60	1.80	1.80	1.60	1	1.9	1	1.25	1.20	PO10	1.80
C406	2	1.33	1	1.50	2	PO6	3	PO8	1.25	PO10	1.50
C407	3	1.50	1.50	1	1.50	3	3	3	1	1	1
C408	2.50	1.17	2.17	1	1.83	1.8	1	1	1	1	2
C409	3	2.80	1	1	PO5	PO6	PO7	PO8	PO9	3	2
C410	2.50	1	PO3	1	PO5	1	3	1.50	3	PO10	1

Course Code	PSO1	PSO2
C101	1	PSO2
C102	1	1
C103	PSO1	1
C104	1	1
C105	PSO1	1
C106	PSO1	1
C107	1	1
C108	PSO1	1
C109	1	2
C110	PSO1	PSO2
C111	PSO1	1
C112	PSO1	1
C113	1.20	1.20
C114	PSO1	1
C115	1	1
C116	PSO1	1
C117	1.20	1.20
C118	PSO1	1
C119	1	1
C120	2.60	3
C201	1	PSO2

C202	1	3
C203	1.17	1
C204	1.17	1
C205	1	1
C206	1	1
C207	1	1
C208	1	1
C209	2	3
C210	1	1
C211	1	PSO2
C212	1	1
C213	1	1
C214	1	1
C215	1	1
C216	1.20	1
C217	1	1
C218	1	1
C219	1.33	2.33
C220	1	1.25
C221	1	1
C222	1	PSO2
C301	1.40	1.20
C302	1.40	1.20
C303	2	2
C304	2	2
C305	1	1
C306	1	1
C307	1	1
C308	1	1
C309	1.33	1.83
C310	1	1
C311	PSO1	1
C312	1	1

C313	1	PSO2
C314	1.20	1
C315	1.20	1
C316	1.40	2.25
C317	1.40	2.25
C318	1	1
C319	1	1
C320	1	3
C321	1	3
C322	1	1
C323	1	1
C324	1	1
C401	2.33	1
C402	2.33	1
C403	2.50	2.17
C404	2.50	2.17
C405	1.80	1.60
C406	1	1
C407	2.50	1
C408	1.67	1.83
C409	1.40	1
C410	1	1

2 OUTCOME-BASED TEACHING LEARNING (120)

Total Marks 120.00

2.1 Describe Processes Followed to Ensure Quality of Teaching & Learning (20)

Total Marks 20.00

We at R. C. Patel Institute of Technology, Shirpur, implemented a structured framework to ensure quality in teaching and learning, aligned with Outcome-Based Education (OBE), regulatory mandates, and stakeholder expectations. Curriculum design is governed by the Board of Studies (BoS) and Academic Council (AC), incorporating industry inputs, stakeholder feedback, and NEP 2020 guidelines.

Teaching methodologies emphasize learner-centric approaches such as flipped classrooms, experiential learning, interdisciplinary projects, and information and communication technology (ICT) enabled instruction. Faculty members undergo regular training through Faculty Development Programs (FDPs), peer mentoring, and pedagogical workshops. Academic calendars and teaching plans are accurately prepared and monitored.

Term Test (TT) evaluation, activity-based evaluation, and rubric-based evaluation are components of continuous assessment (CA). Students, faculties, alumni, and employers participate in feedback channels, and course changes are driven by actionable insights. The Internal Quality Assurance Cell (IQAC) fosters continuous improvement, monitors course outcomes (COs) and program outcomes (POs) attainment, and performs academic audits.

Digital tools such as virtual labs, MOOCs, and e-content enhance accessibility and engagement. Student support is ensured through mentoring systems, remedial classes, and career guidance. Industry interaction is fostered via internships, guest lectures, and collaborative projects. Quality is further reinforced through benchmarking, strategic planning, and monitoring. This integrated approach ensures academic excellence, regulatory alignment, and holistic development of learners.

A. Curriculum Design & Revision

The mechanical engineering curriculum is systematically framed and periodically revised by the BoS and approved by the AC. Figure 2.1.1 shows the curriculum design process ensures alignment with POs, Program Specific Outcomes (PSOs), and evolving industry requirements, in accordance with the principles of OBE.

Key Features of the Curriculum Design Process:

- **Stakeholder Involvement:** The curriculum revision is a participative process involving feedback and suggestions from diverse stakeholders
- **Industry Experts:** To integrate recent trends and technologies such as solar systems, product design, system modeling & simulation, Industry 4.0, additive manufacturing (3D printing), artificial intelligence (AI), EV vehicles, robotics, and automotive systems for enhancing industry relevance.
- **Alumni:** To incorporate current professional practices, research trends, and employability skills expected in global markets.
- **Faculty Members:** To introduce research-driven and academically enriching content supporting innovation and advanced learning.
- **Students:** To collect inputs through structured feedback mechanisms regarding curriculum relevance, delivery methods, and skill-based learning.

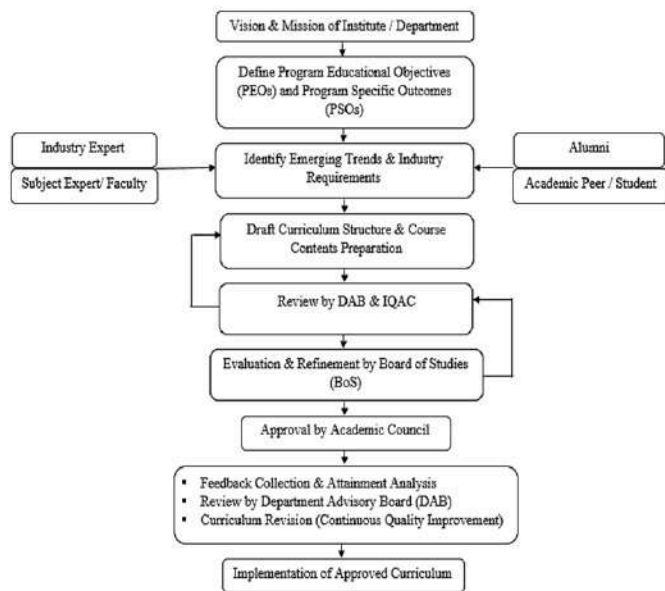


Figure 2.1.1: Process Flowchart for Curriculum Design & Revision

Curriculum Structure and Content: The curriculum maintains an appropriate balance among

- Structured core courses cover essential and advanced mechanical domains, ensuring strong theoretical and technical foundations.
- Integrated laboratories and mini-projects (semester projects) strengthen practical skills, design ability, and hands-on competency.
- Electives & Emerging Technologies: A range of electives in Advanced Materials & Manufacturing, Thermal & Energy Systems, Automation, Robotics & Mechatronics, and Design, Simulation & Optimization, and Industrial Engineering & Management support specialization and flexibility.
- Internship & Capstone Project: Industry internships and final-year projects build problem-solving skills, teamwork, innovation, and professional readiness.
- Contemporary & Societal Aspects: The curriculum includes sustainability, safety, ethics, and professional practices to promote responsible and socially aware engineering graduates.

Periodic Review and Continuous Improvement: The Mechanical Engineering program adopts a systematic and continuous review mechanism to ensure curriculum relevance, quality enhancement, and effective attainment of POs and PSOs. The process is driven by academic audits, stakeholder feedback, and recommendations from statutory bodies, enabling continuous improvement in teaching-learning and assessment practices.

- Review of technological advancements and emerging trends in mechanical engineering.
- Assessment of industrial developments and evolving professional skill requirements.
- Collection and analysis of feedback from industry experts, alumni, faculty, and students (if required).
- Evaluation of academic audit outcomes and COs-POs/PSOs attainment analysis.
- Implementation of recommendations from the BoS, IQAC, and Academic Council.

As a result of the systematic review and continuous improvement process, the curriculum remains current and relevant through the effective integration of emerging technologies and industry-driven practices.

The outcome-based curriculum design, supported by enhanced laboratory work, projects, and practical exposure, significantly improves students' employability and professional competence.

Continuous interaction with industry and incorporation of research-oriented activities strengthen the linkage between academics, industry, and research, thereby fostering innovation, experiential learning, and problem-solving skills. Furthermore, structured curriculum mapping, regular assessment, and continuous evaluation ensure effective attainment of POs and PSOs, contributing to sustained quality enhancement of the academic program.

B. Outcome-Based Education (OBE)

The Department of Mechanical Engineering follows the principles of OBE to ensure that graduates acquire the knowledge, skills, and professional competencies required by industry, society, and higher studies.

COs-POs/PSOs Mapping and Attainment for the Program

Each course offered by the department has clearly defined COs that are aligned with the POs and PSOs. CO-PO and PSO mapping is carried out using a defined correlation scale (Low/Medium/High) to ensure effective linkage between COs and POs.

This systematic mapping ensures curriculum coherence, eliminates redundancy, and strengthens alignment with graduate attributes. It helps the department verify that students progressively achieve program competencies related to engineering knowledge, design skills, communication, ethics, teamwork, and modern tool usage.

Attainment of COs is evaluated through direct and indirect assessment tools, and the aggregated CO attainment is used to determine PO and PSO attainment at the program level.

Assessment and Attainment Tracking

A structured assessment process is adopted to measure student performance and outcome attainment. Direct assessment includes Continuous Assessments (CA), end-semester examinations (ESE), laboratory evaluations, mini-projects, seminars, and capstone projects.

Indirect assessment is carried out through course exit surveys and program exit surveys. Attainment levels are calculated using predefined targets, and the results are analyzed to identify gaps.

Regular tracking of attainment provides measurable evidence of student learning and academic effectiveness. It enables early identification of learning gaps, supports data-driven academic decisions, and enhances student performance through timely remedial actions, mentoring, and curriculum enrichment.

Corrective and preventive actions are implemented through curriculum enrichment, teaching-learning improvements, and academic support mechanisms.

Tools and Documentation

The Mechanical Engineering Department maintains systematic documentation to support OBE implementation and review. Standard tools such as CO-PO/PSO mapping matrices, attainment calculation sheets, rubrics, assessment records, exit forms, and analysis reports are used.

Digital tools and spreadsheets are employed for efficient data collection, analysis, and tracking of attainment. All records are periodically reviewed by the Department Committee and academic bodies to ensure transparency, compliance, and continuous quality improvement in the teaching-learning process.

C. Teaching-Learning Process

The overall teaching-learning process is classified as Planning, Execution & Analysis Stages. The department follows a structured planning process to ensure effective delivery of the curriculum as shown in Figure 2.1.2.

C.1. Planning Phase: The process begins with the preparation of the Institute Academic Calendar and the Autonomy Syllabus

Course Choice and Load Distribution:

- Faculty members submit a Course Choice Form prior to the commencement of the semester to ensure that course distribution is aligned with their areas of expertise.
- Based on these inputs, the Teaching Load Distribution is finalized to ensure balanced workload, effective course delivery, and improved attainment of Cos.

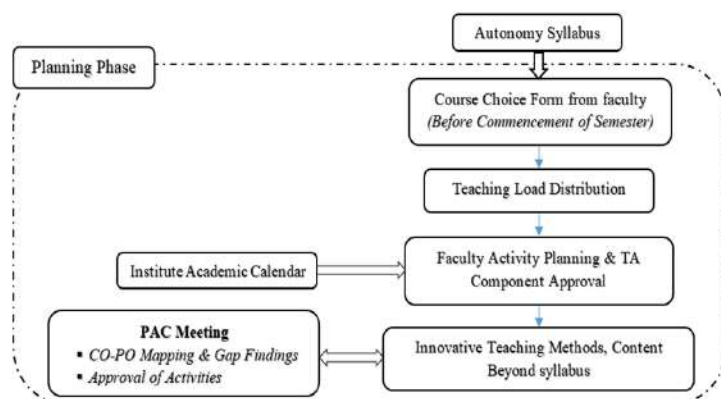


Figure 2.1.2: Planning Phase in Teaching-Learning Process

Faculty Activity Planning and Approval:

- Faculty members prepare detailed lecture-wise teaching plans.
- Teacher's Assessment (TA) components are decided to ensure effective course delivery and evaluation.
- Course content-based individual presentations, group discussions, mock interviews, model making, and many more activities are used.
- These plans are reviewed and approved by the Department to maintain alignment with COs and facilitate continuous improvement in the teaching-learning process.

Innovative Teaching Methods and Content beyond Syllabus:

- Faculty members integrate innovative pedagogical practices (e.g., interdisciplinary projects, project-based learning, collaborative learning, case studies, and ICT tools).
- Innovative components such as virtual labs, Code Chef, add-on courses, and additional content beyond the syllabus are integrated to enhance student learning and prepare them for industry demands.

Program Assessment Committee (PAC) Meeting:

- CO-PO Mapping and Gap Analysis: COs are systematically mapped to POs and PSOs to ensure alignment with the program objectives.
- Gap analysis is performed to identify areas where students may not be achieving the desired outcomes, and corrective measures are implemented.
- Review and Approval of Activities: All academic and co-curricular activities, including teaching plans, assessments, and student support initiatives, are periodically reviewed by faculty and approved by the Module coordinator / Head of Department / Dean Academics.
- This ensures alignment with course outcomes and continuous improvement in teaching-learning processes.

C.2 Execution Phase:

The Department implements the curriculum through a systematic execution process covering theory, practical/tutorials and monitoring mechanisms as illustrated in Figure 2.1.3.

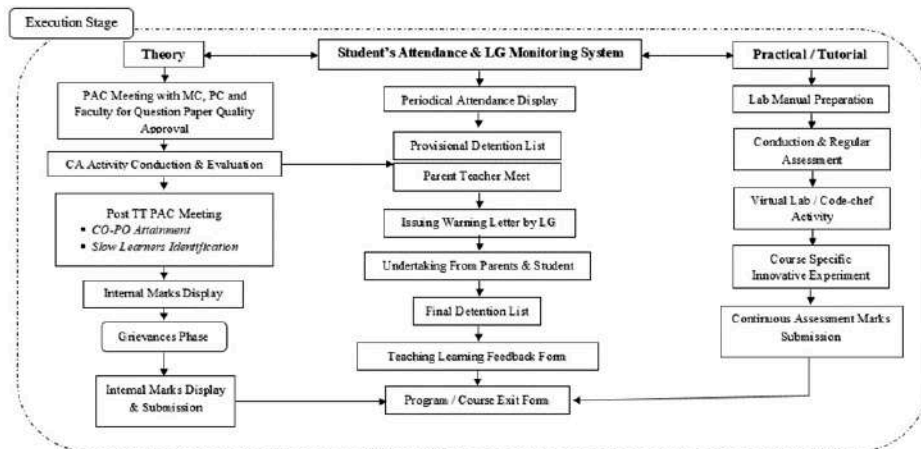


Figure 2.1.3: Execution Phase in Teaching-Learning Process

Theory Component:

- PAC meetings with the Module Coordinator (MC), Program Coordinator (PC), and Course Instructor (CI) are conducted for term test question paper quality approval.
- Question papers for the term test are designed according to Blooms Taxonomy.
- Term Tests (TT-1 & TT-2) and teacher's assessment components are conducted through continuous evaluation to effectively monitor and enhance student learning outcomes.
- After the term test, PAC meetings are conducted to review CO-PO attainment, identify slow learners for targeted academic support, and evaluate the effectiveness of teaching-learning strategies to ensure continuous improvement.
- The program supports advanced learners through value-added courses, projects, and certifications, and assists slow learners through remedial classes, mentoring, and continuous feedback, ensuring effective attainment of COs, POs, and PSOs.
- Internal marks are displayed transparently, with a grievance redressal phase before final submission.

Practical / Tutorial Component

- Faculty members prepare lab manuals and conduct regular assessments.
- Students engage in virtual labs, coding platforms, and innovative experiments beyond the curriculum.

Student Attendance and Local Guardian (LG) Monitoring System: Student attendance is monitored and displayed periodically, with provisional detention lists prepared for non-compliant students. Parent-teacher meetings and warning letters are employed to ensure timely corrective actions for students with low attendance. Students, along with their parents, submit formal undertakings when attendance falls below the required threshold.

C.3 Evaluation and Analysis Phase:

Department Evaluation and Analysis phase involved in Teaching learning Process is briefly explained in Figure 2.1.4

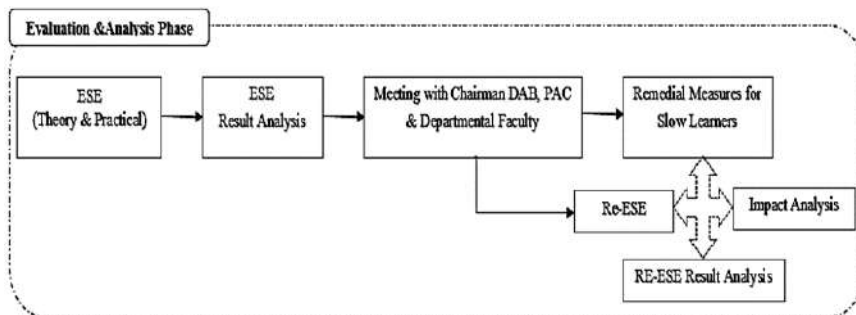


Figure 2.1.4: Evaluation & Analysis Phase in Teaching-Learning Process

ESE Examination (Theory and Practical): Students undergo End Semester Examinations (both theory and practical) as a measure of attainment of COs and POs.

Result Analysis: ESE results are analyzed to assess the level of CO attainment. The analysis identifies advanced learners, slow learners, and areas of improvement in the curriculum or teaching methods.

Review Meetings: Meetings are conducted with the Director, Controller of Examinations (COE), PAC, IQAC, and departmental faculty. The purpose is to analyze the results, identify gaps in CO-PO attainment, and plan appropriate corrective measures.

Remedial Measures for Slow Learners: Based on analysis and faculty discussions, remedial classes are organized to support slow learners, ensuring inclusive learning and enhancement of COs attainment.

Re-ESE (Supplementary Exam): Students who are eligible for a re-attempt are given the opportunity to improve their performance through a re-examination, ensuring equality and continuous learning.

Impact Analysis: Post Re-ESE, results are analyzed to measure the effectiveness of remedial actions and re-examination in improving COs attainment. Feedback from this analysis informs curriculum refinement, teaching methodology improvement, and continuous quality improvement.

The process forms a feedback loop, ensuring systematic evaluation, identification of learning gaps, corrective actions, and improved CO-PO attainment over time.

D. OBE Implementation:

Based on two decades of teaching-learning experience, the Mechanical Engineering Department has adopted the following pedagogical approaches, as shown in Figure 2.1. 5. The department adopts a structured OBE approach where teaching-learning activities are aligned with COs and POs.

Academic planning, delivery, and assessments are designed to ensure students progressively achieve the expected competencies. Continuous review and improvement mechanisms are followed to maintain effectiveness.

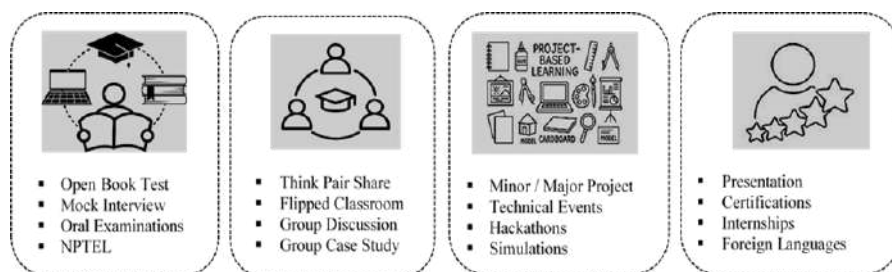


Figure 2.1.5: Pedagogical Approaches in the Teaching-Learning Process

- **Collaborative Learning Practices:** Collaborative learning is encouraged through group-centric academic tasks that promote peer interaction, shared problem-solving, and active participation. These practices help enhance communication skills, teamwork, and a cooperative learning environment within the department.
- **Project-Based Learning Integration:** Project-Based Learning is included as part of regular teaching-learning activities to provide hands-on, experiential exposure. Students engage in project work that supports concept reinforcement, innovation, and the development of analytical and design thinking skills relevant to mechanical engineering.
- **Competency and Skill Development:** The teaching-learning process emphasizes the development of essential competencies required for engineering practice. Students are encouraged to build technical proficiency, professional behavior, and problem-solving abilities through structured academic activities that complement classroom learning.

E. Faculty Development and Training

Faculty Development and Training programs have strengthened the departments capability to deliver high-quality education aligned with current trends in mechanical engineering. Through FDPs, workshops and certification courses, faculty members have enhanced their proficiency in advanced domains such as thermal engineering, design and manufacturing, renewable energy systems, CAD/CAM/CAE tools, modern pedagogical practices, and AI, as shown in Table 2.1.1. This improved expertise directly contributes to better curriculum delivery, enriched laboratory experiences, and the adoption of innovative teaching-learning methods. As a result, students gain clearer conceptual understanding, improved practical exposure, and stronger attainment of COs and POs.

Table No.2.1. 1: FDP / STTP / QIP / Workshop Completed by Faculty

Sr. No	AY	Program Name / Topic	No. of Faculty	Conducted By	Duration	Outcome / Impact
1	24-25	Artificial Intelligence	6	IIIT, Vadodara	6 Months	Enhanced faculty competency in Artificial Intelligence concepts and their application in teaching and research.

Sr. No	AY	Program Name / Topic	No. of Faculty	Conducted By	Duration	Outcome / Impact
2	24-25	Machine Learning	1	IIIT, Surat	6 Months	Strengthened knowledge of machine learning techniques enabling curriculum enrichment and project guidance.
3	24-25	High Performance Computing	1	COEP, Pune	6 Months	Improved expertise in high-performance computing for solving large-scale engineering problems.
4	24-25	Generative AI and its Multi domain Use Cases	1	VIT, Pune	5 Days	Upgraded proficiency in AI tools for vision and its Multidomain Use Cases
5	24-25	Next Generation Engineering Practices Materials design and manufacturing	4	Marathwada Mitra Mandal COE Karvenagar Pune	5 Days	Enhanced faculty understanding of advanced engineering materials, including smart materials, composites, lightweight alloys, and sustainable materials.
6	24-25	Generative AI	1	NMIMS Indore	5 Days	Enhanced competency in applying recent AI trends in teaching and projects.
7	24-25	Research to Reality: Exploring Methodology and IPR	1	DR. D. Y. Patil Institute of Technology, Pimpri, Pune-18	5 Days	Improved faculty competence in quantitative and qualitative research techniques, data collection, analysis, and interpretation.
8	24-25	AIML for Geodata Analysis	1	Indian Institute of Remote Sensing, Dehradun	5 Days	Improved knowledge of AI and Machine Learning algorithms applied to geodata analysis, including classification, clustering, regression, and pattern recognition.
9	24-25	Overview of Geographical Information System	1	Indian Institute of Remote Sensing, Dehradun	15 Days	GIS integrates spatial data and analytical tools to support effective planning, management, and decision-making across diverse disciplines.
10	24-25	Inculcating Universal Human Values in Technical Education	2	All India Council for Technical Education (AICTE)	5 Days	Strengthened understanding of NBA accreditation processes.
11	24-25	Exploring the Frontier: Additive Manufacturing & 3D Printing in Industry 4.0	3	NMIMS, Shirpur	1 Week	Improved knowledge of advanced 3D printing technologies such as FDM, SLA, SLS, DMLS, and metal additive manufacturing.

Sr. No	AY	Program Name / Topic	No. of Faculty	Conducted By	Duration	Outcome / Impact
12	24-25	Outcome Based Education and Application of Generative AI in Teaching and Research	4	Mary's College (Autonomous), Thrissur, Kerala	1 Week	Improved ability to design, map, and assess course outcomes using direct and indirect assessment tools as per NBA guidelines.
13	24-25	Gnomio Moodle for infusing Outcome based Education	2	IMRD Shirpur	5 Days	Improves continuous assessment, transparent outcome mapping, and attainment analysis, thereby enhancing teaching-learning effectiveness
14	24-25	Generative AI and its Multidomain Use Cases	1	Department of IT, VIT, Pune	5 Days	Its refers to advanced AI systems capable of creating new content such as text, images, code, audio, and simulations by learning patterns from large datasets
15	24-25	Python for Data Science	1	NPTEL	4 Weeks	Ability to analyze datasets, apply statistical and machine learning techniques using Python, and supports data-driven decision making in research and industry.
16	24-25	Data Science for Engineers	1	NPTEL	8 Weeks	Improves skills in data analysis, visualization, and predictive modeling using Python, enabling them to solve real-world engineering problems through data-driven approaches.
17	24-25	Introduction to Machine Learning	1	NPTEL	12 Weeks	Understanding of machine learning algorithms, data modeling, and predictive analytics using Python, 19enabling them to develop intelligent systems for real-world engineering applications.
18	24-25	Java Full Stack with React JS & AI	1	Amrutvahini College of Engineering, Sangamner	18 Days	Skills in backend development using Java, frontend application development with React JS, and integration of Artificial Intelligence, enabling them to build intelligent full-stack web applications for industry-oriented projects.

Sr. No	AY	Program Name / Topic	No. of Faculty	Conducted By	Duration	Outcome / Impact
19	24-25	High Performance Computing & AI	2	SPIT Mumbai	1 Weeks	Ability to use parallel computing techniques and high-speed computing architectures to solve complex problems and develop intelligent systems using Artificial Intelligence for advanced engineering and research applications.
20	24-25	Applied AI: Practical Implementations	2	TechSaksham AICTE Program	5 Days	Ability to design and deploy real-world applications using Artificial Intelligence and Machine Learning, enabling them to solve practical problems through data-driven intelligent solutions.
21	24-25	Research and Innovation Trends in Large Language Models	3	D J Sanghavi College of Engineering Mumbai	5 Days	Understanding of advanced developments in Large Language Models, enabling researchers and students to explore innovations in natural language processing, generative AI applications, and intelligent automation systems
22	24-25	AI for Sustainable Development	1	VIIT, Pune and IEEE Pune Section	5 Days	Use of AI to address global challenges such as climate change, energy efficiency, smart agriculture, and resource management, supporting the goals of the United Nations Sustainable Development Goals for a sustainable future.
23	24-25	Forbes Marshall Online Faculty Development Program	1	Forbes Marshall Pune	2 Days	Encouraged industry-academia collaboration, supporting curriculum enrichment, internships, live projects, & consultancy opportunities.
24	24-25	Capacity Building for Teachers	1	Department of Education KBC NMU, Jalgaon,	2 Days	Enhances their ability to integrate technology, pedagogy, and subject knowledge effectively, improving digital teaching practices and learning outcomes in alignment with modern education standards
25	24-25	Data Analytics in Education	1	Department of computer engineering , A Y D T, Surat	2 Days	Improve teaching strategies, and support data-driven decision making for better learning outcomes and institutional effectiveness.

Sr. No	AY	Program Name / Topic	No. of Faculty	Conducted By	Duration	Outcome / Impact
26	24-25	Young Researchers Up skilling Program	1	IEEE Computer Society Chapter, Gujarat Section	2 Days	Strengthens research skills, innovation capacity, and scientific writing abilities, enabling participants to conduct high-quality research and contribute to academic and technological advancements
27	23-24	Recent Advances in Mechanical Engineering	11	Department of Mechanical Engineering D Y Patil College of Engineering, Akurdi, Pune-44	5 Days	Grasp the competency to integrate advanced manufacturing trends with digital, automated, and data-driven approaches for improved productivity and quality in modern industries.
28	23-24	Recent trends in Renewable energy Systems	2	JSPMS Rajarshi Shahu College of Engineering, Pune.	1 Weeks	Improved ability to analyze and apply modern renewable energy technologies for sustainable and efficient power systems.
29	23-24	Recent Trends in Teaching and Learning Pedagogy (Multidisciplinary)	1	Yashoda Technical Campus, Satara	5 Days	Develop the ability to adopt innovative, learner-centric, and multidisciplinary teaching strategies aligned with outcome-based education.
30	23-24	Innovations in water treatment & sustainable infrastructure	1	Chandigarh Engineering College, Jhanjeri, Mohali	5 Days	Improved ability to gain competence to design and evaluate sustainable water treatment and infrastructure solutions using modern technologies.
31	23-24	Exploring Quality Research and its Societal Impact	2	D Y Patil College of Engineering, Akurdi, Pune-44	5 Days	Improved ability to conduct quality research addressing societal needs with measurable impact and ethical responsibility.
32	23-24	Current Trends in Mechanical Engineering-Case Studies from Industries & Academia to promote innovations, Design THinking and Startups	1	Shree Vishnu Engineering College for Women, Bhimavaram	5 Days	Improved ability to apply industry-academia best practices to promote innovation, design thinking, and startup-oriented problem solving.
33	23-24	Research and Innovations in Solar Energy	6	SSVPSs BSD CoE Dhule	5 Days	Improved ability to develop skills to design, analyze, and implement innovative solar energy systems for sustainable applications.

Sr. No	AY	Program Name / Topic	No. of Faculty	Conducted By	Duration	Outcome / Impact
34	23-24	Additive Manufacturing Technology	2	Sandip University, Nashik School of Engineering & Technology	5 Days	Improved ability to apply additive manufacturing techniques for advanced product design and rapid prototyping.
35	23-24	Innovative Teaching & Learning Pedagogy	1	RFI Care	5 Days	enhances student engagement, critical thinking, and active learning through the integration of technology, collaborative activities, and learner-centered instructional strategies
36	23-24	Alternative fuels	1	NITTTR, Bhopal	5 Days	Use of sustainable energy sources such as Biodiesel, Bioethanol, Hydrogen Fuel, and Compressed Natural Gas to reduce fossil fuel dependency, lower emissions, and support environmentally friendly energy solutions
37	22-23	Innovation, Research and IPR - Journey Towards Excellence	9	BVBs Sardar Patel College of Engineering, Mumbai & HSMs Shri. Sant Gadge Baba College of Engineering & Technology, Bhusawal	1 Week	Improved ability to acquire the ability to manage innovation, research outputs, and intellectual property for academic and industrial excellence.
38	22-23	Advances in Electrical Vehicle Industry	1	SAE India Western Section	5 Days	Improved ability to analyze and apply emerging electric vehicle technologies for sustainable mobility solutions.
39	22-23	Advances in Materials & Design (AMD-23)	1	Dept of Mechanical Engg., SVNIT Surat	1 Week	Improved ability to develop competency in selecting and designing advanced materials for high-performance engineering applications.
40	22-23	Recent Trends In Advanced Manufacturing Technology	7	D.Y. PATIL College of Engineering, Akurdi Pune-44	5 Days	Improved ability to implement advanced manufacturing technologies for improved productivity, quality, and sustainability.
41	22-23	Recent Trends In cognitive science and its application	1	Oriental University	5 Days	Improved ability to apply cognitive science principles to enhance learning effectiveness and human-centered system design.

Sr. No	AY	Program Name / Topic	No. of Faculty	Conducted By	Duration	Outcome / Impact
42	22-23	Advances in Electric Vehicle Industry	1	BVBs Sardar Patel College of Engineering, Mumbai & HSMS Shri. Sant Gadge Baba College of Engineering & Technology, Bhusawal	5 Day	Gain the ability to design and evaluate electric vehicle subsystems aligned with energy efficiency and sustainability.

During the assessment period, faculty members actively participated in various FDPs, workshops, and certification programs covering emerging and core areas of mechanical engineering. These programs, conducted by reputed academic institutions and industry bodies, enhanced faculty technical competency, pedagogical effectiveness, and research orientation, thereby strengthening curriculum delivery and outcome-based education practices. Impact of Faculty Development Programs such as

- Enhanced faculty competency in emerging and core mechanical domains, enabling effective curriculum delivery aligned with industry and research trends.
- Exposure to advanced tools and laboratory practices resulted in enriched experiments and improved practical sessions.
- Training in modern pedagogical practices and OBE strengthened teaching-learning methodologies and assessment strategies.
- Improved research capability enhanced project guidance, publications, and interdisciplinary research activities.
- Industry-oriented FDPs strengthened industry-academia linkage and relevance of student projects.

F. Academic Calendar and Planning

The Academic Calendar at R. C. Patel Institute of Technology, Shirpur, is prepared through a structured process aligned with OBE as shown in Figure 2.1.6.

- **Inputs and Data Sources:** DBATU Academic Calendar, Holiday Circular, Controller of Examinations guidance, IQAC reviews, and Departmental/event plans ensure synchronization with academic requirements.
- **Institute-Level Calendar:** An institute academic calendar is drafted to ensure uniformity, coherent planning, and timely execution of activities.
- **Approval and Finalization:** The draft is reviewed by the Director and finalized by the Academic Committee, ensuring alignment with academic objectives and POs.

Process for Preparation of Academic Calendar

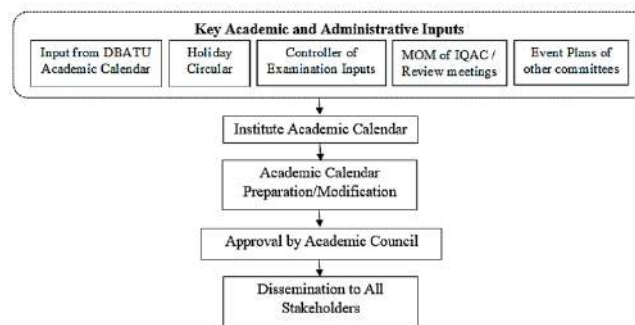


Figure 2.1.6: Academic Calendar Preparation Process Flow

The approved academic calendar is disseminated to all HoDs and faculties to facilitate systematic planning of lectures, assessments, and co-/extra-curricular activities. The calendar outlines teaching days, TA schedules, examination schedules, holidays, workshops, seminars, and co-curricular activities.

Table 2.1.2 summarizes the planned and conducted academic activities for AY 2025-26 (Odd Semester), highlighting any deviations and the reasons for the same to ensure effective academic monitoring and implementation.

Table No.2.1. 2: Academic Calendar Compliance and Deviation (AY 2025-26, SEM-I)

AY 2025-26				Odd SEM	
Sr. No	Activity / Event	Planned Date	Conducted Date	Deviation (if any)	Reason for Deviation / Action Taken
1	Commencement of Classes	14/07/25	14/07/25	NA	
2	Term Test-I	15/9/25 -17/9/25	15/9/25 -17/9/25	NA	
3	Term Test-II	13/11/25 -15/11/25	15/11/25 -19/11/25	2 days Later	Syllabus completion to assess the intended course outcomes.
4	Project Monitoring- I	13/9/25	13/9/25	NA	
	Project Monitoring- II	11/10/25	11/10/25	NA	
	Project Monitoring- III	8/11/25	8/11/25	NA	
5	Presentations/ Group Discussion	8/9/25- 10/9/25	8/9/25- 10/9/25	NA	
6	Parent Meet	22/9/25	04/10/25	12 days Later	Rescheduled to ensure higher parent participation.
7	Mock Interview	25/10/25- 28/10/25	25/10/25- 28/10/25	NA	
8	Laboratory Completion	22/11/25	22/11/25	NA	
9	End of Classes	22/11/25	22/11/25	NA	
10	ESE (TH & PR) Conduction	2nd Week to Last Week of December	2nd Week to Last Week of December	NA	

Faculty prepares teaching-learning plans aligned with the academic calendar, including weekly lecture plans, practical schedules, assignments, and internal assessments. Implementation is monitored through periodic Departmental Academic Review meetings, and necessary adjustments are made to ensure timely syllabus completion. This process ensures a uniform teaching schedule, timely conduct of assessments, and improved student performance with smooth execution of semester activities.

All academic activities, including classes, tests, labs, project monitoring, parent meetings, and examinations, were executed as per planning. Structured project monitoring and assessments enhanced CO-PO attainment, practical skills, and student engagement, while stakeholder involvement and timely evaluation improved feedback and overall learning outcomes.

G. Assessment and Evaluation

The institute implements a structured CA mechanism, as presented in Table 2.1.3, to systematically evaluate students academic performance and measure their COs attainment.

Table No.2.1.3: Term Test Evaluation & Additional Component

Component s	Description	Additional Component & Description
Term Tests (15)	TT-I = 30 Marks TT-II = 30 Marks	Certification Course – 05 Marks per course Maximum 02 course certifications

The Institute follows various teacher assessment methods as shown in Table 2.1. 4. TA-I engages students in activity-based learning such as presentations, group discussions, Moodle quizzes, or virtual labs, which enhances conceptual understanding and communication skills.

Table No.2.1.4: Contribution of Assessment Methods to Attainment of POs and PSOs.

Assessment Type	Outcome / Impact
Certification Course	Enhances PO1 (Engineering Knowledge); Promotes PO12 (Lifelong Learning); improves analytical skills.
Presentation	Improves PO10 (Communication) & PO9 (Teamwork).
Moodle Quiz	Strengthens PO1 (Engineering Knowledge) & PO2 (Problem Analysis).
Group Discussion	Enhances PO9 (Teamwork) & PO8 (Ethics).
Virtual Lab	Improves PO1, PO2 and PSOs related to practical skills.
Mock Interview	Enhances PO10 (Communication), PO9 (Teamwork), and PO8 (Professional Ethics).
Innovative Component	Encourages PO3 (Design/Development), improves PO2 & PO5 (Problem-solving/Modern Tools), supports subject PSOs.
Skill Enhancement	Develops PO6–PO9, PO11, PO12 (Societal, Teamwork, Project Management, Lifelong Learning); real-world exposure.

TA-II builds professional readiness through mock interviews, TA-III encourages innovation via pre-approved creative tasks, and TA-IV enhances skills through coding platforms and short-term internships, strengthening computational thinking and industry exposure. Aptitude tests assess analytical, reasoning, and quantitative abilities through standardized tests for each semester.

H. Conduction of Laboratory Experiments

Laboratory experiments are a vital component of the undergraduate mechanical engineering curriculum, providing students with essential hands-on experience in manufacturing and materials with theoretical concepts and developing professional engineering skills. Well-structured experiments enable learners to gain practical proficiency in CAD/CAM/CAE, engineering and fluid mechanics, material quality testing, additive manufacturing (3D printing), and modern machine tools like CNC and VMC machines.

- The department ensures effective outcome attainment through practical performance, post-lab viva-voce, and assignments.
- Along with traditional labs, the department uses virtual labs to improve hands-on learning with simulated experiments, allowing for more flexibility, practice, and access to advanced systems that physical labs cant provide.
- Additionally, subject-specific innovative experiments promote creativity, design thinking, and application-oriented learning aligned with emerging industry trends and societal needs.
- Regular feedback and corrective measures strengthen conceptual clarity, practical competence, and overall student performance.

Overall, the Teachers Assessment framework ensures a balanced development of knowledge, innovation, communication, and professional skills, supporting COs attainment and reinforcing outcome-based education and continuous improvement.

I. Feedback Mechanism

Stakeholder feedback is systematically analyzed and used to improve curriculum content, teaching methodologies, assessment strategies, laboratory practices, and learning resources. The feedback has resulted in a more comprehensive curriculum, the addition of topics that are relevant to the industry, the use of active learning methods, better infrastructure, and more support for students. This has all helped students reach their COs, POs, and PSOs.

The department regularly collects structured feedback from key stakeholders to support continuous improvement. Employer feedback assesses graduates' technical competence and industry readiness, faculty feedback reviews curriculum adequacy and teaching-learning effectiveness, alumni feedback evaluates curriculum relevance to careers and higher studies, and parent feedback reflects student progress, discipline, and institutional support. The analysis of this feedback directly contributes to curriculum enhancement, improved delivery, and better attainment of POs.

Collected feedback is analyzed by the Feedback Coordinator, and all records and action-taken reports are documented and verified by IQAC.

J. Monitoring and Audit

The institute has established a comprehensive monitoring mechanism to ensure effective implementation of academic processes and continuous quality improvement. Table 2.1.5 outlines the frequency, scope, and outcomes of various internal and external monitoring practices aimed at strengthening teaching and learning processes and enhancing CO-PO attainment.

Table No.2.1.5: Internal Quality Assurance and Monitoring Activities

Monitoring Mechanism	Frequency	Scope / Activities	Outcome / Impact
Internal Academic Audits	Per Semester	Syllabus coverage, teaching-learning & assessment plans, CA/ESE records	Ensures academic plan adherence, identifies gaps, and takes corrective actions
Peer Reviews	Continuous Per Semester	Lecture & lab observations, project supervision, feedback on teaching-learning	Improves teaching-learning effectiveness, aligns with COs
IQAC-Led Monitoring	Three per Semester	Academic calendar, adherence to course delivery, CA/ESE oversight, project evaluation	Ensures teaching-learning quality and transparent assessment, systematic improvement in CO-PO attainment
External Academic Audits	Once Per Year	Audit by external experts on syllabus coverage, course files	Ensures impartial review, validates academic quality.

These processes review syllabus coverage, teaching plans, assessments, and project progress, resulting in improved course delivery, transparent evaluation, and enhanced faculty performance. The impact is evident in better CO-PO attainment, higher student engagement, and continuous quality improvement.

K. Student Support and Mentoring

The Mechanical Engineering Department has a structured mechanism to identify and support students based on their learning abilities. The process begins with continuous student feedback, which is collected through multiple sources such as:

- Course Coordinator and Class Teacher observations
- Local Guardian (LG) interactions
- Performance in TT and TA Activities.

All these inputs help in assessing student's comprehension level, academic progress, and learning challenges. Based on this assessment, students are broadly categorized into two groups:

- Slow Learners
- Advanced Learners

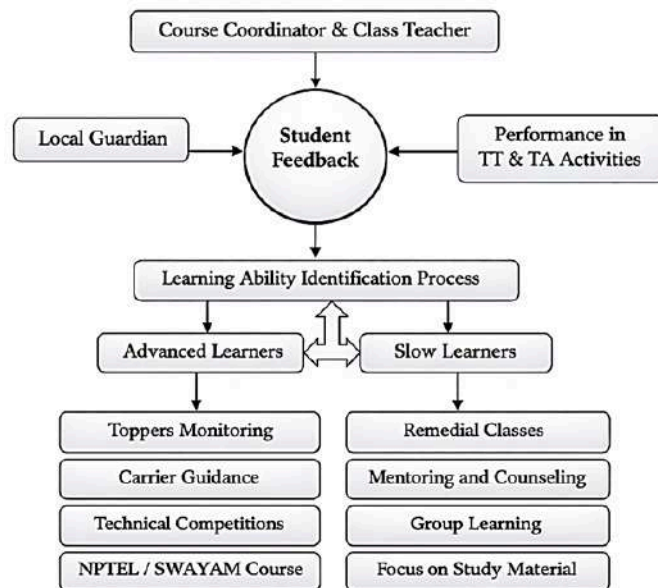


Figure 2.1.7: Learning Ability Identification and Student Support Mechanism

Students who consistently demonstrate higher academic performance, strong conceptual understanding, and active participation are identified as advanced learners. Students are identified based on strong academic performance, active participation, and faculty recommendations. They are supported through research projects, NPTEL/SWAYAM courses, certifications, technical competitions, and focused mentorship. These initiatives aim to promote research orientation, enhance technical and problem-solving skills, and prepare students for higher education and professional excellence, resulting in improved achievements, publications, and enhanced employability.

Students who require additional academic support or demonstrate average – lower conceptual clarity are identified as slow learners based on poor performance in internal assessments, low attendance or engagement, and faculty and LG feedback. These students are supported through remedial classes for difficult subjects, one-to-one mentoring and counseling, peer and group learning mechanisms, and simplified study materials with additional practice sessions.

The primary objectives are to bridge learning gaps, strengthen conceptual understanding, enhance confidence, and reduce failure or dropout rates. As a result, students show improved academic performance, better participation in learning activities, increased motivation, and enhanced course outcome attainment. Overall, this structured process for identifying learning abilities ensures personalized, student-centric support, provides growth opportunities for advanced learners, provides timely assistance for slow learners, and leads to overall improvement in COs and POs.

L. Use of ICT and Quality of Classroom Teaching

The Mechanical Engineering Department effectively integrates ICT and digital tools to enhance the quality of teaching and learning and to ensure better attainment of COs and POs, as shown in Table 2.1. 6. Faculty members adopt a blended teaching approach using multimedia, simulation platforms, online resources, and digital assessment tools.

Table No.2.1.6: Use of ICT & Digital Tools in Teaching Learning Process

Aspect	Description
Purpose	The department integrates ICT and digital tools to enhance teaching-learning quality.
Teaching Approach	The Department implements blended learning through the use of multimedia presentations, animations, smart boards, and digital resources.
Design Simulation & Virtual Lab Tools	Engineering drafting and layouts, 3D modelling, and online experiments for mechanics, thermodynamics, and fluid with virtual labs.
Online Learning Resources	NPTEL/SWAYAM videos, e-books, digital repositories

Aspect	Description
Digital Content Delivery Platforms	Google Classroom, MS Teams, and Moodle for assignments, notes, announcements, and communication.
Project & Publication Support	Plagiarism checking, paraphrase tools, and open-source tools for data-driven mechanical engineering applications and license copies of finite element analysis (FEA), CAD/CAE, computational fluid dynamics (CFD), thermal systems, manufacturing optimization, robotics, and automation.

ICT-based learning enhances the teaching-learning process by improving conceptual understanding through simulations and multimedia tools, increasing student engagement, providing 24x7 access to learning resources, enabling transparent digital assessments.

M. Industry Interaction and Exposure

The department ensures continuous industry interaction to enhance practical knowledge, professional skills, and employability among students.

- Conducted on-campus training and interaction sessions by industry professionals to bridge the gap between academic learning and industry requirements.
- Conducted guest lectures, expert talks, and technical sessions delivered by professionals from industry and research organizations.
- Facilitated short-term and semester-long internships in reputed industries, startups, and research organizations to gain hands-on experience.
- Promoted industry-oriented projects, participation in hackathons, and technical workshops to encourage problem-solving and innovation.
- Encouraged students to pursue industry-recognized certifications and skill-based training programs aligned with emerging technologies.

N. Research and Innovation Promotion

Students actively participate in hackathons and national-level competitions such as Smart India Hackathons (SIH) and Ideathon, which significantly enhance creativity, teamwork, design thinking, and problem-solving abilities, thereby contributing to PO's attainment related to innovation, teamwork, and modern tool usage. Supporting evidence includes participation certificates, awards, and achievement records.

In addition, activities conducted through the Institution's Innovation Council (IIC) and Entrepreneurship Cell foster an entrepreneurial mind-set by encouraging idea generation, start-up development, and innovation-driven projects. These programs make POs stronger when it comes to entrepreneurship, leadership, and lifelong learning.

The department actively promotes research, innovation, and experiential learning through structured institutional platforms such as RCPIT Motorsport Club, AakrutiX, and many more. These platforms provide students with opportunities for interdisciplinary collaboration, leadership development, and innovation-oriented engagement beyond the classroom. The department encourages students to explore emerging technologies and tackle real-world engineering challenges through workshops, technical sessions, expert talks, project exhibitions, outreach activities, and research-focused initiatives.

Active participation in these clubs enhances students' research aptitude, analytical thinking, and problem-solving skills, while also strengthening professional competencies such as teamwork, communication, ethical responsibility, and lifelong learning. The gained exposure supports the development of innovative project ideas, research publications, competitive participation, and community-oriented technological solutions.

Overall, the activities contribute significantly to the attainment of POs related to engineering knowledge, design and development of solutions, modern tool usage, teamwork, communication, and societal responsibility.

O. Quality Improvement Initiatives

The Mechanical Engineering Department implements well-defined quality improvement initiatives to strengthen the teaching-learning process and ensure sustained academic excellence. The department systematically reviews these initiatives through data-driven analysis and stakeholder feedback, aligning them with OBE principles.

Continuous monitoring of academic outcomes enables the department to enhance curriculum delivery, assessment methods, and the overall student learning experience.

The following section outlines the Key Quality Improvement Initiatives and their impact on the teaching-learning process. Are

COs-POs Attainment Analysis:

- Regular analysis of CO-PO attainment using direct and indirect assessment tools.
- Identification of learning gaps and weak outcome areas at course and program levels.
- This leads to improvement in teaching strategies, focused remedial actions, better assessment design, and enhanced student performance.

Benchmarking Practices:

- Comparison of curriculum structure, course content and laboratory practices with peer institutions.
- Adoption of best practices such as innovative teaching methods, modern tools, and industry-relevant content.
- Ensures curriculum relevance, improves instructional quality, and enhances student employability and practical competence.

Continuous Improvement through IQAC:

- Active participation in IQAC led academic audits, feedback analysis, and quality reviews.
- Promotes structured academic planning, consistency in teaching learning processes, accountability, and a culture of continuous quality enhancement.

Overall, these initiatives result in a more effective, student centric teaching-learning environment, improved outcome attainment and quality assurance in the Mechanical Engineering program.

2.2 Quality of Student Capstone Project (25)

Total Marks 25.00

According to the curriculum, the Capstone Project is divided into two stages: Project Stage-I (Semester-VI) and Project Stage-II (Semester-VII). The curriculum outlines the activities for each stage in Table 2.2.1.

Table No.2.2.1: Project Stages and Detail Description

Project Stage	Activities / Description
<p align="center">Project Stage-I: [Sem-VI]</p> <p>Problem Identification & System Design</p>	<ul style="list-style-type: none"> • Preparation of a concise abstract and detailed introduction covering the problem domain, objectives, scope, relevance, and a comprehensive literature review of existing systems. • Design of the proposed system detailing architecture, methodology, and required hardware implementation. • Development of a clear implementation plan for Stage II, including selected tools and an execution timeline.
<p align="center">Project Stage-II: [Sem- VII]</p> <p>System Development & Evaluation</p>	<ul style="list-style-type: none"> • Implementation of the proposed system using appropriate tools and platforms. • Testing, validation, and performance evaluation with comparative analysis. • Conclusion and future scope identification based on results. • Preparation and submission of a project report. • Preparation and submission of a research paper/patent based on project outcomes.

The Department of Mechanical Engineering follows the procedure outlined in Figure 2.2.1 for identifying projects and allocating them to faculty members.

A. Identification of Projects and Allocation Methodology

The project development process at R C Patel Institute of Technology, Shirpur, is systematically designed in line with the OBE framework to ensure effective planning, execution, and evaluation of student projects.

The Head of the Department appoints a Project Coordinator to systematically manage, supervise, and monitor all project-related activities. Students are then required to form project groups and submit three proposed project topics along with concise abstracts for review, ensuring appropriate evaluation and approval before project initiation.

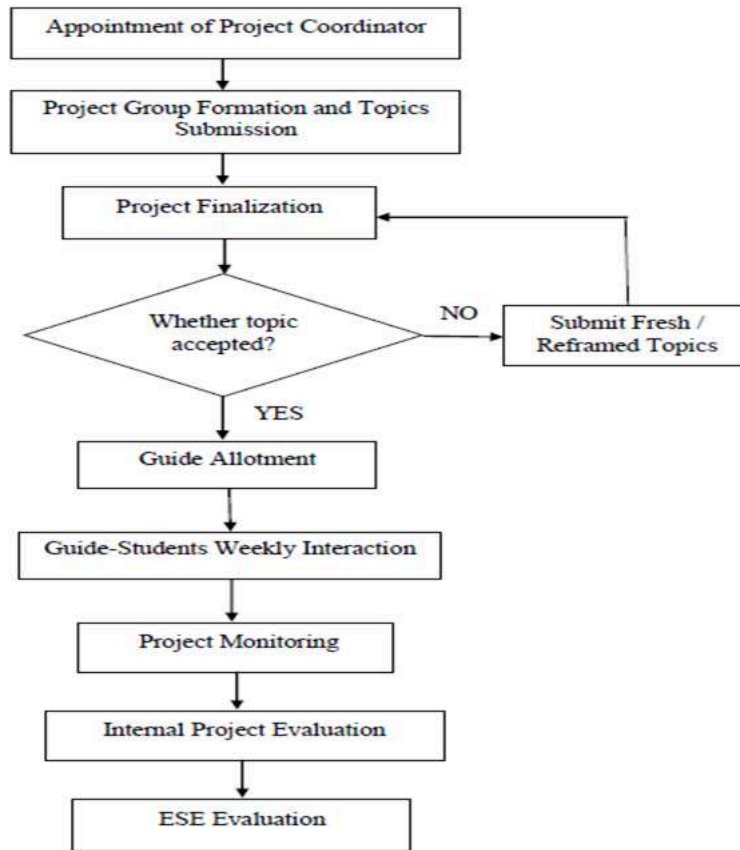


Figure 2.2.1: Process Flow for Project Topic Approval, Execution and Evaluation

- **Topic Finalization by Departmental Committee:** Proposed project topics are rigorously evaluated based on relevance, innovation, technical depth. Topics not meeting the criteria are refined and resubmitted, while approved topics proceed to execution.
- **Guide Allocation:** Department Head & Project Coordinator allocate faculty guides based on domain expertise, ensuring effective technical guidance, mentoring, and outcome-oriented supervision.
- **Weekly Interaction and Monitoring:** Structured weekly meetings during scheduled project hours facilitate continuous progress monitoring, technical discussion, and timely resolution of challenges.
- **Project Review and Internal Evaluation:** Periodic reviews during regular monitoring, presentations, and internal assessments are conducted to evaluate innovation, methodology, implementation quality, and attainment of course outcomes.
- **Final Evaluation by External Examiner:** The completed project is assessed by an external expert using predefined rubrics, focusing on technical competence, originality, and overall outcome attainment, ensuring transparency and academic rigor.

B. Project Monitoring and Assessment

The projects progress is systematically monitored through three monitoring stages. Each stage evaluates predefined activities such as documentation, literature review, requirement analysis, planning, fabrication, testing, and implementation, and progress is assessed using clear parameters (complete/incomplete) to ensure timely execution, quality compliance, and readiness for subsequent project phases as shown in Table 2.2.2.

Table No.2.2.2: Continuous Monitoring of Project Stage-I (Semester VI)

Monitoring Stage	Activities
Monitoring –I (Project Initiation & Study)	<ul style="list-style-type: none"> • Status of log book up to Monitoring–I • Introduction and problem definition with objectives • Literature review and analysis of existing systems
Monitoring –II (Design, Simulation Logic)	<ul style="list-style-type: none"> • Status of log book up to Monitoring–II • Designing, simulation logic and component selection • Implementation plan for Project Stage-II
Monitoring –III (Implementation, Testing & Documentation)	<ul style="list-style-type: none"> • Status of log book up to Monitoring–III • Partial implementation (20–25%) • Submission of soft copy of Project Stage-I report

Each project is assessed through CA and graded based on project quality and consistent work progress. Table 2.2.3 presents the internal assessment rubrics for Project Stage-I (PS-I).

Table No.2.2.3: Continuous Assessment Rubrics for Project Stage-I

Attendance	Logbook Maintenance	Literature Review	Depth of Understanding	Report	Total
05	05	05	05	05	25

The final project demonstration and the report are evaluated by a panel of external examiners. ESE evaluation for Project Stage–I (Semester VI) is structured to assess multiple aspects of the project, as outlined in Table 2.2.4.

Table No.2.2.4: ESE Assessment Rubrics for Project Stage-I

Project Stage – I Selection	Design / Simulation / Logic	Hardware / Programming	Result verification	Presentation	Total
5	5	5	5	5	25

Project stage I is continued as Project stage II in Semester VII, focusing on completing the remaining implementation as per the approved abstract shown in Table 2.2.5.

Students plan and execute the project systematically to ensure completion within the semester timeline.

Table No.2.2.5: Continuous Monitoring of Project Stage-II (Semester VII)

Monitoring Stage	Activities
Monitoring –I	<ul style="list-style-type: none"> • Verification of log book up to Monitoring–I • Design /Analysis progress up to 40%
Monitoring – II	<ul style="list-style-type: none"> • Verification of log book up to Monitoring–II • Fabrications & Demonstrations and implementations.
Monitoring – III	<ul style="list-style-type: none"> • Verification of log book up to Monitoring–III • Project completion & Publication Review • Submission of complete project report

- Project stage II emphasizes design, fabrication, experimentation, testing, data analysis, and documentation. The ICA and ESE assessment rubrics for Project Stage II are shown in Table 2.2.6 & Table 2.2.7, respectively.

Table No.2.2.6: Continuous Assessment Rubrics for Project Stage-II

Attendance	Logbook Maintenance	Literature survey	Depth of Understanding	Report	Total
05	05	05	05	05	25

Table No.2.2.7: ESE Assessment Rubrics for Project Stage-II

Depth of Understanding	Implementation	Testing	Report	Presentati on	Total
05	05	05	05	05	25

- Each group maintains a project logbook and submits a hardbound project report at the end of Semester VII.
- Relevant domain knowledge beyond the core syllabus is applied for effective project implementation.

C. Capstone Project Timeline

A well-defined project timeline ensures systematic planning, timely execution, and effective monitoring of Project Stage-I and Stage-II as elaborated in Table 2.2.8 and Table 2.2.9, respectively.

Table No.2.2.8: Timeline for Project Stage -I (Semester-VI)

Sr. No.	Activity	Tentative Period
1	Project registration and submission of three probable topics with abstract	Third week of January
2	Scrutiny, topic finalization, and guide allocation by the Head of Department and project coordinator.	Last week of January
3	Introduction, literature review, and requirement analysis	Second week of February
4	Project planning, scheduling	Last week of February
5	Monitoring-I of Project Stage-I	First week of March
6	Conceptual Design and Methodology	Second week of March
7	Implementation plan for Project Stage-II	Third week of March
8	Monitoring-II of Project Stage-I	First week of April
9	Completion of Project Stage-I with report submission (as per guide approval)	Second week of April
10	Monitoring-III of Project Stage-I	First week of May

Table No.2.2.9: Timeline for Project Stage -II (Semester-VII)

Sr. No.	Activity	Tentative Period
1	System Implementation up to 40%.	Third Week of August
2	Monitoring-I of Project Stage-II	Second week of September
3	System Implementation up to 70%.	Third week of September
4	Demo of Project Stage-II (In front of departmental committee).	Second week of October
5	System Implementation up to 100%.	Last week of October

Sr. No.	Activity	Tentative Period
6.	Demo of Project Stage-II (In front of departmental committee).	First week of November
7	Completion of Project Stage-II along with the report in prescribed format by the approval of concerned guide	Third week of November

It facilitates structured progress from topic selection to implementation and evaluation, promotes optimal utilization of time and resources, enhances coordination between students and guides, and supports continuous assessment.

D. Domain-wise Categorization of Student Projects

Capstone projects are designed to integrate theoretical knowledge with practical implementation, enabling students to solve real-world engineering problems. These projects promote innovation, research aptitude, interdisciplinary learning, and industry readiness. To ensure focused development and domain expertise, Capstone Projects are broadly categorized into the following domains:

- Materials Engineering, Manufacturing Processes & Production Systems
- Thermal Engineering & Energy Systems
- Environmental Engineering & Sustainable Technologies Renewable Energy Systems
- AI & IoT Integrated Systems
- Design and Analysis
- Robotics, Control & Industrial Automation
- Automotive Engineering, Vehicle Dynamics & Mechatronic Systems

The following Table 2.2.10 presents the year-wise distribution of capstone projects across various technical domains along with their corresponding POs and PSO mapping, demonstrating the departments commitment to OBE.

Table No.2.2.10: Domain-wise Categorization of Capstone Projects

Sr. No.	Project Areas	No. of Capstone Projects			Mapping with POs	Mapping with PSOs
		25-26	24-25	23-24		
1	Materials & Manufacturing processes	3	2	6	PO1 to PO12	PSO 1, PSO 2
2	Thermal Engineering & Energy Systems	1	2	3	PO1 to PO12	PSO 1, PSO 2
3	Renewable Energy Systems	3	1	3	PO1 to PO12	PSO 1, PSO 2
4	AI & IoT Integrated Systems	2	2	4	PO1 to PO12	PSO 1, PSO 2
5	Design and Analysis	2	3	1	PO1 to PO12	PSO 1, PSO 2
6	Robotics, Control & Automation	1	1	3	PO1 to PO12	PSO 1, PSO 2
7	Automotive Engineering	0	1	5	PO1 to PO12	PSO 1, PSO 2
Total		12	12	25		

Following Table 2.2.11 shows the mapping of sample Capstone projects for the Academic Year 2023-24 to 2025-26.

Table No.2.2.11: Sample Capstone projects Domain-wise PO, PSO & SDG Mapping

Domain Name: Materials & Manufacturing						
AY	Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
25-26	Design and Fabrication of Vertical-Axis Wind Mill Power Generation System or Household Application	Prof. S V Yeole	Environment, Ethics, Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 13
25-26	Design and Fabrication of an Automated Cotton Wick Making Machine	Prof. R R Ozarkar	Environment Safety, Ethics, Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 8, SDG 9
25-26	Automatic Waste Segregation System	Dr. P S Patil	Environment, Safety, Ethics Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 11, SDG 12
24-25	Development of Vibrating Weight Loss Machine	Prof. R R Ozarkar	Environment Safety, Ethics, Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 3
23-24	Sea Water Desalination and Purifier Machine	Prof. K D Deore	Environment, Safety, Ethics, Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 6, SDG 3
23-24	Energy Harvesting Using Piezoelectric Material	Dr. N G Shinde	Environment, Safety, Ethics Cost	Research	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 9
23-24	Utilization of Fused Deposition Modelling on the Production of Poly-Lactic Acid (PLA) Bone structures.	Prof. K D Chaudhari	Environment, Safety, Cost	Research	PO1 to PO12, PSO1, PSO2	SDG 3, SDG 9
23-24	Agriculture Multipurpose Power Weeder Machine	Prof. Dr. H K Wagh	Environment, Safety, Ethics Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 2, SDG 8
23-24	Design and fabrication of advanced water cooler	Prof. S V Yeole	Environment, Safety, Ethics Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 6, SDG 3

Domain Name: Thermal Engineering & Energy Systems						
AY	Project Name	Guide Name	Key Factors	Type of Project	POs and PSOs Mapping	Mapping to SDG
25-26	Experimental Investigation of Solar Air Dryer with Rectangular Duct with Different Blockage Ratio Ribs and Predict the Efficiency through Machine Learning Model	Dr. K A Saner	Environment, Safety, Ethics Cost	Research	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 9, SDG 12
24-25	Solar Absorption Refrigeration System Using CFD	Prof. B Y Patil	Environment, Safety, Ethics Cost	Research	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 9, SDG 13
24-25	Experimental Investigation of Solar Air Heater with Augmented Surface	Prof. N M Shinde	Environment, Safety, Ethics Cost	Research	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 9
23-24	Design and Fabrication of Solar Assisted Thermal Storage System	Prof. B Y Patil	Environment, Safety, Ethics Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 13
23-24	Thermal Analysis of Natural Ventilation System	Prof. M R Patil	Environment, Safety, Ethics Cost	Research	PO1 to PO12, PSO1, PSO2	SDG 11, SDG 13

Domain Name: Design and Analysis						
AY	Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
25-26	CFD Analysis of Solar ETC using Energy Storage	Dr. B Y Patil	Environment, Safety, Ethics, Cost	Design	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 9, SDG 13
25-26	Optimizing Ceiling Fan Noise through Blade Modification	Prof. M R Patil	Environment, Safety, Ethics, Cost	Design	PO1 to PO12, PSO1, PSO2	SDG 3, SDG 9, SDG 11

Domain Name: Design and Analysis						
AY	Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
24-25	Design and Analysis of Injection Molding Machine	Prof. Dr. H K Wagh	Environment, Safety, Ethics, Cost	Design / Analysis	PO1 to PO12, PSO1, PSO2	SDG 9, SDG 8
24-25	Design and Analysis of Double Pass Solar Air Heater with Different Ribs Surfaces	Prof. N M Shinde	Environment, Safety, Ethics, Cost	Research / Analysis	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 9, SDG 13
24-25	Design and Development of Automatic Fustigation System	Prof. M R Patil	Environment, Safety, Ethics, Cost	Design / Fabrication	PO1 to PO12, PSO1, PSO2	SDG 2, SDG 3
23-24	Design and Development of a Multi-Purpose Plastic Recycling Machine	Prof. P D Jamadar	Environment, Safety, Ethics, Cost	Fabrication / Design	PO1 to PO12, PSO1, PSO2	SDG 12, SDG 11, SDG 13

Domain Name: AI & IoT Integrated Systems						
AY	Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
25-26	IoT-based Automatic Agriculture Pesticide Spray Robot	Dr. K A Saner	Environment, Safety, Ethics, Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 2, SDG 8, SDG 9
25-26	Smart Material Handling System	Dr. P S Patil	Environment, Safety, Ethics, Cost	Application	PO1 to PO12, PSO1, PSO2	SDG 8, SDG 9
24-25	Development of Smart and Sustainable Cabinet for Farmers	Prof. S V Yeole	Environment, Safety, Ethics, Cost	Application	PO1 to PO12, PSO1, PSO2	SDG 2, SDG 12
24-25	Mobile Controlled Robot with End Effector (Pick and Place)	Prof. K A Saner	Environment, Safety, Ethics, Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 8, SDG 9

Domain Name: AI & IoT Integrated Systems						
AY	Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
23-24	ANPR Parking System (Automatic Number Plate Recognition System)	Prof. Y R Pathak	Environment, Safety, Ethics, Cost	Design	PO1 to PO12, PS01, PS02	SDG 9, SDG 11
23-24	Design and Fabrication of an IoT based Low-Cost Ventilator	Prof. P K Patil	Environment, Safety, Ethics, Cost	Design	PO1 to PO12, PS01, PS02	SDG 3, SDG 9
23-24	Design and Development of Smart Mirror using Raspberry Pi	Prof. A H Kumbhar	Environment, Safety, Ethics, Cost	Design	PO1 to PO12, PS01, PS02	SDG 9, SDG 1

Domain Name: Robotics, Control & Automation						
AY	Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
25-26	Material Assistant Robot	Dr. P D Jamadar	Environment, Safety, Ethics, Cost	Product	PO1 to PO12, PS01, PS02	SDG 8, SDG 9
24-25	Automatic Water Valve Control Farming System	Dr. P S Patil	Environment, Safety, Ethics, Cost	Application	PO1 to PO12, PS01, PS02	SDG 2, SDG 6, SDG 9
23-24	Topology Optimization of Displacement Amplification Mechanism	Prof. R R Ozarkar	Environment, Safety, Ethics, Cost	Research	PO1 to PO12, PS01, PS02	SDG 9
23-24	Design and Fabrication of Robotic Ropeway for Effective Material Handling	Prof. Y R Pathak	Environment, Safety, Ethics, Cost	Fabrication	PO1 to PO12, PS01, PS02	SDG 8, SDG 9

Domain Name: Automotive Engineering						
AY	Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
24-25	All Weather Protection Shield for Bikers	Prof. A H Kumbhar	Environment, Safety, Ethics, Cost	Product	PO1 to PO12, PS01, PS02	SDG 3, SDG 11
23-24	Development of Hydrogen Fuel System from Water for Future Vehicles	Prof. P L Sarode	Environment, Safety, Ethics, Cost	Research	PO1 to PO12, PS01, PS02	SDG 7, SDG 9, SDG 13
23-24	Performance Evaluation of CI Engine Using Fuel Doped with Metal Oxide Nanoparticles Synthesized Using Green Approach	Prof. K D Chaudhari	Environment, Safety, Ethics, Cost	Research	PO1 to PO12, PS01, PS02	SDG 7, SDG 9, SDG 12, SDG 13
23-24	Automatic Pneumatic Bumper and Brake Actuation Before Collision, All Weather Protection Shield for Bikers	Prof. M R Patil	Environment, Safety, Ethics, Cost	Application	PO1 to PO12, PS01, PS02	SDG 3, SDG 9, SDG 11

Domain Name: Renewable Energy Systems						
AY	Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
25-26	Experimental Investigation of Solar ETC (Evacuated Tube Collector) Based Energy Storage Using Phase Change Material	Dr. B Y Patil	Environment, Safety, Ethics, Cost	Research	PO1 to PO12, PS01, PS02	SDG 7, SDG 9, SDG 13
25-26	Comparative Study of Solar Stills	Prof. M R Patil	Environment, Safety, Ethics, Cost	Research	PO1 to PO12, PS01, PS02	SDG 6, SDG 7, SDG 13

Domain Name: Renewable Energy Systems						
AY	Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
25-26	Experimental Investigation and Machine Learning Optimization of Solar Air Heater Efficiency with Different Blockage Ratios and Configurations	Prof. N M Shinde	Environment, Safety, Ethics, Cost	Research	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 9, SDG 12
24-25	Thermosyphon Water Purification System	Prof. P L Sarode	Environment, Safety, Ethics Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 6, SDG 3, SDG 7
23-24	Solar Chargeable Electric Scooter	Dr. N G Shinde	Environment, Safety, Ethics Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 9, SDG 13
23-24	Solar Powered Electric Vehicle Charging Station – Conceptualization and Execution	Prof. J S Khatik	Environment, Safety, Ethics Cost	Application	PO1 to PO12, PSO1, PSO2	SDG 7, SDG 9, SDG 13
23-24	Design and Development of Solar Still	Prof. K D Deore	Environment, Safety, Ethics, Cost	Product	PO1 to PO12, PSO1, PSO2	SDG 6, SDG 7, SDG 13

Internship and Industrial Training provide Mechanical Engineering students with practical industry exposure, enabling them to apply theoretical knowledge to real-world engineering problems and understand professional practices and emerging technologies. These programs enhance technical skills, problem-solving ability, teamwork, and industry readiness, thereby improving employability and contributing effectively to Pos/PSOs attainment.

A. Process of Internship/ Industrial Training for Students:

Our institute designs the internship process to ensure a smooth and systematic placement and training experience for students. Figure 2.3.1 presents the detailed steps involved in the internship process.

Step 1: Registration Form Release: The Training & Placement (T&P) Department floats the internship registration form based on the eligibility criteria provided by the recruiting company. This form contains all necessary details regarding eligibility and requirements.

Step 2: Student Registration: Students who meet the eligibility criteria must register themselves by submitting the completed registration form within the stipulated deadline communicated by the T&P Department.

Step 3: Scheduling of Campus Drive: The campus drive date is finalized through discussions and coordination between the T&P Department and the company officials.

Step 4: Pre-Placement Talk: The company conducts a pre-placement talk by introducing the working domain, organizational culture, promotion policies, bond or service agreement terms, internship or training duration, stipend details, and other relevant information to the students.

Step 5: Aptitude Test Round: Most companies begin the selection process with an aptitude test to evaluate students’ problem-solving skills, logical reasoning, and quantitative aptitude.

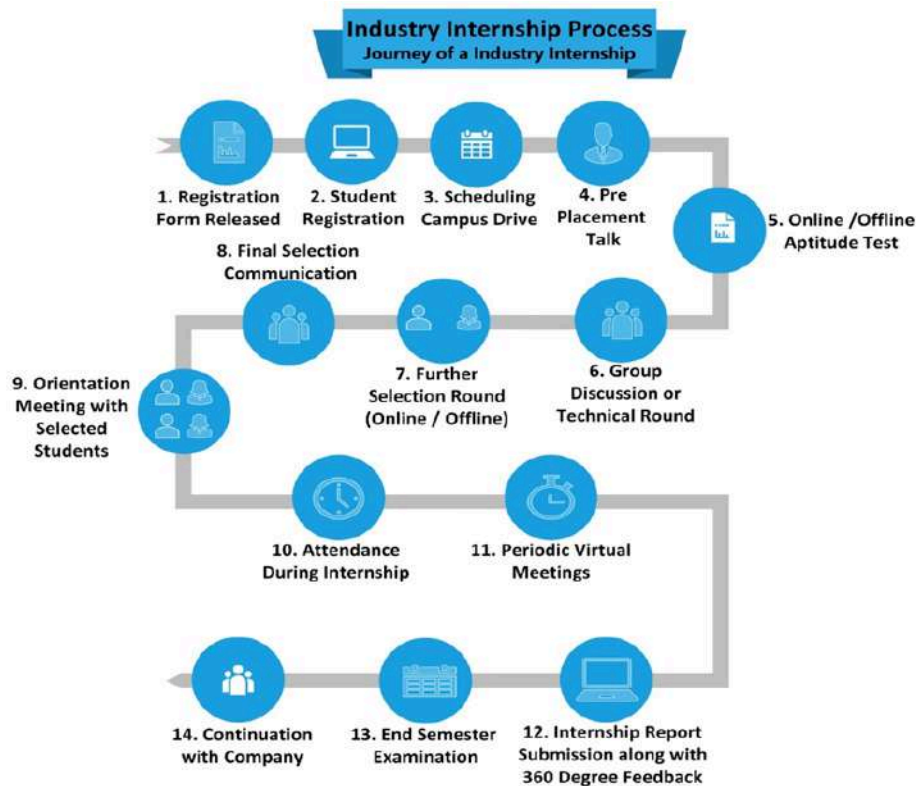


Figure 2.3.1: Flowchart of Industry Internship Process

Step 6: Group Discussion (GD) or Technical Round: Students who clear the aptitude test are shortlisted for the next round, which may be either a group discussion or a technical interview, depending on the company’s recruitment process.

Step 7: Further Selection Rounds: Based on the availability of technical experts or panel members, the company decides whether subsequent rounds will be conducted in an online or online/offline mode.

Step 8: Final Selection Communication: After completion of all rounds, the company sends the final selection list to the Training & Placement Officer (TPO), who then officially communicates the results to the selected students.

Step 9: Orientation Meeting for Selected Students: Upon receiving the final selection list, the T&P Department conducts a meeting with the selected students to provide important instructions regarding the internship start and end dates, attendance policies, and other guidelines.

Step 10: Attendance during Internship: Students undergoing the internship are permitted to attend their regular college examinations scheduled during the internship period without any hindrance.

Step 11: Periodic Virtual Meetings: The T&P Department organizes monthly virtual meetings with the students and their assigned mentors or trainers to discuss progress, address concerns, and ensure the smooth conduct of the internship. These meetings are scheduled based on the availability of mentors/trainers.

Step 12: Internship Report Submission: At the end of the internship, students are required to submit a comprehensive internship report in the prescribed format provided by the institute.

Step 13: End Semester Examination (ESE): Finally, after the completion of the internship, all students must appear for the ESE as per the academic schedule.

Step 14: Continuation of Students: After the ESE, students who perform well according to company officials can resume their duties following the timeline provided by those officials.

B. Mapping of Internship/ Industrial Training with POs and PSOs:

Table 2.3.1 summarizes the details of student internships, highlighting the skills gained and their relevance to POs and PSOs.

Table No.2.3.1: Summary of Student Internship, Skill Development and PO-PSO Mapping

Company Name	Students Benefitted	Duration	Company Domain	Skill Gained	Relevance to POs and PSOs
BEST - Bajaj Engineering Skills Training by Symbiosis Institute of Technology, Pune	58	6 Months	Smart manufacturing, IoT, AI/ML, Battery Technology, Robotics and Automation, Industry 4.0	Engineering and technical skills in smart manufacturing, IoT/AI applications, battery technology, and Industry 4.0 practices	PO1, PO3, PO5, PO9, PSO1, PSO2
Anantam Aerials and Robotics, Pune	2	6 Months	Aviation and Aerospace Component Manufacturing	Hands-on experience in aerospace components, robotics integration, and precision manufacturing	PO1, PO2, PO5, PO10, PSO1, PSO2
Endurance Technologies Ltd., Chh. Sambhaji Nagar	1	6 Months	Aluminums Die Casting, Suspension, Transmission, Braking Systems	Practical knowledge in automotive component manufacturing, casting, suspension systems, transmission, and braking systems	PO1, PO2, PO6, PO7, PSO1, PSO2
Interface Design Associates Pvt. Ltd., Sinnar, Nashik	1	6 Months	Advanced Mechatronics and Automation Solutions	Skills in CNC controllers, motion controllers, servo drives, industrial automation, and software for laser, plasma, wood routers, and mining equipment	PO1, PO2, PO9, PO10, PSO1, PSO2

Company Name	Students Benefitted	Duration	Company Domain	Skill Gained	Relevance to POs and PSOs
Kirloskar Pneumatic Company Limited, Hadapsar, Pune	1	6 Months	Air Conditioning & Refrigeration, Air Compressors, Process Gas Systems, Transmission, Forging & Fabrication	Practical understanding of industrial systems including AC/refrigeration, compressors, process gas handling, transmission systems, and forging/fabrication	PO1, PO3, PO5, PO7, PSO1, PSO2
Solid Vision, Goregaon (W), Mumbai	5	6 Months	3D Scanning Technology, 3D Printing, Engineering Design, Reverse Engineering, Manufacturing	Skills in 3D scanning, printing, reverse engineering, and advanced engineering design	PO1, PO2, PO6, PO7, PSO1, PSO2
Tata Motors, Pune	1	6 Months	Automobile Manufacturing	Understanding of manufacturing operations, quality control, industrial safety practices, and production workflow	PO1, PO3, PO5, PO6, PSO1, PSO2
360 Realtors	8	6 Months	Real Estate Consultancy, Property Management, Digital Marketing, Customer Relationship Management	Communication skills, client handling, market analysis, negotiation skills, use of digital tools for marketing and CRM	PO6, PO7, PO8, PO9, PO10, PSO1, PSO2
Clover Infotech Ltd	4	6 Months	IT Services, Cloud Computing, Data Center Solutions, Software Development	Technical skills in cloud platforms, networking fundamentals, software tools, problem-solving, and professional work practices	PO1, PO2, PO3, PO5, PO9, PO10, PSO1, PSO2
Hitachi Astemo, Ltd.	3	6 Months	Automotive Systems, Powertrain, Advanced Driver Assistance Systems (ADAS), Electric Mobility, Chassis and Suspension Systems	Basics of EV technologies, system integration, quality and safety standards, problem-solving, teamwork, and use of modern engineering tools	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PSO1, PSO2

Company Name	Students Benefitted	Duration	Company Domain	Skill Gained	Relevance to POs and PSOs
Mungi Engineers Pvt. Ltd.	32	6 Months	Precision Manufacturing, Tooling Solutions, CNC Machining, Industrial Components	Hands-on skills in CNC operations, production planning, quality control, measurement techniques. Drawings, and workplace safety practices	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PSO1, PSO2
Spinta Solutions	5	6 Months	Engineering Solutions, Automation, Embedded Systems, IoT Applications, Product Design	Skills in problem analysis, basic automation concepts, use of modern engineering tools, teamwork, and professional communication	PO1, PO2, PO3, PO5, PO9, PO10, PSO1, PSO2
Veda Engineering Pvt. Ltd.	4	6 Months	Mechanical Design, Manufacturing Solutions, Industrial Engineering	CAD modeling, drafting, understanding manufacturing processes, problem-solving, teamwork, use of modern engineering tools	PO1, PO2, PO3, PO5, PO9, PO10, PSO1, PSO2
ZF India Steering Gear Ltd.	3	6 Months	Automotive Systems, Steering Systems, Manufacturing, Quality Engineering	Exposure to automotive components, quality tools, safety standards, teamwork, and industry discipline	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PSO1, PSO2
Ambtronics Engineering Pvt. Ltd., Mumbai	2	6 Months	Industrial Electronics, Sensors, Automation Solutions	Basics of sensors, industrial instrumentation, troubleshooting, documentation, teamwork	PO1, PO2, PO3, PO5, PO9, PO10, PSO1
Axis Tooling	1	6 Months	Tool Design, Dies & Moulds, Precision Manufacturing	Tool design concepts, CAD usage, machining processes, inspection methods	PO1, PO2, PO3, PO5, PO9, PSO1, PSO2
Belrise Industries Limited	1	6 Months	Automotive Components, Sheet Metal, Welding, Manufacturing	Exposure to automotive production, quality tools, lean practices, safety and discipline	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PSO1, PSO2
CapitalVia	1	6 Months	Financial Services, Market Research, Digital Platforms	Analytical thinking, communication, data interpretation, professional ethics	PO6, PO7, PO8, PO9, PO10, PSO2

Company Name	Students Benefitted	Duration	Company Domain	Skill Gained	Relevance to POs and PSOs
DAMCO Engineering India Pvt. Ltd.	2	6 Months	Engineering Services, CAD/CAE, Product Design	CAD tools, design methodology, problem-solving, documentation practices	PO1, PO2, PO3, PO5, PO9, PO10, PSO1, PSO2
DESSAN Textfab Pvt. Ltd.	3	6 Months	Textile Machinery, Fabrication, Industrial Production	Understanding of production systems, basic maintenance, shop-floor practices	PO1, PO2, PO3, PO9, PO10, PSO1
FinoFy Technologies	1	6 Months	FinTech, Digital Applications, Software Platforms	Logical thinking, application usage, client interaction, documentation	PO2, PO3, PO5, PO9, PO10, PSO2
Force Motors	1	6 Months	Automobile Manufacturing, Engines, Assembly Systems	Knowledge of automotive processes, quality systems, safety standards, teamwork	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PSO1, PSO2
GARTECH Equipment's	1	6 Months	Material Handling Systems, Industrial Equipment	Mechanical assembly, reading drawings, maintenance practices, problem-solving	PO1, PO2, PO3, PO5, PO9, PSO1
MSS India, Nashik	1	6 Months	Automotive Components, Machining, Quality Engineering	CNC exposure, quality tools, process understanding, teamwork	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PSO1, PSO2
Supreme	2	6 Months	Plastics Manufacturing, Polymer Products, Industrial Production	Understanding manufacturing processes, quality inspection, safety practices	PO1, PO2, PO3, PO9, PO10, PSO1
YSP Infotech	1	6 Months	IT Services, Software Development, Web Solutions	Programming basics, debugging, logical thinking, teamwork, communication	PO1, PO2, PO3, PO5, PO9, PO10, PSO2

C. Feedback:

A systematic mechanism is implemented to monitor and evaluate student learning outcomes during industrial training. We record weekly progress and learnings through a Weekly Log Record, and ensure discipline and internship duration compliance through an Attendance Sheet. The Industry Supervisor Evaluation Form provides an objective assessment of professional conduct, technical skills, communication, and work performance. Further, the Student Feedback Form captures reflections on skill development, practical application of theory, and career readiness, supporting continuous improvement and outcome as shown in Table 2.3.2.

Table No.2.3.2: Industrial Training Monitoring and Outcome Assessment Mechanism

Document Used	Nature of Data Collected	Parameters Analyzed	Method of Analysis	Outcome
Weekly Log Record	Weekly tasks, activities performed, key learning's,	Level of learning, practical exposure, skill development	Compare tasks assigned vs. tasks completed and learning outcomes achieved	Measures attainment of practical and technical skills
Attendance Sheet	Daily presence, holidays, absences	Regularity, discipline,	Calculate attendance percentage and identify irregular students	Ensures compliance with internship duration and participation
Supervisor Evaluation Form	Ratings on dependability, teamwork, initiative, technical skills, communication, professionalism	Work performance, employability skills	Convert ratings into scores and classify performance (Excellent/Good/Satisfactory/Needs Improvement)	Used to judge professional competency and industry readiness
Student Feedback Form	Self-assessment on skills, learning, career relevance, satisfaction	Student perception of learning and relevance to curriculum	Analyze responses to identify strengths, weaknesses, and improvement areas	Supports continuous improvement and curriculum relevance
Overall Internship Record	Diary, attendance, evaluation, feedback	Overall effectiveness of internship	Correlate supervisor ratings with attendance and student feedback	Helps validate internship outcomes and quality assurance

To enhance experiential learning and practical application of theoretical concepts, semester projects are introduced in semesters III, IV, and V. These projects strengthen students' technical skills, problem-solving ability, teamwork, and presentation skills, while fostering design thinking and implementation capabilities. Each project concludes with a semester project report submitted as part of the requirements, following a standardized departmental format to ensure academic rigor and uniformity.

A. Identification of Projects and Guide Allocation

The project development process at the Institute follows the OBE framework and is implemented in the same structured manner as the capstone project.

The Head of the Department appoints a Project Coordinator to oversee planning, execution, and monitoring. Students form project groups and submit multiple project proposals with brief abstracts, which are evaluated based on relevance, innovation, technical depth, and feasibility. Approved topics proceed for implementation, while others are refined and resubmitted.

B. Process for Monitoring & Evaluation

Weekly meetings are conducted between project groups and their respective guides during scheduled project hours to review progress and ensure systematic documentation through a Project Log Book maintained from project initiation to completion.

In addition, the department organizes three formal project monitoring sessions evaluated by a faculty panel appointed by the Head of the Department.

Table No.2.4.1: Internal Continuous Assessment of Semester Project-I, II and III

Attendance	Logbook Maintenance	Literature survey	Depth of Understanding	Report	Total
05	05	05	05	05	25

Each project is evaluated according to its quality and the work done regularly. Table 2.4.1 shows rubrics for CA for all semester projects.

- Reviews cover key stages such as problem definition, literature survey, requirement analysis, design, and feasibility.
- Each group submits a Project Completion Report at the end of the semester in the prescribed format, verified by the project guide.
- CA is carried out by the Departmental panel, including the project guide, based on defined rubrics and outcome attainment.
- The working prototype demonstration, report, and final viva are evaluated by the guide and panel of examiners using a structured project grading sheet as shown in Table 2.4.2.

Table No.2.4.2: ESE Evaluation of Semester Project- I, II and III

Project Stage – I Selection	Design / Simulation / Logic	Hardware / Programming	Result verification	Presentation	Total
5	5	5	5	5	25

C. Domain-wise Categorization of Semester Project

All semester projects in Mechanical Engineering are an essential component of Outcome-Based Education (OBE), enabling students to apply core mechanical engineering fundamentals such as thermodynamics, design, manufacturing, and fluid mechanics (PO1) while performing systematic problem identification and requirement analysis for real-world applications (PO2). Through structured project work, students develop competencies in mechanical system design, component modeling, assembly development, and engineering drawings (PO3), along with hands-on experience in fabrication, experimentation, testing, validation, and troubleshooting (PO4). The effective use of modern engineering tools such as AutoCAD, SolidWorks, CATIA, ANSYS, MATLAB, Python, and simulation software strengthens technical proficiency (PO5). Projects also emphasize sustainability, energy efficiency, renewable systems, and environmentally responsible manufacturing practices (PO6, PO7), while promoting adherence to safety standards and professional ethics (PO8). Team-based project execution enhances collaboration and leadership skills (PO9), and comprehensive documentation, report writing, and presentations improve communication abilities (PO10).

The following Table 2.4.3, Table 2.4.4 & Table 2.4.5 represents year-wise distribution of Semester Project-I, II and III respectively.

Table No.2.4.3: Domain-wise Categorization of Semester Project-I and POs-PSOs Mapping

Sr. No.	Project Areas	No. of Semester Project-I			Mapping with POs	Mapping with PSOs
		25-26	24-25	23-24		
1	Materials & Manufacturing Processes	2	2	2	PO1 to PO12	PSO 1, PSO 2
2	Renewable Energy Systems	2	2	1	PO1 to PO12	PSO 1, PSO 2

Sr. No.	Project Areas	No. of Semester Project-I			Mapping with POs	Mapping with PSOs
		25-26	24-25	23-24		
3	Robotics, Control & Automation	3	1	6	PO1 to PO12	PSO 1, PSO 2
4	Automotive Engineering	2	2	0	PO1 to PO12	PSO 1, PSO 2
5	AI & IoT Integrated Systems	3	5	7	PO1 to PO12	PSO 1, PSO 2
6	Design and Analysis	3	0	0	PO1 to PO12	PSO 1, PSO 2
7	Thermal Engineering & Energy Systems	0	1	1	PO1 to PO12	PSO 1, PSO 2
Total		15	13	17		

Table No.2.4.4: Domain-wise Categorization of Semester Project-II and PO-PSO Mapping

Sr. No.	Project Areas	No. of Semester Project-II			Mapping with POs	Mapping with PSOs
		24-25	23-24	22-23		
1	Materials & Manufacturing Processes	2	5	3	PO1 to PO12	PSO 1, PSO 2
2	Design and Analysis	3	1	1	PO1 to PO12	PSO 1, PSO 2
3	Thermal Engineering & Energy Systems	0	0	2	PO1 to PO12	PSO 1, PSO 2
4	Renewable Energy Systems	1	2	0	PO1 to PO12	PSO 1, PSO 2
5	AI & IoT Integrated Systems	5	6	3	PO1 to PO12	PSO 1, PSO 2
6	Robotics, Control & Automation	2	0	2	PO1 to PO12	PSO 1, PSO 2
7	Automotive Engineering	0	2	0	PO1 to PO12	PSO 1, PSO 2
Total		13	16	11		

Table No.2.4.5: Domain-wise Categorization of Semester Project-III and PO-PSO Mapping

Sr. No.	Project Areas	No. of Semester Project-III			Mapping with POs	Mapping with PSOs
		25-26	24-25	23-24		
1	Materials & Manufacturing Processes	1	5	4	PO1 to PO12	PSO 1, PSO 2
2	Design and Analysis	4	0	1	PO1 to PO12	PSO 1, PSO 2
3	Thermal Engineering & Energy Systems	1	0	1	PO1 to PO12	PSO 1, PSO 2

Sr. No.	Project Areas	No. of Semester Project-III			Mapping with POs	Mapping with PSOs
		25-26	24-25	23-24		
4	Renewable Energy Systems	1	0	1	PO1 to PO12	PSO 1, PSO 2
5	AI & IoT Integrated Systems	4	6	3	PO1 to PO12	PSO 1, PSO 2
6	Robotics, Control & Automation	0	1	0	PO1 to PO12	PSO 1, PSO 2
7	Automotive Engineering	1	1	0	PO1 to PO12	PSO 1, PSO 2
Total		12	13	10		

Through these experiences, students strengthen PSO-1, reinforcing programming, algorithmic, and software design fundamentals, and PSO-2, enhancing competencies in web, mobile, database, and cloud-based application development. Overall, semester projects ensure comprehensive PO-PSO attainment, practical competence, and readiness for higher-level projects or professional challenges.

The projects across various domains aim to give students hands-on experience in solving real-world problems using modern engineering tools and technologies. Through these projects, students use their basic engineering knowledge, problem-solving skills, and design ideas, which helps them achieve important learning goals, leading to the attainment of relevant POs and PSOs. Taking into account safety, moral responsibility, environmental impact, and cost-effectiveness leads to socially responsible engineering solutions. Table 2.4.6 shows projects aligned with appropriate Sustainable Development Goals (SDGs), demonstrating their relevance to societal needs and sustainable development in line with the OBE.

Table No.2.4.6: Sample Semester projects- Domain-wise PO, PSO & SDG Mapping

Domain Name: Materials & Manufacturing Processes					
Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
Design and Fabrication of Foot Massage Machine	Prof. P D Jamadar	Safety, Ethics, Cost	Design & Fabrication	PO1 to PO12, PSO1, PSO2	SDG 3
Design & Fabrication of Fatigue Testing Machine	Prof. S. V. Yeole	Safety, Ethics, Cost	Design & Fabrication	PO1 to PO12, PSO1, PSO2	SDG 9
Design and Fabrication of Demo Prototype Voice-Controlled Smart Wheelchair	Prof. N M Shinde	Safety, Ethics, Cost	Product/ Fabrication	PO1 to PO12, PSO1, PSO2	SDG 8, SDG 9
Design and Development of a Soil Covering Attachment for Sapling Plantation Systems	Prof. R R Ozarkar	Environment, Safety, Cost	Fabrication	PO1 to PO12, PSO1, PSO2	SDG 2, SDG 8, SDG 9, SDG 12

Domain Name: Materials & Manufacturing Processes					
Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
Automatic Stamping Machine for Administration Work	Dr. B Y Patil	Safety, Ethics, Cost	Product/Fabrication	PO1 to PO12 PSO1, PSO2	SDG 11, SDG 9

Domain Name: Automotive Engineering					
Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
Automatic Engine Locking System	Dr. P S Patil	Safety, Ethics, Cost	Research/ Application	PO1 to PO12 PSO1, PSO2	SDG 3, SDG 9, SDG 11
Design and Modification of Electromagnetic Braking System for Free Wheel	Dr. K A Saner	Safety, Ethics, Cost	Fabrication	PO1 to PO12 PSO1, PSO2	SDG 3, SDG 9
Wheel-Drive Forklift for Industrial Warehouses	Prof. N M Shinde	Environment, Safety, Cost	Product/Fabrication	PO1 to PO12 PSO1, PSO2	SDG 8, SDG 9
Automatic Bike Stand Slider	Dr. P D Jamadar	Environment, Safety, Cost	Product/Fabrication	PO1 to PO12 PSO1, PSO2	SDG 3, SDG 9

Domain Name: Renewable Energy Systems					
Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
Municipal Solid Waste, Waste to Energy	Prof. Y R Pathak	Environment, Safety, Cost	Fabrication /Application	PO1 to PO12 PSO1, PSO2	SDG 9, SDG 16
Solar Based Mobile Charging Point	Prof. P D Jamadar	Environment, Safety, Cost	Application	PO1 to PO12 PSO1, PSO2	SDG 16

Domain Name: AI & IoT Integrated Systems					
Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
Finger Print Door Lock System Using Arduno	Prof. K A Saner	Environment, Safety, Cost	Application	PO1 to PO12 PSO1, PSO2	SDG 9, SDG 12
IOT Based Water level detector and Indicator	Prof. B Y Patil	Safety, Ethics, Cost	Product	PO1 to PO12 PSO1, PSO2	SDG 8, SDG 9
Identify Fatigue failure by Machine Learning Algorithm	Prof. R. R. Ozarkar	Cost	Application	PO1 to PO12 PSO1, PSO2	SDG 8, SDG 9
Arduino Based Prototype of Smart Parking System	Prof. M. R. Patil	Safety	Application	PO1 to PO12 PSO1, PSO2	SDG 9, SDG 12
Design Optimization of Helical Spring Washer by Using AI	Dr. H. K. Wagh	Cost	Product/ Application	PO1 to PO12 PSO1, PSO2	SDG 8, SDG 9
IoT Based Natural Ventilation System	Prof. M R Patil	Environment, Safety, Cost	Product/ Application	PO1 to PO12 PSO1, PSO2	SDG 16
Soil Moisture Based Intelligent Irrigation using IoT	Dr. P S Patil	Environment, Safety, Cost	Application	PO1 to PO12 PSO1, PSO2	SDG 9, SDG 16

Domain Name: Design and Analysis					
Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
Design and Development of a Soil Covering Attachment for Sapling Plantation Systems	Prof. R R Ozarkar	Environment, Ethics, Safety, Cost	Design & Development	PO1 to PO12, PSO1, PSO2	SDG 2, SDG 12

Domain Name: Design and Analysis					
Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
Design and Modification of Electromagnetic Braking System for Free Wheel	Dr. K A Saner	Environment, Ethics, Safety, Cost	Design & Development	PO1 to PO12, PSO1, PSO2	SDG 9, SDG 11
Design and Development of a Pickup Mechanism for Vegetable Sapling Plantation	Prof. S V Yeole	Environment, Ethics, Safety, Cost	Research	PO1 to PO12, PSO1, PSO2	SDG 2, SDG 12

Domain Name: Robotics, Control & Automation					
Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
Auto Plant Irrigation	Prof. P S Patil	Environment, Cost	Application	PO1 to PO12, PSO1, PSO2	SDG 3, SDG 9
Eco Friendly Road Cleaning Machine	Prof. R R Ozarkar	Environment, Safety, Cost	Fabrication	PO1 to PO12, PSO1, PSO2	SDG 3
Design and Development of a Pickup Mechanism for Vegetable Sapling Plantation	Prof. S V Yeole	Safety, Cost	Fabrication	PO1 to PO12, PSO1, PSO2	SDG 3, SDG 9
Development of a Precision Depth Control System for Automated Sapling Transplantation	Prof. S V Yeole	Safety, Cost	Application/Research	PO1 to PO12, PSO1, PSO2	SDG 3, SDG 9
Development of a Robotic Hold and Convey Mechanism for Sapling Plantation	Dr. B Y Patil	Safety, Cost	Product/Fabrication	PO1 to PO12, PSO1, PSO2	SDG 3

Domain Name: Robotics, Control & Automation					
Project Name	Guide Name	Key Factors (Environment / Safety / Ethics / Cost)	Type of Project	POs and PSOs Mapping	Mapping to SDG
Smart Navigation and Path-Finder Mechanism for Automated Vegetable Transplantation	Prof. R R Ozarkar	Safety, Cost	Application	PO1 to PO12 PSO1, PSO2	SDG 3, SDG 9

At the same time, these projects improve PSO-1 by using basic mechanical engineering ideas, problem-solving methods, and system design concepts, and they boost PSO-2 by developing skills in modeling, simulation, manufacturing processes, thermal-fluid systems, and automation tools, which helps students be better prepared for the industry and The student projects help achieve POs and PSOs by using engineering knowledge, analyzing problems, designing solutions, and applying modern mechanical engineering tools and techniques to solve real-world issues.

These projects help create a better future by encouraging energy-saving systems, smart manufacturing, efficient use of resources, safety in mechanical systems, and new technology, which supports important Sustainable Development Goals (SDGs) and prepares students for the industry while benefiting society.

D. Seminar / Presentation Activity

The Presentation Activity is a key component of continuous learning and assessment in the department. It is conducted for 2–3 subjects as a key component of teacher assessment; this activity aims to enhance students’ technical knowledge, communication skills, confidence, and professional presentation abilities.

Students are assigned topics from core subjects or interdisciplinary areas aligned with COs, POs, and PSOs. Students prepare a PowerPoint presentation through research and analysis of credible academic and industry sources, fostering self-learning and awareness of technological advancements.

Process for Conducting the Activity:

- Announcement of the activity in the academic calendar and notify students.
- Assign topics aligned with curriculum and program outcomes.
- Share evaluation rubric and marking criteria with students.
- Communicate dress code and presentation etiquette.
- Confirm panel members and schedule.
- Panel evaluates and records scores immediately after Q&A.
- Compute final marks as the average of panel scores.

Presentations are evaluated by a faculty panel using rubrics covering organization, clarity, delivery, visual aids, technical knowledge, and audience engagement. This activity not only reinforces engineering concepts but also develops critical soft skills such as teamwork, analytical thinking, and public speaking. Suggestions from panel members contribute to improvements in presentation skills.

Overall, the Presentation Activity bridges theoretical knowledge and practical application, preparing students for professional presentations, project defenses, and future academic or industry roles. The following Table 2.4.7 shows the rubrics for the presentation activity, while Table 2.4.8 highlights the course-wise presentation topics along with their corresponding POs and PSOs mapping.

Table No.2.4.7: Evaluation of Presentation Activity

Organization and content of Presentation	Clarity and Delivery	Use of Visual aids	Technical Knowledge	Engagement with Audience	Total
05	05	05	05	05	25
The total marks are then Scale down to 5					

Table No.2.4.8: Sample Mapping of Presentation Topics for A.Y. 2024-25

Presentation Topic	Course	PO's Mapping	PSO's Mapping
Additive Manufacturing Techniques	Manufacturing Processes	PO1, PO6, PO8, PO10	PSO1

Presentation Topic	Course	PO's Mapping	PSO's Mapping
Automation in Mechanical Systems	Robotics and Automation	PO3, PO6, PO7, PO10, PO11	PSO2
Renewable Energy Integration in Mechanical Design	Thermal Engineering & Energy Systems	PO3, PO5, PO6, PO10, PO11	PSO2
Smart Sensors and IoT in Mechanical Systems	AI & IoT Integrated Systems	PO1, PO5, PO10, PO12	PSO2
CAD/CAM Applications in Mechanical Design	Design and Analysis	PO1, PO2, PO5, PO10	PSO1
Thermal Analysis of Heat Exchangers	Thermal Engineering & Energy Systems	PO3, PO5, PO10, PO11, PO12	PSO2
Mechatronics in Industrial Automation	Robotics, Control & Automation	PO3, PO5, PO10, PO11, PO12	PSO2
Energy Efficiency Optimization in Manufacturing	Renewable Energy Systems	PO1, PO2, PO4, PO5, PO12	PSO1

2.5 Case Studies and Real-Life Examples (10)

Total Marks 10.00

Case studies and real-life examples support the OBE framework by effectively linking theoretical concepts with practical applications. They enhance students engineering knowledge, problem analysis, and solution design while promoting the use of modern engineering tools. Such activities foster critical thinking, ethical awareness, teamwork, communication, and project management skills.

Table 2.5.1 gives a full picture of the case studies for the Interdisciplinary Projects, Deployable Projects, and Universal Human Values (UHV) courses. These case studies show how technical education can be combined with ethical understanding and real-world applications in a systematic way. Table 2.5.1 captures sample activities implemented across academic years, covering diverse domains such as web and application development, agriculture technology, smart transportation, IoT, artificial intelligence, healthcare, sustainability, social harmony, and professional ethics. Each activity is explicitly mapped to relevant Program Outcomes (POs) and Course Outcomes (COs), demonstrating strong alignment with the Departments Outcome-Based Education (OBE) framework.

Table 2.5.1 reflects how curriculum-embedded projects and UHV case studies contribute to:

- PO & CO attainment: Strengthening engineering knowledge, problem-solving ability, ethical reasoning, teamwork, communication, and lifelong learning through both technical projects and value-based case studies.
- Industry and societal relevance: By addressing real-life challenges in agriculture, transportation, waste management, digital governance, healthcare monitoring, and community ethics, often involving realistic institutional or societal contexts.
- Ethical and human value development: UHV case studies through role plays, posters, debates, and reflections cultivate honesty, integrity, justice, compassion, environmental responsibility, and harmonious living.
- Hands-on learning and innovation: Students gain practical exposure to modern tools and technologies such as CAD/CAM software, CNC machining, automation and robotics, thermal and fluid systems, advanced manufacturing processes, mechatronics, and simulation techniques, along with the development of functional prototypes and industry-ready demonstrative models. Holistic education and social impact: The combined focus on interdisciplinary technical projects and UHV case studies ensures balanced development of technical competence, ethical awareness, and social responsibility.
- Sustainable Development Goals (SDGs): The projects and UHV case studies support SDG 3 (Good Health and Well-being), SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 16 (Peace, Justice and Strong Institutions) through technology-driven, sustainability-focused, and ethics-oriented learning initiatives.

Table No.2.5.1: Real-Life Examples Domain-wise Project Outcome and SDG Mapping

Sr No	Topic	Course Name & Code	PO Mapped	CO Mapped	Description of Case / Real life Example	Industry / Organization Involved	Application Area / Domain	Learning Outcome / Insight	Assessment Method Used	Reference / Source
1	Seed Sowing Machine	Interdisciplinary Project	PO1, PO2, PO3, PO4, PO5, PO7, O11	CO1, CO2, CO3, CO4	A Seed Sowing Machine is a device used to place seeds in the soil at proper depth and spacing to ensure uniform crop growth. It helps reduce manual effort, saves time, and improves agricultural productivity.	R. C. Patel Institute of Technology, Shirpur	Smart Agri-Tech	Mechanical design skills, Practical fabrication skills, Agricultural technology awareness	Demo, evaluation, report, presentation	Krishi Vigyan Kendra

Sr No	Topic	Course Name & Code	PO Mapped	CO Mapped	Description of Case / Real life Example	Industry / Organization Involved	Application Area / Domain	Learning Outcome / Insight	Assessment Method Used	Reference / Source
2	Smart Disposal Bin	Interdisciplinary Project	PO1, PO3, PO4, PO5, PO6, PO7, PO9	CO2, CO3, CO4	IoT-based waste management with automated collection alerts	R. C. Patel Institute of Technology, Shirpur	IoT, Automation, Smart Cities	IoT deployment, sustainability, teamwork	Demo, evaluation, report, presentation	Waste management studies, IoT manuals
3	Solar guard: Autonomous Bird and Animal Scarecrow System	Universal Human Values (HMCO4060T)	PO6, PO8	CO1, CO5	Role Play	R. C. Patel Institute of Technology, Shirpur	Professional Ethics	Importance of honesty and integrity in professional life.	Role Play	UHV Textbook, AICTE Ethics Module
4	Automated Teacher Attendance System Using Bluetooth Beacon	Universal Human Values (22MHCOM406T)	PO6, PO8	CO2	Ethical use of automation for transparency in academic processes	All Educational Institutions	Ethics in Technology	Students understand responsible use of technology	Poster presentation & viva	UHV Textbook, AICTE Ethics Module
5	Smart Dustbin: Intelligent Waste Management	Universal Human Values (22MHCOM406T)	PO6, PO7, PO10	CO2, CO5	Smart solutions for cleanliness and social responsibility	Municipal Corporation	Social Responsibility	Learners develop civic responsibility	Poster & Demonstration	Swachh Bharat Mission Resources
6	Solar Based Cold Water ATM	Universal Human Values (22MHCOM406T)	PO6, PO7	CO2, CO3	Providing affordable clean water sustainably	NGOs, Rural Development Bodies	Sustainability & Health	Awareness of sustainable solutions	Poster Presentation	Renewable Energy Journals
7	Fire Fighter Drone	Universal Human Values (RCP231CHSX04)	PO6, PO7, PO10	CO3, CO5	Use of technology for saving human lives	Disaster Management Authority	Social Service	Technology for humanitarian benefit	Demonstration & Viva	Disaster Management Journals
8	Solar Powered Motorized Scarecrow	Universal Human Values (RCP231CHSX04)	PO6, PO7, PO10	CO2, CO5	Eco-friendly crop protection supporting farmers	Agriculture Sector	Sustainability & Ethics	Respect for nature and farmer welfare	Demonstration	Agricultural Engineering Journals

The Department of Mechanical Engineering at R. C. Patel Institute of Technology, Shirpur, actively promotes SWAYAM, NPTEL, and other recognized MOOC certifications as an integral component of the academic ecosystem. The following Table 2.6.1 presents the module-wise skill development framework and its alignment with POs and PSOs. These certifications are encouraged not only for knowledge enhancement but also as an alternative mechanism for evaluating students term test performance as per institutional academic policies.

Table No.2.6.1: Curriculum Modules, Skills Acquired, and Mapping to POs and PSOs

Sr. No.	Name of the Module	Skill Gained	Relevance to PO's and PSO's
1	Optimization from fundamentals	The goal is to build strong analytical and problem-solving skills to formulate, analyze, and solve constrained and unconstrained optimization problems for improved engineering design and efficient resource utilization.	PO1-PO7, PO9, PO12; PSO1, PSO2
2	Principles of Industrial Engineering	The program enhances skills in productivity improvement, work study, process optimization, facility planning, quality control, and efficient resource management for industrial and manufacturing systems.	PO1, PO2, PO3, PO4, PO5, PO12; PSO1, PSO2

The following table, 2.6.2, shows the academic year-wise participation of UG students in SWAYAM/NPTEL/MOOC and other online certification courses. Participation increased steadily over the years, with a significant rise in AY 2024-25 due to systematic promotion of certifications and their acceptance as an option for evaluating term test performance.

Table No.2.6.2: Year wise Certification by Students

Academic Year	2022-23	2023-24	2024-25	2025-26
No. of Certifications	15	19	45	17

This initiative has strengthened self-learning, technical competency, and outcome attainment among students.

Scope for Self-Learning and Facilities and Its Use:

The Mechanical Engineering department provides a strong ecosystem to promote self-learning and continuous professional development among students.

Platforms such as CodeChef are actively used to enhance students problem-solving ability, programming skills, and algorithmic thinking through regular practice, contests, and peer learning, directly supporting analytical and computational competencies.

The Central Library with DELNET access offers extensive digital and print resources, including e-books, e-journals, research articles, theses, and conference proceedings, enabling students to engage in independent learning, literature surveys, and research-oriented activities.

Additionally, the ACM Student Chapter facilitates self-learning through technical talks, workshops, coding events, webinars, and professional networking, exposing students to emerging technologies and best industry practices. Collectively, these facilities effectively support OBE and foster lifelong learning.

The Virtual Laboratory (VLAB) facilities strengthen the scope of self-learning beyond regular classroom and laboratory hours. Virtual labs allow students to independently perform simulated experiments, visualize complex concepts, and practice laboratory procedures at their pace, thereby reinforcing theoretical understanding through hands-on learning. The effective use of this facility enhances students' experimentation skills,

analytical and problem-solving abilities, and familiarity with modern engineering tools.

2.7 Solving Complex Engineering Problems Incorporating Sustainability Goals (20)

Total Marks 20.00

Solving complex engineering problems incorporating sustainability goals strongly supports the OBE framework by effectively connecting theoretical concepts with practical implementation. Such activities enhance engineering knowledge, problem analysis, solution design, and the use of modern engineering tools, while fostering critical thinking, ethical awareness, teamwork, communication, and project management skills. Overall, they strengthen PO and PSO attainment, improve industry readiness, and promote lifelong learning.

The department delivered industry-oriented 3D printing labs and workshop facilities available for 24*7. Student projects dealt with real-world uses in industry. These solutions improved automation accuracy, energy efficiency, connectivity, reliability and sustainability, while strengthening industry-institute collaboration and hands-on learning aligned with OBE.

The following Table 2.7.1 presents selected industry-driven problem scenarios, their engineering methodology, proposed solutions, societal impact, and assessment methods, demonstrating practical implementation and sustainable innovation.

Table No.2.7.1: Sample Projects for Solving Complex Engineering Problems Incorporating Sustainability Goals

Problem Title / Scenario	Course Name & Code	PO Mapped	SDG	Description of Problem	Engineering Approach / Methodology	Tools / Technologies Used	Solution Proposed	Impact on Society / Environment	Assessment Method
Ganapati Visarjan Nirmalya Cleaning Problem at River	Design and Fabrication	PO1-PO12, PSO1, PSO2	SDG 6 SDG 14	During Ganapati Visarjan, large quantities of Nirmalya (flowers, decorations, idols) are immersed in rivers, causing water pollution and environmental degradation.	Design and development of a mechanical river-cleaning system using a belt drive and conveyor mechanism to collect floating Nirmalya waste.	MS sheet cutting, welding processes, belt drive system, conveyor mechanism, basic fabrication tools	Fabrication of a river-cleaning mechanism that efficiently collects Nirmalya waste during immersion activities.	Reduces river pollution, improves water quality, protects aquatic life, and promotes eco-friendly festival practices.	Design evaluation, fabrication quality, working demonstration, report writing, and viva-voce
3D Modeling and Drafting of Special Fastener	Machine Design	PO1-PO12 PSO1 PSO2	SDG 9 SDG 12	Standard fasteners often fail to satisfy specific application requirements such as high load capacity, space limitations, special locking features, or corrosion resistance. Therefore, a customized special fastener must be designed using accurate 3D modeling. drawings as per engineering standards.	The process includes analyzing design requirements, selecting suitable materials, and creating a precise 3D model with detailed 2D drawings as per standards.	Fusion 360 ISO/BIS standards handbook	Development of a complete 3D model and detailed production drawing of a special fastener with proper dimensions, tolerances, and material specifications. The design ensures strength. effectiveness.	Promotes efficient design, reduces material waste, enhances product reliability, and supports sustainable manufacturing.	3D model accuracy evaluation, drafting standards compliance check, design calculations verification, project report submission.
3D Modeling and Drafting of Regular Fastener	Computer Aided Design and Manufacturing (CAD CAM)	PO1-PO5, PO10, PO12, PSO1	SDG 9 SDG 12	Regular fasteners such as bolts, nuts, and screws are widely used in mechanical assemblies. The problem involves creating accurate 3D models and detailed 2D drafting of a standard fastener as per ISO/BIS standards for proper manufacturing and assembly.	Study of standard dimensions and specifications, 3D parametric modeling of the fastener, preparation of detailed 2D drawings with tolerances, threads, and surface finish as per standards.	Fusion 360 ISO/BIS standards handbook.	Development of a precise 3D model and production drawing of a regular fastener ensuring dimensional accuracy and standard compliance	Improves manufacturing accuracy, ensures interchangeability of components, reduces errors and material wastage.	Model accuracy check, drafting standard verification, practical demonstration, report submission, and viva-voce.

The department has taken consistent efforts to strengthen industry-institute interaction by bridging academic learning with real-world industrial practices. Collaborations with industries, start-ups, and professional bodies provide students with opportunities for internships, industry-oriented projects, expert lectures, and hands-on training. These initiatives shown in Table 2.8.1 help students gain practical exposure to emerging technologies, enhance technical and professional skills, and improve employability, while enabling faculty to align teaching-learning processes with current industry requirements.

A. Industry-Led Technical Training and Visits

The Mechanical Engineering Department has established active Memoranda of Understanding (MoUs) with reputed industries, training organizations, and CSR partners to strengthen industry-academia interaction. MoUs strengthen outcome-based education by enabling industry-relevant technical training, internships, live projects, expert interactions, and placement-focused skill development for students.

Table No.2.8.1: MoU-Supported Industry Interaction and Training Programs

Name of the Industry	MOU for	Activities Conducted
Case Point Private Limited	<ul style="list-style-type: none"> • Collaboration for training students in relevant technologies • Providing skill-based training, workshops, assessments • Recruitment support based on company requirements • Confidentiality, IP protection, termination clauses included. 	<ul style="list-style-type: none"> • Technical & skill-based training for students. • Periodic assessments and assignments. • Recruitment/interview process for shortlisted candidates
E-Samyak Software Pvt. Ltd	<ul style="list-style-type: none"> • Collaboration for training students in relevant technologies • Providing skill-based training, workshops, assessments • Recruitment support based on company requirements • Confidentiality, IP protection, termination clauses included. 	<ul style="list-style-type: none"> • Technical & skill-based training for students. • Periodic assessments and assignments. • Recruitment/interview process for shortlisted candidates.

Name of the Industry	MOU for	Activities Conducted
Shalaka Pvt Ltd	<ul style="list-style-type: none"> • Industrial training for students & faculty • Guest lectures from industry experts • Internships for TE and BE students • Participation in technical events, workshops, symposiums • Internship, Remote Assignment, Campus Placement Program, Expert Talk, Participation in Syllabus Revision, Workshop for students & faculty 	<ul style="list-style-type: none"> • Expert sessions & workshops on emerging tech • Live project execution & mentoring • Summer/Winter internship programs • Technical events participation • Career guidance and placement support.
Code Quotient Pvt. Ltd.	<ul style="list-style-type: none"> • Access to Code Quotient Platform /courses online to all the students& teacher of the partner. • Online/On-Campus Training • Industrial training (Summer/Winter) to selected students • Internship/Jobs to the selected students 	<ul style="list-style-type: none"> • Enabled continuous learning and self-paced skill development through curated programming courses. • Conducted expert-led training sessions both online and on-campus covering key programming languages, software development practices, and emerging technologies.

Name of the Industry	MOU for	Activities Conducted
Campus Credential	<ul style="list-style-type: none"> • Aptitude & Technical Training • Pre-placement expert lectures (seminars/webinars) • Career guidance sessions. • Training students for placement. • Employability skills enhancement 	<ul style="list-style-type: none"> • Aptitude Training Program and Assessment • Technical Placement Training and Assessment • Webinars/Seminars by experts. • Career Guidance Workshops. • LMS for placement preparation • Assessment of students for company
Code Quotient Private Limited	<ul style="list-style-type: none"> • Access to Code Quotient Platform /courses online to all the students& teacher of the partner. • Online/On-Campus Training • Industrial training (Summer/Winter) to selected students • Internship/Jobs to the selected students 	<ul style="list-style-type: none"> • Enabled continuous learning and self-paced skill development through curated programming courses. • Conducted expert-led training sessions both online and on-campus covering key programming languages, software development practices, and emerging technologies.

Name of the Industry	MOU for	Activities Conducted
RPG Foundation	<ul style="list-style-type: none"> • Employability Skills Development under CSR initiative • Technical, soft skills & domain-based training. • Real-time case study-based training (Cloud, DevOps, Robotics, Agile, etc.). • Provide trainers, assessments & course content. • RCPIT provides infrastructure, staff, and batch coordination. • MoU renewed yearly (confirmed for AY 2023–24). 	<ul style="list-style-type: none"> • Employability Training (Technical + Soft Skills). • Cloud Computing, Agile, DevOps Modules. • Industry Case-Based Training. • Student Assessments. • Continuous feedback & progress review.
Centum Foundation	<ul style="list-style-type: none"> • Orientation, screening & enrolment of students • Training in hybrid mode (300 hrs. total —online & offline) • Creating LMS, assessments, assignments, training reports. • Improving employability skills of beneficiaries. • Confidentiality, IP rights, compliance with law, liability, termination terms • RCPIT to provide training venue, mobilization, trainer support, attendance records, safe environment. 	<ul style="list-style-type: none"> • Students' orientation & screening • Online/offline skill development training • LMS-based assessments & progress tracking • Placement support for trained beneficiaries • Regular reporting, batch formation, trainer scheduling • Certificates issued after successful completion of Training

Name of the Industry	MOU for	Activities Conducted
R3 Systems India Private Limited	<ul style="list-style-type: none"> • Classroom-based technical training • Workshops, technical sessions, industry-oriented module • Continuous assessment & feedback • Expert sessions and guidance for employability • Joint review committee activities 	<ul style="list-style-type: none"> • Classroom-based technical training • Workshops, technical sessions, industry-oriented modules • Continuous assessment & feedback • Expert sessions and guidance for employability • Joint review committee activities • Internship & Placement Opportunities • Mock Interviews/Resume Preparations for final year students
Infosys Limited (Springboard)	<ul style="list-style-type: none"> • Access to Infosys Springboard digital learning platform • CSR-based training initiative for students & faculty • FDPs on pedagogy, instructional design & emerging technologies • Virtual classrooms, proctored assessments, microsite creation • Non-commercial academic use only • 5-year validity, confidentiality & data privacy agreements. 	<ul style="list-style-type: none"> • Expert sessions & workshops on emerging tech • Live project execution & mentoring • Summer/Winter internship program • Technical events participation • Career guidance and placement support.

Name of the Industry	MOU for	Activities Conducted
CodeChef	<ul style="list-style-type: none"> • Periodic practice sessions & Assessment-based tests (for grading) shall be created by CodeChef for the students and shared regularly with the College. • Monthly report shall be sent to the College about the students' overall performance on CodeChef. 	<ul style="list-style-type: none"> • CodeChef created and shared regular practice sessions and assessment-based coding tests with the college students. • These were designed to challenge students' problem-solving and coding skills periodically and provide a structured learning path.
Effective German Academy	<ul style="list-style-type: none"> • Conduct German Language Training for RCPIT students. • Prepare students for ALTE German Proficiency Test. • Training schedule: 16 weeks / 180+ Hrs • RCPIT to provide classroom availability, holiday calendar, and admin support • One-time study material provides • Webinar for awareness of German Language 	<ul style="list-style-type: none"> • Conducting German Language A1 and A2 classes • Preparation for A1 and A2 proficiency exam. • Regular assessments during training. • Opportunities for internships, advanced training, and German related career guidance
Yen Academy	<ul style="list-style-type: none"> • Conduct Japanese Language Training for JLPT N5 and N • Prepare RCPIT students for JLPT N5 and N4 Exam • Training duration: 16 weeks / 150+ hrs • RCPIT to provide class schedule, holiday calendar, admin support • One-time study material provided • Webinar for awareness of Japanese Language 	<ul style="list-style-type: none"> • Japanese Language N5 and N4 Classes. • JLPT N5 and N4 exam preparation sessions. • Continuous assessments and study material distribution. • Opportunities for internships, advanced training, and Japan related career guidance

Name of the Industry	MOU for	Activities Conducted
Admission Labs Germany	<ul style="list-style-type: none"> Guiding and assisting students interested in pursuing Higher education in Germany. On boarding and free profile evaluation Documentation and application support Assisting VISA documentation etc. 	<ul style="list-style-type: none"> Webinar for parents on Financial Assistance for Overseas Education – Organized by Admission Labs, Germany Online session on Alumni Insights and Success Stories -by Admission Labs, Germany
Powerhouse Global Services	<ul style="list-style-type: none"> To Promote internationalization, academic exchange To establish strategic partnership to deliver TNE program. 	<ul style="list-style-type: none"> Session by COO Mr. Krishna Patil in Converges'25 World Education Fair at Services
Konark Global Pvt Ltd	<ul style="list-style-type: none"> Internship, Remote Assignment, Campus Placement Program, Expert Talk, Participation in Syllabus Revision, Workshop for students & faculty 	<ul style="list-style-type: none"> Employability Training Exposure to Industrial Safety Practices & Compliance Standards Introduction to Project Execution & Site Engineering Practices

Through these collaborations, students gain hands-on exposure, problem-solving ability, professional skills, and familiarity with modern tools and technologies, leading to improved attainment of POs and PSOs. The following Table 2.8.2 represents the industry collaborations along with their impact analysis and mapping with relevant POs and PSOs.

Table No.2.8.2: Industry Engagements, Outcome Impact, and POs/PSOs Alignment

Industry Name	Impact Analysis	Mapped POs / PSOs
Case Point Pvt. Ltd	The MoU improved technical competence and job readiness through skill-based training.	PO2, PO5, PO11
E-Samyak Software Pvt. Ltd	The MoU strengthened programming proficiency and analytical thinking.	PO1, PO2, PO5, PO12

Shalaka Pvt Ltd	The MoU facilitated experiential learning outcomes through structured internships and live industry projects, enhancing practical competencies	PO3, PO5, PO9, PSO2
Code Quotient Pvt. Ltd	The MoU enabled continuous learning and coding skill development through online platforms.	PO1, PO5, PO12
Sunrise Mentors Pvt. Ltd (Coding Ninjas)	The MoU enhanced coding ability and placement preparedness.	PO2, PO5, PO11
Sorting Hat Technologies Pvt. Ltd (Code Chef)	The MoU improved problem-solving and competitive programming skills through regular assessments.	PO2, PO5, PO12
Campus Credential	The MoU strengthened aptitude, technical skills, and employability.	PO1, PO5, PO10
RPG Foundation	The MoU enhanced employability through industry-relevant technical and soft skill training.	PO6, PO8, PO10, PO12
Centum Foundation	The MoU improved skill development, assessment-based learning, and placement support.	PO5, PO7, PO10
R3 Systems India Pvt. Ltd	The MoU strengthened industry-oriented technical skills and career readiness.	PO1, PO2, PO5, PO9
Infosys Ltd (Springboard)	The MoU promoted digital skills, faculty up skilling, and lifelong learning.	PO5, PO12, PSO
Effective German Academy	The MoU improved global employability through foreign language proficiency.	PO8, PO10, PO12
Yen Academy	The MoU developed Japanese language skills for international career opportunities.	PO8, PO10, PO12

Admission Labs Germany	The MoU facilitated opportunities for higher education abroad through structured guidance.	PO8, PO10
Powerhouse Global Services	The MoU strengthened international exposure and global academic collaboration.	PO8, PO10
Konark Global Pvt Ltd	The MoU strengthened to exposure Cloud Computing, Agile and DevOps practices, industry case-based learning, continuous assessment, and performance feedback,	PO2, PO5, PO9, PO10, PO12, PSO1, PSO2

B. Industrial Guest Lectures

The Mechanical Engineering Department organized a series of expert lectures, national-level webinars, and MIC-driven innovation and IPR activities to enhance students' awareness of innovation, entrepreneurship, intellectual property rights, societal responsibilities, and global career opportunities. These activities bridge the gap between academic learning and real-world practices, thereby improving the attainment of POs and PSOs. Table 2.8.3 represents the impact of expert lectures and resource person sessions on POs-PSOs attainment.

Table No.2.8.3: Impact of Expert Lectures and Resource Person Sessions on PO-PSO Attainment

Resource Person with Designation	Title/Topic Addressed	Date	Number of students Participated	Gaps Addressed	Impact Analysis (PO & PSOs)
Mr Baliram Bondge Project Manager	Brief about Symbiosis Skill Training Courses	06-01-2026	174	Gap in awareness of skill-based training programs, certification pathways, and industry-oriented learning opportunities	PO12, PSO2
Mr. Suraj Sharma Director of Operations	Preparation Roadmap for Better Placement/Internship	15-12-2025	160	Gap in structured preparation strategy for placements, internships, and career planning	PO10, PSO2
Dr. Pradeep Waychal, Dr. Sharad Deogekar Chairperson, Vice President at IRS	Infosys and Carrier Guidance	26-11-2025	200	Gap in career awareness, industry expectations, and professional growth planning	PO10, PO12, PSO2
Shaurya Gaikwad Founder and CEO at LEAP	My Story / Building Before Graduation: AI, Startups & Practical Entrepreneurship	22-11-2025	2000+	Gap between theoretical learning and practical entrepreneurship Lack of awareness of AI-driven startup building tools	PO5, PO11, PO12, PSO1

Resource Person with Designation	Title/Topic Addressed	Date	Number of students Participated	Gaps Addressed	Impact Analysis (PO & PSOs)
Ms. Kiran Akapasu, Psychologist, NMIMS Shirpur	World Mental Health Day Session – “Mental Health in Catastrophes and Emergencies”	10-10-2025	120	The session addressed the gap between academic curriculum and students’ emotional and psychological preparedness to handle stress, anxiety, and mental health challenges during emergencies and high-pressure academic environments.	PO8, PO12, PSO2
Dr. Hemraj Kumavat Assistant Professor & IPR Expert	National Level Webinar on IPR Awareness: From Innovation to Patent Filing	29-08-2025	800+	Limited understanding of IPR and patent filing processes, understanding innovation-to-startup pipeline and TRL levels	PO4, PO5, PO12, PSO1
Dr. Santosh Rane Dean, Sardar Patel COE Mumbai	National-level Webinar on “Lean Start Up Ecosystem”	21-08-2025	489	Lack of awareness on lean startup methodology	PO3, PO5, PO10, PSO1
Yogesh Potdar, et.al.	Company Recruitment Process	16-05-2025	86	Gap in understanding corporate recruitment processes, interview expectations, and hiring criteria	PO10, PSO2
K. B. Rajendra, Avinash Mishra, lakshay Vaidya Finance Procurement and administration, Development and Industry collaboration, Management Intern	AR / VR development Training programme	16-04-2025	83	Gap in exposure to emerging technologies such as AR/VR and their industrial applications	PO5, PSO1
Dr. Dara Ajay Head – Technology Transfer Office, Intellectual Property Management Cell, IIT Madras [MIC Driven]	Patent to Product (सृजना से समृद्धि)	26-04-2025	100+	Gap in understanding patent analytics, FTO, market research, and partner identification	PO3, PO5, PO11, PSO1

Resource Person with Designation	Title/Topic Addressed	Date	Number of students Participated	Gaps Addressed	Impact Analysis (PO & PSOs)
Mr. Jai Veer Assistant Controller of Patents & Designs, DPIIT, Ministry of Commerce & Industry [MIC Driven]	Commercialization of Patents & Government Support Systems	26-04- 2025	100+	Lack of understanding of IP office processes and decision- making, Need for awareness of NIPAM schemes & government support	PO5, PO12, PSO1
Dr. Sripathi Rao Kulkarni Senior Principal Scientist, CSIR Innovation Complex – Mumbai [MIC Driven]	Session on "Significance of IP Protection and Commercialization "	25-04- 2025	100+	Limited understanding of economic & strategic benefits of IP protection	PO5, PO11, PSO1
Dr. Rahul Taneja Scientist B, Haryana State Council.	Mark the Spot: Trademarks Talk	24-04- 2025	100+	Limited understanding of trademarks and GIs and their role in branding & identity, need to learn how trademarks & GIs create economic value	PO7, PO12, PSO2
Dr. Hemant Khosla Sr. Examiner... DPIIT	Copyright Protection Mechanisms & Case Studies	23-04- 2025	100+	Lack of exposure to official copyright registration & prosecution procedures	PO8, PO12, PSO2
Ms. Anooja Padhee Partner, K&S Partners	Copy That! Copyrights Uncovered	23-04- 2025	100+	Limited knowledge of copyright and its importance, gap in awareness of enforcement mechanisms	PO8, PO12, PSO2
Dr. Chakravarthy Professor & Dean, Mahindra University	Importance of Design Protection	22-04- 2025	100+	Lack of exposure to real-life examples • Need for awareness of design impact, Gap in understanding design rights contribution	PO3, PO5, PSO1
Prof. Gauri Gargate Faculty IIT Kharagpur	Discover More with Design Registrations	22-04- 2025	100+	Limited understanding of design registration, gap in commercialization knowledge	PO3, PO5, PSO1

Resource Person with Designation	Title/Topic Addressed	Date	Number of students Participated	Gaps Addressed	Impact Analysis (PO & PSOs)
Prof. (Dr.) Unnat P. Pandit Controller General DPIIT	IP Awareness	21-04-2025	100+	Lack of awareness of patent processes. Gap in connecting innovation and IP	PO5, PO7, PSO1
Dr. Sacha Wunsch-Vincent WIPO	IP UTSAV	21-04-2025	100+	Limited understanding of global IP systems gap in global innovation knowledge	PO7, PO12, PSO2
Shri. Krishna Patil Director	Innovation & Entrepreneurship	28-02-2025	500+	Lack of entrepreneurial exposure among students	PO11, PO12, PSO2
Shri. Manish Mehra Program Manager TCS	Emerging Trends in Software Industry	27-02-2025 to 28-02-2025	100+	Industry exposure gap and practical understanding of real-world software practices	PO5, PO12, PSO1
Mr. Subham Sughandi Founder – Marketing Mantra TEDx Speaker	Expert Lecture on National Startup Day	16-01-2025	80	Limited awareness of startup ecosystem	PO11, PO12, PSO2
Mr. Laxmikant Shaligran, Mrs. Anupama Chandrachood, Mr. Yukinori Harada	Japanese Language Importance	05-10-2024	65	Gap in global communication and language competency	PO7, PO10, PSO2
Dr. Shitalkumar Rawandale Dean Training and Placement	Training and Placement strategies	21-09-2024	600	Gap in structured placement strategy and recruitment understanding	PO10, PSO2
Dr. Santosh Borde Dean student progression	Training and Placement Related	20-09-2024	500	Gap in placement awareness and career planning	PO10, PO12, PSO2
Mr. Yogesh Soman Platform Program Manager Mahindra	Interpersonal skills	24-08-2024	180	Gap in teamwork, communication, and professional behaviour	PO8, PO9, PSO2
Mr. Kawstov Singh Mahindra & Mahindra	Electric Vehicles – The Future of Automobiles	03-08-2024	95	Gap in EV technology awareness and emerging automotive trends	PO5, PO12, PSO1
Mr. Dipen Sahu Innovation Officer, (MIC), India	Orientation Session	05-08-2024	300+	Gap in institutional innovation ecosystem understanding	PO12, PSO2

Resource Person with Designation	Title/Topic Addressed	Date	Number of students Participated	Gaps Addressed	Impact Analysis (PO & PSOs)
Mr. Dipen Sahu Innovation Officer, (MIC), India	YUKTI Innovation	02-08-2024	300+	Gap in innovation documentation and startup pipeline	PO5, PO12, PSO1
Mr. Dipen Sahu Innovation Officer, (MIC), India	IIC Linkages	31-07-2024	200+	Gap in mentorship and institutional collaboration	PO9, PO10, PSO2
Mr. Dipen Sahu Innovation Officer, (MIC), India	Innovation Ambassadors	29-07-2024	200+	Gap in innovation leadership and capacity building	PO9, PO12, PSO2
Mr. Gurpreet Singh Learning and Development Manager	Career Readiness Program	08-07-2024	90	Gap in employability and professional skills	PO9, PO10, PO12, PSO2
Adv. Shalini Sonawane Criminal Lawyer	Sexual Harassment of Women at Workplace	08-03-2024	200+	Addressed awareness gap in legal rights and workplace safety	PO6, PO8, PSO2
Dr. Yogesh Fulpagare Product Manager Taiwan	Process of Innovation Development	24-02-2024	200	Gap in innovation lifecycle and product development methodology	PO3, PO5, PSO1
Mr. Arjun Deshpande Founder & CEO	Motivational Session	21-01-2024	150	Gap in entrepreneurship exposure	PO10, PO12, PSO2
Mr. Arjun Malhotra Co-Founder HCL	Innovation Outreach	22-12-2023	300+	Gap in industry exposure and ecosystem understanding	PO5, PO7, PSO1
Ex-Servicemen & NCC Coordinators	Vijay Diwas Celebration	26-07-2023	200+	Gap in civic responsibility and national awareness	PO6, PO8, PSO2
Mr. Prashant Bagul	Garba & Dandiya	22-09-2022 to 26-09-2022	~600	Gap in cultural awareness and social interaction	PO9, PO8, PSO2
Dr. S. Wadile, Mr. Nerpagar, Dr. V. S. Patil	Yoga Day	21-06-2022	200+	Gap in physical fitness and stress management	PO8, PO12, PSO2
Dr. Sanjay Shah SVNIT Surat	Journey of Life	08-06-2022	200+	Gap in mental, social, and personal development	PO12, PO8, PSO2

Outcomes of Activities

- Research Orientation: Enhanced understanding of global research challenges and interdisciplinary approaches, improving problem identification and research skills (PO1, PO2, PO4; PSO1, PSO2).
- Innovation & IPR Competence: Improved awareness of patents and IPR processes, strengthening innovation planning, problem-solving, and protection of research outcomes (PO1, PO2, PO4; PSO1, PSO2).
- Lifelong Learning & Career Planning: Increased clarity on overseas education and career pathways, promoting higher studies and self-directed learning (PO12).

- Global Communication Readiness: Improved preparedness for international education and multicultural environments through language and test-prep exposure (PO10, PO12).
- Global Employability Awareness: Motivated students to acquire additional skills and certifications, enhancing adaptability to global industry requirements (PO10, PO12).

C. Pre-Placement Talks

Pre-placement talks prepare students for industry expectations by offering details about recruitment processes, job roles, and required skills, thereby enhancing employability, confidence, and industry readiness while supporting PO and PSO attainment. Table 2.8.4 represents industry awareness and training activities with POs-PSOs impact.

Table No.2.8.4: Industry Awareness, and Training Activities with PO-PSO Impact

Name of the Activity	Date	No. of Students	Gaps Addressed	Impact Analysis (POs & PSOs)
Coditas Company Orientation	09-11-2025	220	Gap in understanding company expectations	PO9, PO10
Netwin Company Orientation	04-10-2025	100	Gap in understanding company expectations	PO9, PO10
Webtech Company Orientation	01-02-2025	279	Gap in understanding company expectations	PO9, PO10
AI Driven Patent Search	02-12-2024	150	Lack of exposure to IPR and patents	PO4, PO12, PSO1
Pool Campus Drive Instructions	15-10-2024	186	Insufficient clarity on recruitment procedures	PO9, PO10
Skill Development Programme	11-08-2024	120	Need for overall skill enhancement	PO9, PO10, PO12
Discussion on Programming Skills	07-05-2024	23	Weak programming fundamentals	PO1, PO2, PSO1
Cyber Security & Data Science Careers	04-05-2024	52	Limited awareness of emerging career domains	PO1, PO12, PSO1
Product Based Information	26-02-2024	141	Gap in knowledge of product-based companies	PO10, PSO2
Full Stack & PHP/.NET Training	15-03-2024	75	Skill gap in software technologies	PO5, PO10, PSO2
Pre Placement Talk on TCS NQT	04-03-2024	125	Lack of awareness of recruitment assessments	PO10, PO12
Netwin Company Orientation	08-12-2023	216	Gap in understanding company expectations	PO9, PO10
Overview of Just Dial Company	18-04-2023	40	Lack of exposure to service-based industry	PO1, PO9, PO10

Name of the Activity	Date	No. of Students	Gaps Addressed	Impact Analysis (POs & PSOs)
DTDC Company Pre Placement Talk	25-03-2023	127	Limited awareness of logistics industry roles	PO1, PO10, PSO2

D. Alumni Interaction

Alumni interactions enrich the teaching-learning process by sharing industry experiences, career guidance, and emerging trends, helping students connect theory with practice and improving learning outcomes, employability, and PO-PSO attainment. Table 2.8.5 represents alumni interaction and its impact on POs-PSOs attainment.

Table No.2.8.5: Alumni Interaction and Its Impact on PO-PSO Attainment

Resource Person with Designation	Expertise Domain	Title/Topic Addressed	Date	No. of Students Participated	Gaps Addressed	Impact Analysis (PO-PSO Mapping)
Mr Khatik Kaship, Mr. Jagdish Saindane, NRB Bearing Pune	Trainee Engineer	Effective communication skills (verbal & non-verbal) during interviews, Confidence and self-presentation abilities, Knowledge of interview formats and expectations	28-07-2025	53	Gap in communication skills, interview preparedness, and self-presentation abilities	PO8, PO9, PO10, PSO2
Mr. Harshal Mhaske, Miss. Payal Patil, Mr. Hitesh Shinde, Mr. Harshal Bhamare (Johnson Controls (JCI) Pune)	Trainee Engineer	How to prepare for Test and interview of JCI	08-09-2025	125	Gap in understanding recruitment process, aptitude preparation, and company-specific interview expectations	PO1, PO2, PO10, PSO2
Mis Surbhi Uday Marathe, Mis Bhavsar Riddhi Kailas (Trainee Engineer Forvia)	Trainee Engineer	How to prepare for Test and interview of Forvia	28-09-2025	24	Gap in interview preparation, technical test readiness, and company-specific selection criteria	PO1, PO2, PO10, PSO2

Resource Person with Designation	Expertise Domain	Title/Topic Addressed	Date	No. of Students Participated	Gaps Addressed	Impact Analysis (PO-PSO Mapping)
Mr. Nikhil Sharma, Automotive Aftersales Engineer, Hyundai Motor Deutschland	Automotive Aftersales Engineer	Career path in Germany, how to get Internship and Readiness for MS in Germany	10-11-2025	119	Gap in awareness of international career opportunities, higher education pathways, and global industry exposure	PO6, PO7, PO12, PSO1, PSO2
Mr. Sandip Thakare (Asst. Vice President at Union Bank of Switzerland, Poland)	Vice President	Career guidance and professional skill development	09-10-2024	120	Gap in career clarity, professional decision-making, and industry expectations	PO8, PO10, PO12, PSO2
Mr Vikas Gavali, Mr Anurag Pimpriya (Shree Cement Pvt. Ltd, Rucha Engg Pvt. Ltd)	Graduate Engineer Trainee	Effective communication skills (verbal & non-verbal) during interviews, Confidence and self-presentation abilities, Knowledge of interview formats and expectations	15-10-2024	17	Gap in communication skills, confidence building, and interview readiness	PO8, PO9, PO10, PSO2
Mr. Mihir Shah, Mr. Sudarshan Pawar (Ralson Tyres Indore, Cosmo Films Pvt Ltd Sambhaji Nagar)	Project Engineer	How to prepare for Test and interview of Ralson Tyres	13-01-2025	63	Gap in core industry recruitment preparation and interview performance	PO1, PO2, PO10, PSO1
Mr. Adarsh Bhiku Trivedi, EV Plastic Trims (Currently working in Vietnam on EV)	Senior Manager	Design engineering job prospects in India and abroad	02-03-2025	123	Gap in awareness of design engineering careers and global opportunities in EV sector	PO3, PO5, PO12, PSO1

Resource Person with Designation	Expertise Domain	Title/Topic Addressed	Date	No. of Students Participated	Gaps Addressed	Impact Analysis (PO-PSO Mapping)
Mr. Dhiraj Amol Patil, Knorr-Bremse Technology Centre India Ltd., Pune	Senior Design Engineer (Electromechanical – Rail Brakes)	Preparing for PhD, Role responsibility of Design Engineer, Role of Mechanical Engineers	04-05-2025	62	Gap in understanding higher education pathways and advanced engineering roles	PO1, PO3, PO12, PSO1
Mr. Kiran Nikam, Tata Technologies Pune	Associate Technical Specialist Design	Design Internship, Design engineering job prospects in India and abroad	05-03-2025	7	Gap in design internship awareness and industry-oriented skill development	PO3, PO5, PO12, PSO1
Mr. Manish Patil, DTDC Express Ltd Mumbai	Manager	Career path in Logistic company, how to prepare for company and interview	09-03-2023	86	Gap in logistics industry awareness and recruitment preparation	PO6, PO10, PSO2
Mr. Junaid Shaikh	Associate Developer	Coding skills and interview skills, How to get job in IT	19-11-2022	68	Gap in programming skills and IT career awareness for mechanical students	PO1, PO5, PO12, PSO1
Mr. Rakesh K. Rajput	Design Leader	Career in Mechanical Design	19-11-2022	72	Gap in understanding mechanical design career opportunities	PO3, PO5, PO12, PSO1
Mr. Pranav Sharma, e-Emphasys Technologies	Software Developer	Career for Mechanical Engineer in IT	02-12-2022	82	Gap in awareness of IT career pathways for mechanical engineers	PO1, PO5, PO12, PSO1
Mr. Manoj Nerkar	Project Engineer	Campus preparation	29-12-2022	46	Gap in campus placement preparation and employability skills	PO8, PO9, PO10, PSO2

E. Industry Supported Laboratories and Impact Analysis

To enhance industry readiness among students, the Mechanical Engineering Department implemented industry-oriented training initiatives. The department effectively addressed industry exposure gaps through industry-oriented training programs conducted during summer and winter vacations. These programs focused on current and relevant technologies such as robotics and automation, CAD/CAM/CAE, and related tools widely used in the manufacturing industry. The training enhanced students'

practical skills, problem-solving ability, and understanding of real-world applications, thereby bridging the gap between academic learning and industry requirements. Table 2.8.6 represents a sample summary of industry-provided training and student participation, and Table 2.8.7 shows the outcome-based impact of industry-oriented training.

Table No. 2.8.6: Sample Summary of Industry-Provided Training and Student Participation

Name of Training Institute	Training Provided	No. of Students Benefitted	Topics Covered
Bajaj Training	Classroom-based technical training, workshops, expert sessions, internship and placement support	100+	<ul style="list-style-type: none"> • Core technical training on Automobile Manufacturing Processes • Workshops & technical sessions • Automation and Robotics in Manufacturing • PPC, Supply Chain and Inventory Management Maintenance Practices

Table No. 2.8.7: Outcome-Based Impact of Industry-Oriented Training

Aspect	Description (NBA Perspective – Mechanical Engineering)
Gap Addressed	Bridged the gap between academic curriculum and industry requirements by providing hands-on exposure to core mechanical domains such as CAD/CAM/CAE, robotics and automation in manufacturing, and modern engineering tools. This enabled students to understand real-time industrial practices and design methodologies.
Skills Developed	Enhanced students' practical engineering skills, analytical thinking, and problem-solving abilities through application-oriented learning. Improved proficiency in design, simulation, manufacturing processes, and use of modern engineering tools relevant to mechanical systems.
Relevance to PO	Contributed to attainment of PO1 (Engineering Knowledge) through application of fundamental concepts; PO3 (Design/Development of Solutions) through exposure to design and analysis tools; PO5 (Modern Tool Usage) through hands-on training in CAD/CAM/CAE; and PO12 (Life-long Learning) by encouraging continuous skill development aligned with evolving technologies.
Relevance to PSO	Strengthened program-specific outcomes by enhancing competencies in mechanical system design, manufacturing processes, and application of modern tools for analysis and product development. Improved readiness for industry-oriented roles in core mechanical and allied sectors.

3 OUTCOME-BASED ASSESSMENT (120)

Total Marks 120.00

3.1 Evaluation of Continuous Assessment: Assignments, Unit Tests, Mid-Term, etc. (10)

Total Marks 10.00

As per the Autonomy curriculum of Institute, for attaining COs, POs and PSOs, Internal Assessment is conducted through Term Tests and Teacher Assessment components. The mark distribution scheme followed for internal and external examination is as shown in Table 3.1.1.

Table 3.1.1: Mark Distribution of Internal and External Examination

Sr. No.	Evaluation Parameter	Marks
Theory (35%- Internal, 65%- External)		
1	Term Test-1 (TT-1) and Term Test-2 (TT-2) are conducted 30 marks each and scaled down to 15	15
2	Teacher Assessment	20
3	End Semester Examination (ESE)	65
Practical (50%- Internal, 50%- External)		
1	Continuous Assessment Laboratory (CA)	25 5 0
2	End Semester Examination Laboratory (ESE)	25 5 0

A. Process for setting and evaluation of internal semester question paper

- Combination of summative and Informative assessment enables assessing and evaluating students in periodic intervals improves the impact of estimating performance in terms of outcomes.
- In this context, assessment/evaluation refers to the process of determining the value of the instruction given in the classroom and the degree to which course objectives have been fulfilled.
- The alignment of course outcomes, curriculum, pedagogy, and assessment contributes to the total learning experience for students clearer and more meaningful because assessment/evaluation is blended with teaching-learning pedagogy.
- For efficient learning of students, the institute makes sure that assessment techniques are well-aligned with learning outcomes and ensures measurable attainment.

Process to Ensure Quality

- The department wise examination coordinators are appointed to ensure confidentiality and security during the examination.
- The departmental examination coordinator for TT-1 and TT-2 (duration: 1 hour) ensures smooth conduction of examination and concerned course teachers frame question banks/papers for the prescribed syllabus. The questions are framed according to
 - The curriculum and assessment frameworks for different courses.
 - The course outcomes and bloom taxonomy levels are mapped. The question paper audit/moderation ensures that all the COs are addressed.
 - Controller of examination prepares Internal Examination Time Table and Dy. Director and Director approves it.

A.1. Term Test Paper Based on Question Bank

For the 2023–24 batch, the following process is adopted:

Preparation of Question Banks

- Course teachers prepare and submit comprehensive question banks to the examination coordinator.
- Each question bank covers the full syllabus decided for Term Test, ensuring an appropriate mix of knowledge-based, analytical, and application-oriented questions as per Bloom's Taxonomy.
- For a course, the question bank comprises of 8-10 questions for each unit.
- Questions are also mapped to the relevant Course Outcomes (COs) for outcome-based evaluation.

Review and Finalization

- The question banks are reviewed by the module coordinator, who checks for syllabus coverage, cognitive level balance, and alignment with COs.
- Suggestions are provided if required, and the finalized version is forwarded to the Head of Department (HOD) for approval.

Selection of Paper for Examination

- During the term test, the Controller of Examinations (COE) selects questions from the approved question banks according to the prescribed paper pattern (including marks distribution).

- The finalized papers are then distributed to students at the time of the examination.

Evaluation Process

- Answer sheets are evaluated by respective course teachers within one week from the completion of test.
- A detailed marking scheme is followed to ensure fairness and consistency.
- Evaluated answer sheets are then shown to students for self-analysis, enabling them to identify strengths and weaknesses.

Documentation

- The entire process, including copies of the question papers, marking schemes, student performance analysis, and CO attainment reports, is maintained in Course Files as evidence for accreditation and quality assurance.
- After every internal assessment test, the course teachers discuss the solution of the questions in the class which enable students to perform well in the final examinations.
- The evaluation process helps in identifying the slow learner students among the class.

Format of Question Bank for TT-1 and TT-2: (Batch 2023-24)

Table 3.1.2: Question Bank Format TT-1 and TT-2

Type of questions per unit	Total No.	No. of questions selected by COE	No. of questions mandatory to attempt	Marks
Short Answer Questions	04 or 05	2	2	02 X 05 = 10
Long Answer Questions	04 or 05	2	2	02 X 10= 20

A.2. Term Test Paper Based on Question Paper Set(s)

For the 2024–25 batch, the following process is adopted:

Preparation of Question Papers

- Each course teacher prepares and submits two sets of question papers (with solutions and marking schemes) to the Examination Coordinator/Examination Office.
- These papers are designed to ensure adequate syllabus coverage, representation of different cognitive levels as per Bloom's Taxonomy, and alignment with the respective Course Outcomes (COs).

Review and Finalization

- The question papers are reviewed by the module coordinator, who checks for syllabus coverage, cognitive level balance, and alignment with COs.
- Suggestions are provided if required, and the finalized version is forwarded to the Head of Department (HOD) for approval.
- Once finalized, the hard copies/Soft copies of the question papers are submitted to the Examination Department.

Selection of Paper for Examination

- On the day of the test, the COE selects one paper from the two submitted sets.
- This selected paper is then printed, distributed, and administered to students under standard examination protocols.

Evaluation Process

- Answer sheets are evaluated by respective course teachers within one week from the completion of test.
- A detailed marking scheme is followed to ensure fairness and consistency.
- Evaluated answer sheets are then shown to students for self-analysis, enabling them to identify strengths and weaknesses.

Documentation

- The entire process, including copies of the question papers, marking schemes, student performance analysis, and CO attainment reports, is maintained in Course Files as evidence for accreditation and quality assurance.
- After every internal assessment test, the course teachers discuss the solution of the questions in the class which enable students to perform well in the final examinations.
- The evaluation process helps in identifying the slow learner students among the class.

Format of Question Paper for TT-1 and TT-2: (Batch 2024-25)

Table 3.1.3: Question Paper Format TT-1 and TT-2

Type of questions	No of question papers prepared by course faculty	No. of question paper selected by COE	Total No. of questions in question paper	No. of questions mandatory to attempt	Marks
Short Answer Questions	2	1	2	2	02 X 05 = 10
Long Answer Questions			4	2	02 X 10 = 20

Term Test Examination Process Flow

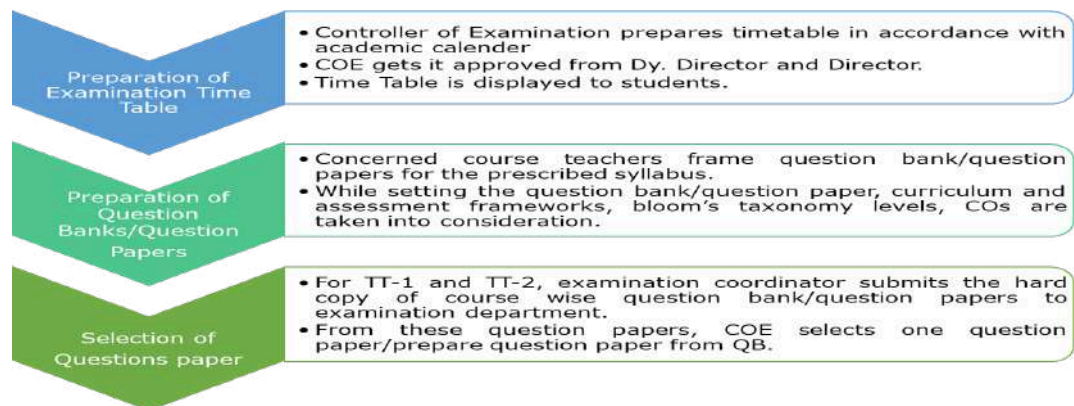


Figure 3.1.1: Term Test Examination Process Flow

B. Quality of questions, appropriateness of mapping with the COs

- The department ensures that the questions used in term tests evaluate students at different cognitive levels.
- Questions are designed according to Bloom's Taxonomy levels. Each question is mapped with the appropriate CO.
- The paper contains a balanced mix of conceptual, analytical, and problem-solving questions.
- Internal question papers undergo departmental moderation by module coordinator to maintain academic quality.
- The sample copy of term test question paper is as shown in Table 3.1.4 and 3.1.5.

Table 3.1.4: Term Test-1 Examination Question Paper



**R. C. PATEL
INSTITUTE OF TECHNOLOGY**

(An Autonomous Institute)
Near Nimzari Naka, Shripatha Road, Shirpur - 425405, Dist. Dhule (MS)
Telephone: (02543) 259606, 801, 802 Web: www.rcpit.ac.in E-mail: principal@rcpit.ac.in

A.Y.-2023-24 – Department of Mechanical Engineering (T Y B Tech)

EVEN SEMSTER (SEM- II) TT-I (Marks-30)

Subject- Refrigeration & Air Conditioning (PCME6020T)

Day & Date- 30/03/2024, Saturday

Time- 10.00 a.m. to 11.00 a.m

Q. No.	All Questions are Compulsory	CO Mapped (Correlation Level)	Blooms' Level	Max. Marks
Q.1	Explain Unit of refrigeration and Coefficient of Performance.	CO1	L2	5
Q.2	In an air refrigeration system air is compressed in an air compressor according to the law $PV^n=C$ from initial temperature of T_1 to T_2 . It is then cooled at constant pressure from T_2 to T_3 and then is expanded according to law $PV^n=C$ to T_4 . It is then passes through the refrigerator chamber at constant pressure and leaves it at T_1 show that $COP = \frac{T_1 - T_4}{\left(\frac{n}{n-1}\right)\left(\frac{\gamma-1}{\gamma}\right)\left[T_4 - T_3 + T_2 - T_1\right]}$	CO1	L3	10
Q.3	Draw T-s and P-h diagram for refrigerant wet after compression in VCR system	CO2	L3	5
Q.4	Draw a neat compact diagram of Aqua ammonia absorption refrigeration system and explain its working. List out the major fields of applications of this refrigeration system?	CO2	L2	10

Table 3.1.5: Term Test-2 Examination Question Paper



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(An Autonomous Institute)
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Telefax: 0225631 259650, 801, 802 Web: www.rcpit.ac.in E-mail: princi@rcpit.ac.in

A.Y.-2023-24 – Department of Mechanical Engineering (T Y B Tech)

EVEN SEMSTER (SEM- II) TT-II (Marks-30)

Subject- Refrigeration & Air Conditioning (PCME6020T)

Day & Date- 30/04/2024, Tuesday

Time- 10.00 a.m. to 11.00 a.m.

Q. No.	All Questions are Compulsory	CO Mapped (Correlation Level)	Bloom's Level	Max. Marks
Q.1	Analyze By-Pass factor for sensible heating and sensible cooling	CO3	L4	5
Q.2	The readings from a sling psychrometer are as follows: DBT=30°C, WBT=20°C, Barometer reading=740 mm of Hg. Using steam tables determine 1. DPT 2. RH 3. Degree of Saturation 4. Sp. Humidity	CO3	L3	10
Q.3	Derive an equation for equivalent diameter of circular duct for rectangular duct.	CO4	L3	5
Q.4	The room Sensible and latent heat loads, for an air-conditioned space are 25 KW and 5 KW respectively. The room conditioning is 25°C DBT and 50% RH. The outdoor condition is 40°C DBT and 50% RH. The ventilation requirements are such that on mass flow rate basis 20% of fresh air is introduced and 80% of supply air recirculated. The BPF of the cooling coil is 0.15. Determine: 1. Supply air flow rate 2. Outside Air sensible heat 3. Outside latent heat 4. Grand total heat	CO4	L3	10

C. Assessment of COs coverage in unit tests/class tests/mid-term tests/assignments

The department ensures that all course outcomes are assessed through internal evaluation components

C.1. Assessment of COs coverage through term tests

- Each question is mapped to a specific CO. CO coverage is verified using a CO-Question Mapping Table in attainment sheet.
- Performance data is collected for each CO.
- CO attainment is calculated using the percentage of students achieving the set benchmark.
- This ensures that internal assessments contribute effectively to CO attainment measurement.

C.2. Assessment of COs coverage through Teacher Assessment Components

The Institute has standardized the Continuous Assessment (CA) policies for FY, SY, TY and Final Year B. Tech students. To ensure holistic development and enhance the industry readiness of students, the department implements a structured Continuous Assessment (CA) framework of 35 marks. This framework is designed to evaluate students not only on academic knowledge but also on aptitude, innovation, and professional skills. At the college level, students are assessed through centralized term tests and an aptitude test conducted by the T&P department, which ensures uniformity and benchmarking across all branches. At the department level, assessment is diversified into components such as presentations, mock interviews, Quiz, GD, course-specific innovative assessment component, NPTEL/SWAYAM courses and skill enhancement exercises.

These components focus on practical applications, real-world problem-solving, and professional readiness. The overall system thus balances academic rigor with experiential learning, preparing students for both higher studies and industry careers. The amendments focus on enhancing fairness, constructive alignment with learning outcomes, and incorporating skill-based, industry-oriented, and professional development components. The details are given in Table 3.1.6.

Table 3.1.6: Continuous Assessment Policy (Batch 2024-25)

Component	FY B. Tech	SY B. Tech	TY B. Tech	Final Year
Term Test Marks	15 marks	15 marks	15 marks	10 marks
Presentation/Virtual Lab/CodeChef	05 Marks	05 Marks	05 Marks	05 Marks
Group Discussion	05 Marks	05 Marks	--	--
Moodle Quiz	--	--	05 Marks	--
Mock Interview	--	--	--	05 Marks
Innovative Component	10 Marks	10 Marks	10 Marks	05 Marks
TA4/Skill Enhancement + Aptitude	--	--	--	10 Marks
Total Continuous Assessment	35 Marks	35 Marks	35 Marks	35 Marks

C.2.1. Key Components of the Continuous Assessment Policy

Term Tests

- Two term tests Term Test-1 and Term Test-2 are conducted per semester, each of 30 marks. The marks are scaled down to 15|10.
- Additional weightage: Students can earn bonus marks through **online certifications** to encourage **self-learning and lifelong learning skills**. Only courses from NPTEL/SWAYAM are allowed.

Aptitude Test

The aptitude tests are conducted in each semester. The marks obtained are converted to a standardized scale of 0 to 5 per course. The syllabus coverage follows a progressive approach, where students in lower semesters are tested on the syllabus covered within the same semester, while students in higher semesters are assessed on cumulative content from earlier semesters.

Teacher Assessment

A Teacher Assessment component covering academic, communication, innovation, and skill aspects:

TA-1: Presentation/Group Discussion/V-Lab/Moodle Quiz

The HOD and Department Examination Coordinator, in consultation with faculty members, assign one assessment component from the available components such as Presentation, Group Discussion, Moodle Quiz, or Virtual Lab to each course in the semester. Such distribution ensures variety, fairness, and balanced exposure to different assessment methods, helping students develop diverse academic and professional skills.

TA-2: Mock Interview

Mock interviews are conducted to simulate industry recruitment processes. The Training and Placement Department (T&P) compiles a repository of real interview questions asked during campus drives and company recruitment processes. Each course faculty prepares a question bank of 30 questions and shares them with students for preparation. Interviews are conducted by alumni from industry along with course faculty. Students receive personalized feedback from alumni and course experts regarding their strengths, weaknesses, and improvement areas.

TA-3: Innovative Component

Students are evaluated on creativity and innovation through activities such as case studies, field visit, challenge base learning, learn by doing and simulation, etc. Students work in groups and complete the activity within a specified time. Marks are awarded based on quality, completion, and creativity, encouraging application of knowledge to real-world problems.

TA-4: Skill Enhancement

This component is designed to bridge academic knowledge with industry requirements, ensuring that students acquire practical exposure, professional skills, and industry readiness. It emphasizes hands-on learning, problem-solving, and innovation through a variety of structured activities. This includes:

- Coding and Design Platforms:** Performance and participation on reputed platforms such as CodeChef, MATLAB, Python, AutoCAD, Fusion 360 and Ansys are assessed to enhance coding proficiency, competitive programming and design skills.
- Internships:** Completion of short-term internships (online/offline), verified by the Training and Placement (T&P) department, provides students with practical exposure to industry tools, workflows, and practices.
- Professional Certifications:** Students are encouraged to pursue value-added certification courses approved by the department to validate their course expertise and strengthen employability.
- Foreign Language Proficiency:** Certifications in languages such as German and Japanese are recognized, enhancing students' global employability and communication skills.
- Competitions and Hackathons:** Participation in national-level competitions such as Smart India Hackathon (SIH), SAE events, Robocon, and other recognized offline Hackathons/Techfests nurtures teamwork, design thinking, innovation, and problem-solving abilities.
- Research and Innovation:** Students are encouraged to pursue research activities, including filing Intellectual Property Rights (IPRs) and publishing papers in reputed journals. Each IPR filed or journal paper publication carries 5 marks as recognition of innovation and contribution to knowledge creation.

Overall, the policy is designed to ensure balanced evaluation – measuring not only academic knowledge but also aptitude, communication, problem-solving, practical skills, and professional readiness, in line with OBE framework.

D. Sharing of post evaluation feedback with students for performance improvement

To ensure transparency and support continuous improvement in student performance, post-evaluation feedback is shared with students in a structured manner. After evaluation, course-wise term work is made visible to students through a Google Drive link in view-only mode. This live access allows students to review their assessed term work, understand the marks awarded, and identify areas for improvement without any risk of data modification. Further, the evaluated term work marks are officially displayed to students, followed by a defined grievance period. During this period, students may approach the respective course teachers to raise any concerns or discrepancies related to their evaluation. The course teachers verify such issues and carry out necessary corrections wherever applicable. After completion of the grievance period and resolution of all valid concerns, the corrected term work is displayed again as the final term work to students. This feedback and grievance mechanism ensures fairness, clarity in evaluation, and effective academic performance enhancement.

3.2 Evaluation of the Semester End Exam (SEE) Question Paper (10)

Total Marks 10.00

The End Semester Examination (ESE) is conducted to assess the comprehensive knowledge, skills, and application abilities of students at the end of the course. The institute also facilitates a credit transfer process for courses completed through the NPTEL / SWAYAM platform, provided that the course content has maximum resemblance with the institute's syllabus and the number of credits is equivalent to the respective subject. The approval of such credit transfer is carried out as per the NEP guidelines after verification of course syllabus, credits, and certification from the respective platform. The process of question paper setting, evaluation, and quality assurance is as follows:

A. Process for setting and evaluation of End Semester Exam (ESE) question paper

A.1. Process of Setting ESE Question Paper

The department uses a Question Bank Management System (QBMS) portal for preparing ESE question papers. The process is described below:

- **Constitution of Paper Setting Panel:** The Course-wise Paper Setting Panel is constituted by the Controller of Examinations (COE) from the panel provided by BOS through an Office Order.

- **Roles and responsibilities of Paper Setting Panel:**

Template Creator: The template creator discusses with the panel and finalizes the End Semester Examination (ESE) paper template, covering:

- Blueprint i.e. format and structure of the paper.
- Marks distribution and weightage as per module.
- Difficulty level distribution (Easy/Medium/Hard).
- Constructive alignment of questions with Course Outcomes (COs).
- The template follows Bloom's Taxonomy levels.

Author: Uploads questions, marking scheme and solutions in the portal. Each author contributes a minimum of five questions per unit/module aligned with the blueprint.

Reviewer: Reviewer verifies the quality, correctness and CO alignment of questions, marking scheme and solutions uploaded. If any discrepancy in a question is found, the reviewer reverts the question(s) back to the author for correction. After verification, the reviewer seals the questions.

This collaborative approach ensures variety, quality, and alignment in the final paper.

Auto-Generation of final ESE question paper - From the pool of sealed questions, the final question paper is automatically generated as per the blueprint. Figure 3.2.1 demonstrates the Process of Setting ESE Question Paper using QBMS Portal.

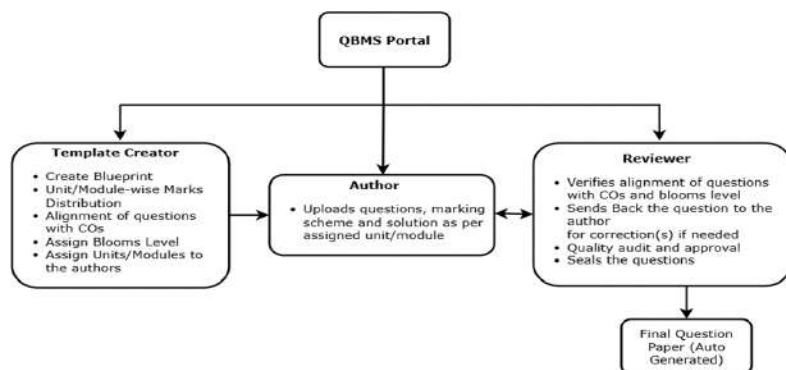


Figure 3.2.1: Process of Setting ESE Question Paper using QBMS Portal

A.2. Process for Evaluation of ESE Answer Sheets

- **Evaluation of Answer Sheets:** Answer sheets are evaluated using a detailed marking scheme/model solution to ensure fairness, uniformity, and transparency in assessment.
- **Digital Evaluation System:** Institute follows a fully online digital evaluation process through the ERP Platform. After the End Semester Examination (ESE), answer sheets are scanned and uploaded along with the corresponding question paper and model answer key.
- **Faculty Allocation and Appointment Orders:** The examination department manages the course-wise allocation of scanned answer sheets, ensuring a fair and balanced distribution of evaluation work among faculty members. The COE also issues an Office Order appointing evaluators and moderators.
- **Moderation:** Moderation of answer sheets is done through internal/external evaluators to maintain authenticity, consistency, accuracy, and objectivity in the evaluation process.

B. Quality of questions, appropriateness of mapping with COs

The institute ensures that the ESE question papers maintain high academic standards and effectively assess the Course Outcomes through a well-defined process.

- Questions are framed to cover different cognitive levels of Bloom's Taxonomy.
- Each question is mapped with the corresponding CO, ensuring that all COs of the course are adequately assessed.
- The question papers blueprint ensures balanced coverage of syllabus units and appropriate distribution of marks across COs.
- The reviewer verifies the accuracy, clarity, difficulty level, and CO mapping of the questions before sealing the paper, thereby maintaining the overall quality of the examination
- An external examiner is appointed by COE to review the question papers for quality, clarity, difficulty level and COs.

C. Transparency of post evaluation process

The institute follows a transparent post-evaluation process to ensure fairness and accuracy in assessment. After declaration of results, students are provided the facility to apply for rechecking or re-evaluation of their answer sheets through the examination section. Students can request verification of total marks, evaluation correctness, or reassessment as per the institute's examination regulations. Any corrections identified during this process are updated in the final results. This mechanism ensures transparency, accountability, and confidence in the evaluation system.

3.3 Evaluation of Laboratory Work and Workshop (Continuous and SEE) (10)

Total Marks 10.00

Laboratory courses form a critical component of the curriculum, designed to bridge theoretical learning with practical application. The evaluation process ensures that students are not only able to perform experiments and technical tasks but also develop skills such as teamwork, communication, innovation, and problem-solving. Both Continuous Assessment (CA) and End Semester Examination (ESE) are used for comprehensive evaluation.

A. Evaluation of experiments conducted in workshops/laboratories

The evaluation of laboratory courses consist continuous assessment (CA) and laboratory ESE.

A.1 Continuous Assessment (CA) of Laboratory

The CA evaluation of laboratory course is based on following

- **Performance:** Evaluation based on accuracy, systematic procedure, and ability to troubleshoot errors.
- **Preparation of Journal/Practical Record:** Students must maintain journals with well-documented observations, results, and inferences. Course faculty provides a standard lab manual/SOP to guide students in completing their journal submissions.
- **Use of Virtual Laboratory V-Lab:** For selected courses, practical performance is assessed using IIT Bombay's Virtual Laboratory platforms that provide a simulated environment for conducting experiments and analyzing results. This approach allows students to perform experiments beyond physical lab constraints, with evaluation based on procedure execution, observations, and result interpretation.
- **Viva-Voce:** Tests conceptual understanding, clarity of theory, and ability to relate practical outcomes with theoretical principles.
- **Case Study/ Assignment:** Course-specific case studies or assignments are assigned to students as an additional practical component. Students are required to carry out the assigned work either individually or in groups and submit a detailed report based on their analysis and findings for evaluation.

A.2 Evaluation of Laboratory ESE

The ESE for laboratory courses is designed to comprehensively assess students' practical skills and applied knowledge. Two examiners, appointed by the Controller of Examinations (COE), independently evaluate each student's performance, and the final marks are awarded based on their combined assessment. During the examination, students are assigned an experiment or problem to perform independently within a specified time. In addition, a viva-voce is conducted to evaluate students' conceptual understanding and problem-solving approach.

B. Use of Rubrics for assessing student performance with relevance to COs/POs

Rubrics are used to evaluate laboratory performance in a structured and objective manner, ensuring that assessment criteria are clearly defined. The rubrics are defined separately for CA and ESE evaluation of Laboratory course.

B.1. Rubrics for Laboratory CA Evaluation

- Marks are awarded experiment-wise and cumulative performance is calculated.
- Rubric sheets, along with evaluated journals, are preserved in Course Files.
- Each experiment is assessed for fifteen marks according to the rubrics provided in Table 3.3.1.
- An additional component in the form of a case study/assignment for each course is evaluated for ten marks.

Table 3.3.1: Rubrics for Laboratory CA Evaluation

Rubrics	Maximum Marks (If V-Lab available)	Maximum Marks (If V-Lab Not Available)
Performance	3	5
Journal Submission	5	5
Virtual Lab (if applicable)	2	--
Viva-Voce	5	5
Case Study/ Assignment	10	10
Total Marks	25	25

B.2. Rubrics for Laboratory ESE Evaluation

- Marks are awarded by examiners based on performance and viva-voce.
- Marks are sealed and submitted to COE.

Table 3.3.2: Rubrics for Laboratory ESE Evaluation

Rubrics	Maximum Marks
Performance	15 30
Viva-Voce	10 20
Total Marks	25 50

B.3. Relevance to COs/POs

The laboratory assessment process is aligned with defined Course Outcomes (COs), Program Outcomes (POs) and Program Specific Outcomes (PSOs) to ensure effective attainment of learning objectives. Each laboratory activity, including experiment execution, journal maintenance, viva-voce, virtual lab work, and case studies, is mapped to relevant COs. Performance and practical execution support the application of engineering knowledge and problem-solving skills, while documentation and viva-voce enhance communication and conceptual understanding. Case studies and assignments promote teamwork and independent learning. Rubrics-based evaluation enables objective measurement of CO attainment, which is further used for CO-PO attainment analysis.

3.4 Evaluation of Industrial Training/ Internship (Continuous and SEE) (10)

Total Marks 10.00

The internship process at institute is designed to ensure a smooth and systematic training and placement experience for students. Internships provide valuable educational and career development opportunities by allowing students to gain practical experience in their field of study. In Semester–VIII, students have two options for internships: Industry Internship and In-house Internship which contribute 10 credits.

A. Industry Internship

- The Training and Placement Department arranges internships for students in industries/organizations after Semester VII.
- The Training and Placement Department has established Memoranda of Understanding (MoUs) with reputed industries to enhance industry readiness among students. These MoUs facilitate structured industry-oriented training programs, including technical skill development, soft-skill enhancement, internships, workshops, and expert sessions conducted by industry professionals. Such collaborations bridge the gap between academic learning and industrial expectations, thereby improving students' employability, practical exposure, and professional competence in alignment with OBE requirements.
- Students may also apply individually, after obtaining prior permission and approval from the Training and Placement (T&P) Department.

Individual internships must follow these guidelines:

1. Only internships approved by the T&P Department will be considered.
2. Internship duration must be minimum 12 weeks.
3. Prior permission from the T&P Department is required before pursuing any independent internship.
4. Every student must maintain a file with documentary proof of activities completed.
5. Each student will be monitored periodically (onsite/online) by the Industry Mentor, Faculty Mentor, and Department T&P Coordinator (TPC) during the internship period.
6. Withdrawal from the internship is allowed only within two weeks of joining. Such students must continue Semester VIII academic activities along with an in-house internship.

A.1. Internship Report Guidelines

- Students should prepare a comprehensive report summarizing observations and learnings.
- Guidance can be sought from the Industrial Supervisor, Faculty Mentor, or department TPC for topic selection.
- Evaluation will consider:
 - Adequacy and purposefulness of the write-up.
 - Variety and relevance of learning experiences.
 - Practical applications and connections with theories/concepts from Semester I–VII.

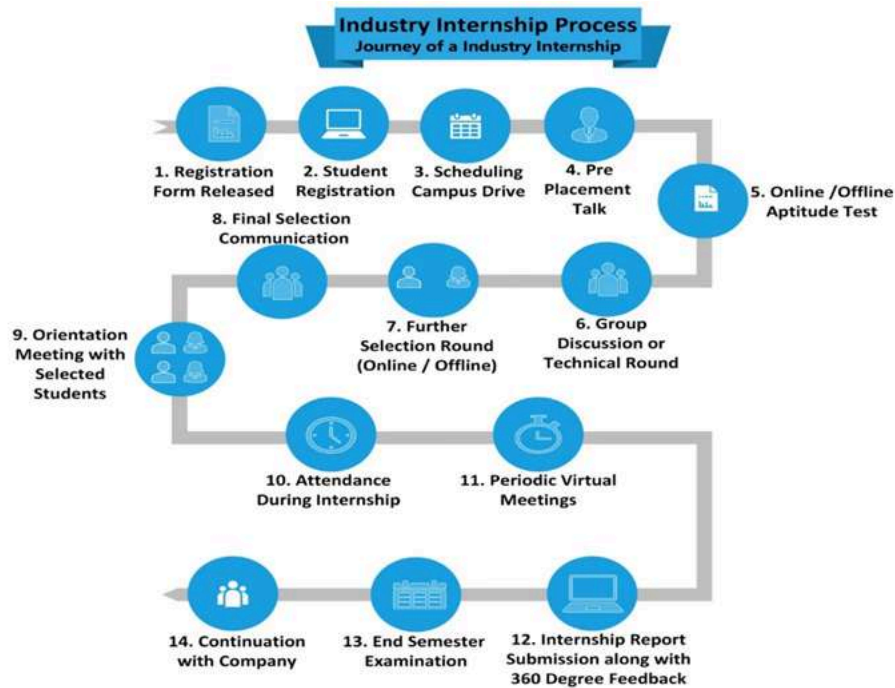


Figure 3.4.1: Flowchart of Industry Internship Process

A.2. Continuous Assessment for Industry Internship

The Continuous Assessment of the internship is intended to monitor and support the student's overall learning and development throughout the internship period. A minimum of two monitoring and evaluation assessments are performed during the internship. It focuses on evaluating the student's engagement with the assigned tasks, the practical experience gained, and the progress made in achieving the objectives of the internship. This assessment helps ensure that students are actively applying their knowledge, developing relevant skills, and demonstrating professional growth in a real-world setting. It also encourages students to document their work, reflect on their learning, and communicate their experiences effectively. Overall, continuous assessment provides a structured way to guide and enhance the student's internship journey. Following are the Rubrics of Continuous Assessment of Industry Internship.

Table 3.4.1: Continuous Assessment Rubrics for Industry Internship

Rubrics	Marks
Internship Objectives and Goals	30
Internship Experience and Skills Gained/Enhanced	30
Professional Development and Growth	30
Internship Report	30
Presentation	30
Total	150

A.3. End Semester Examination (ESE) Evaluation

The ESE aims to evaluate the overall internship experience, ensuring that students have effectively applied theoretical knowledge in a practical setting and demonstrated professional growth. Key aspects of the process include:

A.3.1. Appointment of Examiners

Two examiners, appointed by the Controller of Examinations (COE), independently evaluate each student's performance, and the final marks are awarded based on their combined assessment.

A.3.2. Standardized Evaluation Scheme

- Uniform rubrics are used across all students to ensure fairness, consistency, and transparency.
- The evaluation emphasizes practical engagement, skill development, and professional growth, alongside the ability to reflect and report on learning outcomes.
- The rubrics and Evaluation criterion is as given below:

Table 3.4.2: Evaluation Criteria of Industry Internship ESE

Rubrics	Marks
Internship Objectives and Goals	30
Internship Experience and Skills Gained/Enhanced	30
Professional Development and Growth	30
Internship Report	30
Presentation	30
Total	150

This structured evaluation ensures that students gain maximum benefit from their industry exposure and are well-prepared for future professional challenges.

B. In-house Internship

The in-house internship provides students with research-oriented opportunities to cultivate a research mind-set. It can either extend a project completed in Semester VI and VII (Project Stage-I and II) or involve new research objectives provided by the department or faculty mentor.

Guidelines

1. The in-house internship can be pursued individually or in groups.
2. Maximum group size is limited to four students.
3. If extending a Stage II project, outcomes should include product development, technology transfer, patents/copyrights, or at least one research publication.
4. The work must be submitted to the department as a hardbound and soft copy report.

B.1. Continuous Assessment for In-house Internship

Each group must maintain a logbook documenting all work carried out during the internship (see 3.4.3). Students are required to present their weekly progress to their mentor, demonstrating the tasks completed and milestones achieved.

Table 3.4.3 Logbook Format

Sr. No.	Week (Start – End)	Work Done	Mentor Sign	Coordinator Sign
1				

The internship performance is reviewed twice during the semester by a panel of faculty members, which evaluates the student's progress, engagement, and overall learning.

First Review: At this stage, at least 40% of the work should be completed. The evaluation is based on rubrics detailed in Table 3.4.4:

Table 3.4.4 Rubrics for First Review

Rubrics	Marks
Topic Identification and Validation	20
Literature Survey	20
Problem Definition	20
Objectives	15
Total	75

Second Review: The remaining 60% of work should be completed by the second review. The evaluation considers:

Table 3.4.5 Rubrics for Second Review

Rubrics	Marks
Implementation	20
Publications	20
Report	20
Presentation	15
Total	75

B.2. End Semester Examination (ESE) Evaluation

The End Semester Examination (ESE) serves as the final stage of evaluation for the In-house Internship. It aims to assess the student's overall learning, technical contributions, and ability to apply theoretical knowledge to practical or research-oriented problems. The evaluation process is designed to ensure fairness, transparency, and a holistic assessment of both the process and outcomes of the internship.

B.2.1. Appointment of Examiners

Two examiners, appointed by the Controller of Examinations (COE), independently evaluate each student's performance, and the final marks are awarded based on their combined assessment.

B.2.2. Standardized Evaluation Scheme

- A uniform evaluation framework is adopted across all students to maintain consistency and objectivity in the assessment process.
- The evaluation emphasizes the quality of research or implementation, professional development, and the ability to communicate findings effectively through reports and presentations.
- Equal importance is given to both technical execution and academic rigor demonstrated during the internship.

The rubrics and Evaluation criterion is as given below:

Table 3.4.6: Rubrics for ESE

Rubrics	Marks
Topic Identification and Validation	30
Literature Survey and Problem Definition	30
Objectives and Implementation / Product Development	30
Presentation	30
Report, Publications / Patent / IPR Documents	30
Total	150

C. Relevance to CO/PO

The internship program supports the attainment of Course Outcomes (COs) by enabling students to apply theoretical knowledge to real-world industrial or research problems through industry and in-house internships. These internships help students develop practical skills, professional competence, problem-solving ability, and self-directed learning habits, thereby bridging the gap between academic learning and industry requirements.

The evaluation rubrics for industrial training/internships are aligned with relevant Program Outcomes (POs) by assessing students' ability to identify and analyze real-world problems, conduct literature surveys, and define objectives, which relate to problem analysis (PO2) and investigation of complex problems (PO4). Implementation activities evaluate students' application of engineering knowledge (PO1) and Modern tool usage (PO5). Furthermore, the preparation of reports, presentations, and documentation of publications, patents, or IPRs assesses students' communication skills (PO10) and their ability to present technical work effectively.

Exposure to practical environments, mentoring, and independent learning encourages students to continuously update their knowledge and adapt to evolving professional requirements. Overall, this activity is strongly mapped to PO-12 (Lifelong Learning), as it motivates students to continuously acquire new skills and knowledge beyond the classroom.

According to the curriculum, the Capstone Project is divided into two stages: Project Stage-I (Semester-VI) and Project Stage-II (Semester-VII). Table 3.5.1 outlines the activities to be completed in each stage as per the curriculum.

Table No.3.5.1: Project Stages and Activities

Project Stage	Activities / Description
Project Stage-I: [Sem-VI] Problem Identification & System Design	<ul style="list-style-type: none"> • Preparation of a concise abstract and detailed introduction covering the problem domain, objectives, scope, relevance, and a comprehensive literature review of existing systems. • Design of the proposed system detailing architecture, methodology, and required hardware implementation. • Development of a clear Stage-II implementation plan including selected tools and an execution timeline.
Project Stage-II: [Sem-VII] System Development and Evaluation	<ul style="list-style-type: none"> • Implementation of the proposed system using appropriate tools and platforms. • Testing, validation, and performance evaluation with comparative analysis. • Conclusion and future scope identification based on results. • Preparation and submission of a project report.

The Department of Mechanical Engineering follows the procedure as shown in Figure 3.5.1 for Identification of projects and allocation methodology to faculty members.

A.Identification of Projects and Allocation Methodology

The project development process at R. C. Patel Institute of Technology, Shirpur is systematically designed in line with the OBE framework to ensure effective planning, execution and evaluation of student projects.

The Head of the Department appoints a Project Coordinator to systematically manage, supervise, and monitor all project-related activities. Students are then required to form project groups and submit three proposed project topics along with concise abstracts for review, ensuring appropriate evaluation and approval before project initiation.

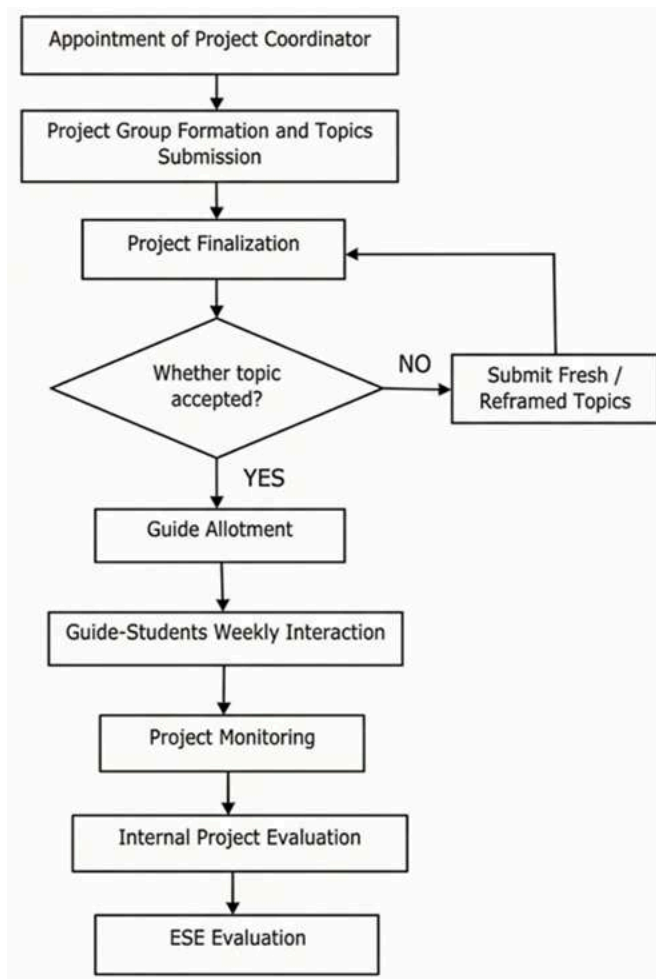


Figure 3.5.1: Process Flow for Project Topic Approval, Execution and Evaluation

- **Topic Finalization by Department:** Proposed project topics are rigorously evaluated based on relevance, innovation, technical depth. Topics not meeting the criteria are refined and resubmitted, while approved topics proceed to execution.
- **Guide Allocation:** Department Head and Project Coordinator allocate faculty guides based on domain expertise, ensuring effective technical guidance, mentoring, and outcome-oriented supervision.
- **Weekly Interaction and Monitoring:** Structured weekly meetings during scheduled project hours facilitate continuous progress monitoring, technical discussion, and timely resolution of challenges.
- **Project Review and Internal Evaluation:** Periodic reviews during regular monitoring, presentations, and internal assessments are conducted to evaluate innovation, methodology, implementation quality.
- **Final Evaluation by External Examiner:** The project is assessed by an external expert using predefined rubrics, focusing on technical competence, originality.

B. Project Monitoring and Assessment

The project progress is systematically monitored through three monitoring stages. Each stage evaluates predefined activities such as documentation, literature review, requirement analysis, planning, implementation, and Testing. Progress is assessed using clear parameters (Complete/Incomplete) to ensure timely execution, quality compliance, and readiness for subsequent project phases shown in Table 3.5.2.

Table No.3.5.2: Continuous Monitoring of Project Stage-I (Semester VI)

Monitoring Stage	Activities
Monitoring –I (Project Initiation and Study)	<ul style="list-style-type: none"> • Status of log book up to Monitoring–I • Introduction and problem definition with objectives • Literature review and analysis of existing systems
Monitoring –II (System Design and Partial Implementation)	<ul style="list-style-type: none"> • Status of log book up to Monitoring–II • Designing system block diagram / architecture • Implementation plan for Project Stage–II
Monitoring –III (Implementation, Testing and Documentation)	<ul style="list-style-type: none"> • Status of log book up to Monitoring–III • Partial implementation (20–25%) • Submission of soft copy of Project Stage-I report

Each project is assessed through CA and graded based on project quality and consistent work progress. Table 3.5.3 presents the continuous assessment rubrics for Project Stage-I.

Table No.3.5.3: Continuous Assessment Rubrics for Project Stage-I

Attendance	Logbook Maintain	Literature survey	Depth of Understanding	Report	Total
5	5	5	5	5	25

Final Project demonstration and the report is evaluated by a panel of external examiners. ESE evaluation for Project Stage-I (Semester VI) is structured to assess multiple aspects of the project, as outlined in Table 3.5.4.

Table No.3.5.4: ESE Assessment Rubrics for Project Stage-I

Project Topic Selection	Design / Simulation / Logic	Hardware/ Programming	Result	Presentation	Total
5	5	5	5	5	25

- Project stage–I is continued as Project stage–II in Semester VII, focusing on completing the remaining implementation as per the approved synopsis/abstract.
- Students plan and execute the project systematically to ensure completion within the semester timeline. Table 3.5.5 shows Continuous Monitoring of Project Stage -II (Semester-VII)

Table No.3.5.5: Continuous Monitoring of Project Stage-II (Semester VII)

Monitoring Stage	Activities
Monitoring –I	<ul style="list-style-type: none"> • Verification of log book up to Monitoring–I • System Implementation up to 40%
Monitoring –II	<ul style="list-style-type: none"> • Verification of log book up to Monitoring–II • System Implementation up to 70%
Monitoring –III	<ul style="list-style-type: none"> • Verification of log book up to Monitoring–III • System Implementation 100% • Submission of complete project report

Project stage –II emphasizes design, fabrication, experimentation, testing, data analysis, and documentation. The CA and ESE Assessment Rubrics for Project Stage-II are shown in Table 3.5.6 and Table 3.5.7 respectively.

Table No.3.5.6: Continuous Assessment Rubrics for Project Stage-II

Attendance	Logbook Maintain	Literature survey	Depth of Understanding	Report	Total
5	5	5	5	5	25

Table No.3.5.7: ESE Assessment Rubrics for Project Stage-II

Depth of Understanding	Implementation	Testing	Report	Presentation	Total
05	05	05	05	05	25

- Each group maintains a project log book and submits a hard-bound project report at the end of Semester VII.
- Relevant domain knowledge beyond the core syllabus is applied for effective project implementation.

C.Capstone Project Timeline

A well-defined project timeline ensures systematic planning, timely execution and effective monitoring of Project Stage-I and Stage-II as elaborated in Table 3.5.8 and Table 3.5.9 respectively.

Table No.3.5.8: Timeline for Project Stage -I (Semester-VI)

Sr. No.	Activity	Tentative Period
1	Project registration and submission of three probable topics with abstract	Third week of January
2	Scrutiny, topic finalization, and guide allocation by Head of Department and project coordinator.	Last week of January
3	Introduction, literature review, and requirement analysis	Second week of February
4	Project planning, scheduling	Last week of February
5	Monitoring-I of Project Stage-I	First week of March
6	System design and architecture	Second week of March
7	Implementation plan for Project Stage-II	Third week of March
8	Monitoring-II of Project Stage-I	First week of April
9	Completion of Project Stage-I (30%) with report submission (as per guide approval)	Second week of April
10	Monitoring-III of Project Stage-I	First week of May

Table No.3.5.9: Timeline for Project Stage -II (Semester-VII)

Sr. No.	Activity	Tentative Period
1	System Implementation up to 40%.	Third Week of August
2	Monitoring-I of Project Stage-II	Second week of September
3	System Implementation up to 70%.	Third week of September
4	Monitoring-II of Project Stage-II	Second week of October
5	System Implementation up to 100%.	Last week of October
6	Monitoring-II of Project Stage-II	First week of November
7	Completion of Project Stage-II along with the report in prescribed format by the approval of concerned guide	Third week of November

It facilitates structured progress from topic selection to implementation and evaluation, promotes optimal utilization of time and resources, enhances coordination between students and guides, and supports continuous assessment.

D.Relevance of Project Evaluation Rubrics to POs

The evaluation of student projects is carried out using well-defined rubrics during Project Stage-I and Project Stage-II, ensuring systematic assessment of technical complexity and professional competencies. The rubrics evaluate aspects such as problem identification, literature survey, objective formulation, design methodology, implementation, testing, and documentation, which reflect the complexity, feasibility, cost considerations, environmental relevance, and sustainability of the proposed solution. In addition, the evaluation framework assesses teamwork, communication, and project management practices through parameters such as group collaboration, periodic progress reviews, maintenance of project logbooks, technical report writing, and final project presentations. This structured rubric-based evaluation ensures that students effectively plan, execute, and communicate engineering projects while applying appropriate project management principles and responsible engineering practices.

The Mechanical Engineering Department is committed to contributing toward the achievement of the United Nations Sustainable Development Goals (SDGs) through education, research, innovation and social outreach. Mechanical engineers play a vital role in developing sustainable technologies, optimizing energy use and designing systems that reduce environmental impact.

Faculty members guide students in identifying problem statements relevant to SDGs such as Quality Education, Good Health and Well-being, Clean Water and Sanitation, Affordable and Clean Energy, Sustainable Cities and Communities, and Climate Action.

Students work in teams under the mentorship of faculty members. Project proposals are reviewed to ensure relevance to one or more SDGs. Periodic reviews, demonstrations, and evaluations are conducted to assess technical quality, innovation, and societal impact. These activities align with the following SDGs:

A. Evidence of Addressing Sustainable Development Goals (SDGs) in Mechanical Engineering Department

Table 3.6.1: Evidence of Addressing Sustainable Development Goals (SDGs)

Sr. No.	SDG Goal	Evidence / Departmental Activities
1	<p>SDG 2 – Zero Hunger</p> <p>End hunger, achieve food security and improved nutrition and promote sustainable agriculture.</p>	<ul style="list-style-type: none"> • Under MESA, students organize food distribution drives for school children and tribal communities, promoting food security and community welfare. • Student projects such as Automatic Fertigation System, Automatic Water Valve Control Farming System and Multipurpose Power Weeder Machine supporting smart and sustainable agriculture.
2	<p>SDG 3 – Good Health and Well-being</p> <p>Ensure healthy lives and promote well-being for all at all ages.</p>	<ul style="list-style-type: none"> • Student projects like Smart Helmet, Vibrating Weight Loss Machine focus on health, safety, and personal well-being. • Developed clean water systems, including water purifiers and desalination units, to improve public health. • Students organized tree plantations, blood donation drives, cloth distribution in tribal areas and yoga sessions to promote community health. • The institute collaborated with ISKON to further support health and well-being initiatives.
3	<p>SDG 4 – Quality Education</p> <p>Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.</p>	<ul style="list-style-type: none"> • Implementation of Outcome-Based Education (OBE) through hands-on design and fabrication projects. • The institute runs its academic programs in alignment with NEP, which promotes inclusive, equitable and outcome-based education with an emphasis on skill development, multidisciplinary learning and lifelong learning opportunities for all. • Conduct value-added courses, skill development programs and technical workshops to enhance employability • Strengthening internships, expert lectures and industrial visits. • Exposure to CAD, CAE, simulation, prototyping and experimental investigations through real-world engineering problems.

Sr. No.	SDG Goal	Evidence / Departmental Activities
4	<p>SDG 5 – Gender Equality</p> <p>Achieve gender equality and empower all women and girls.</p>	<ul style="list-style-type: none"> • Equal access to admission, laboratory facilities, projects, internships and evaluations for all students. • Encouragement of female student participation in technical projects, competitions and academic activities.
5	<p>SDG 6– Clean Water and Sanitation</p> <p>Ensure availability of clean water.</p>	<ul style="list-style-type: none"> • Student projects on Development of Thermo syphon Water Purification System, Sea Water Desalination and Purifier Machine and Advanced Water-Cooling Systems.
6	<p>SDG 7 – Affordable and Clean Energy</p> <p>Ensure access to affordable, reliable and sustainable energy.</p>	<ul style="list-style-type: none"> • Student projects on Solar Air Heater, Solar Still, Solar Assisted Thermal Storage and Solar Chargeable Electric Scooter. • Promotion of renewable energy concepts through design, analysis and experimental validation.
7	<p>SDG 8 – Decent Work and Economic Growth</p> <p>Promote sustained, inclusive and sustainable economic growth and productive employment.</p>	<ul style="list-style-type: none"> • Entrepreneurship development initiatives through incubation centers and student startups. • Skill training in CAD/CAM/CAE tools to enhance technical proficiency and employability. • Skill development in manufacturing processes, automation, thermal systems and product design. • Student projects on Industry-relevant projects such as Injection Molding Machine, Pneumatic Press Machine, Design and Fabrication of Electric Forklift and Plastic Recycling Machine enhancing employability.
8	<p>SDG 9 – Industry, Innovation and Infrastructure</p> <p>Build resilient infrastructure and foster innovation.</p>	<ul style="list-style-type: none"> • Faculty and students engaged in patents, publications and product development. • Student participation in national level technical competitions. • Student innovative projects like Hybrid Bike, Electric Forklift and Electric Charging Station.
9	<p>SDG 10 – Reduced Inequalities</p> <p>Reduce inequality within and among countries.</p>	<ul style="list-style-type: none"> • Development of inclusive and low-cost mechanical solutions addressing the needs of underprivileged and rural communities. • Student projects focusing on affordable technologies, appropriate manufacturing methods and accessible engineering solutions to reduce socio-economic disparities.

Sr. No.	SDG Goal	Evidence / Departmental Activities
10	SDG 11 – Sustainable Cities and Communities Make cities inclusive, safe, resilient and sustainable.	<ul style="list-style-type: none"> • Student projects such as automatic number plate parking system, Natural Ventilation System and Advanced Water Cooler contributing to smart and sustainable infrastructure. • Focus on energy efficiency, safety and urban utility systems.
11	SDG 12 – Responsible Consumption and Production Ensure sustainable consumption and production patterns.	<ul style="list-style-type: none"> • Projects-like Design and Development of a Multi-Purpose Plastic Recycling Machine, Energy Harvesting using Piezoelectric Materials encouraging resource efficiency. • Implementation of efficient material usage practices in laboratories and workshops.
12	SDG 13 – Climate Action Take urgent action to combat climate change and its impacts.	<ul style="list-style-type: none"> • Inclusion of course Environmental Studies in the curriculum to create awareness on climate change, carbon reduction, clean mobility and sustainable practices. • Student project on solar energy and inclusion of course Renewable Energy Systems in the curriculum to enhance student understanding of renewable energy concepts.
13	SDG 16 – Peace, Justice and Strong Institutions Promote peaceful and inclusive societies and build effective, accountable institutions.	<ul style="list-style-type: none"> • Student projects and activities promoting secure systems, safety devices and societal well-being.

Table 3.6.2. Project carried out in the session 2023-24

Sr. No.	Project Title	Related SDGs	Link with SDG Goals
1	Design and Fabrication of an IOT based low Cost Ventilator	3, 9	Improves access to affordable healthcare equipment and supports medical innovation.
2	Design and Fabrication of robotic ropeway for effective material handling	8, 9	Enhances industrial productivity and safe material transportation through automation.
3	Hybrid Vehicle (Petrol +CNG)	7, 9, 13	Reduces emissions and promotes cleaner transportation alternatives.
4	Design and Fabrication of Hybrid Bike	7, 9, 11, 13	Supports sustainable urban mobility and energy-efficient transportation.
5	Design and development of Solar Still	6, 7, 12	Provides clean drinking water using renewable solar energy.

Sr. No.	Project Title	Related SDGs	Link with SDG Goals
6	Solar Powered Electric Vehicle Charging Station -Conceptualization and Execution	7, 9, 11, 13	Promotes clean energy infrastructure and supports electric mobility.
7	Design and Fabrication of Solar Assisted Thermal Storage System	7, 9, 13	Enhances renewable energy storage and utilization efficiency.
8	Design and Development of smart mirror using raspberry pi	9, 11	Supports smart living environments through embedded system integration.
9	Sea Water Desalinator and Purifier Machine	6, 7, 12	Ensures access to clean water using sustainable purification technologies.
10	Helmet Cooling using Peltier Module	3, 9	Improves rider comfort and occupational safety through thermal management.
11	Development of Hydrogen Fuel System from Water for Future Vehicles	7, 9, 13	Promotes alternative clean fuels and supports long-term climate action.
12	Performance evaluation of CI engine using fuel doped with metal oxide nanoparticles synthesized using green approach	7, 9, 12, 13	Enhances fuel efficiency and reduces emissions using sustainable material technologies.
13	Development of Smart Helmet Using IOT	3, 9, 11	Improves road safety through real-time monitoring and intelligent alert systems.
14	ANPR Parking System (Automatic Number Plate Recognition System)	9, 11, 16	Enhances smart traffic management and urban governance efficiency.
15	Design and Development of a Multi-Purpose Plastic Recycling Machine	12, 13, 15	Promotes plastic waste recycling and environmental sustainability.
16	Energy Harvesting Using Piezoelectric Material	7, 9, 13	Supports clean energy generation through innovative harvesting techniques.
17	Automatic Pneumatic Bumper and Break Actuation before Collision	3, 9, 11	Enhances vehicle safety and accident prevention mechanisms.
18	Solar Chargeable Electric Scooter	7, 9, 11, 13	Encourages eco-friendly personal transportation using renewable energy.

Sr. No.	Project Title	Related SDGs	Link with SDG Goals
19	Topology optimization of displacement amplification mechanism	9	Improves mechanical efficiency through advanced design optimization.
20	Thermal Analysis of Natural Ventilation System	7, 9, 11, 13	Promotes energy-efficient building design and thermal comfort.
21	Design and fabrication of Electric Forklift	7, 8, 9, 11	Supports clean industrial transport and workplace sustainability.
22	Utilization of Fused Deposition Modelling on the Production of Poly-Lactic Acid (PLA) Bone structures.	3, 9	Advances biomedical manufacturing using sustainable materials.
23	Agriculture Multipurpose Power Weeder Machine	2, 8, 9, 12	Enhances farm productivity and reduces manual labor in agriculture.
24	Spy Drone for Indian Army	9, 16	Supports defense surveillance and national security through advanced technology.
25	Design and fabrication of advanced water cooler	6, 7, 9, 12	Improves access to clean, energy-efficient drinking water solutions.

Table 3.6.3. Project carried out in the session 2024-25

Sr. No.	Project Title	Related SDGs	Link with SDG Goals
1	Thermo syphon Water Purification System	6, 7, 12	Provides clean drinking water using passive heat transfer and renewable energy, promoting water sustainability.
2	Design and Development of Automatic Fertigation System	2, 6, 12	Enhances agricultural productivity by optimizing water and nutrient usage through automation.
3	Design and Analysis of Injection Molding Machine	8, 9, 12	Supports industrial innovation, efficient manufacturing processes and responsible material usage.
4	Mobile Controlled Robot with end effector (Pick and Place)	8, 9	Improves industrial automation, productivity and safety in material handling applications.
5	Development of Smart and Sustainable Cabinet for Farmers	2, 9, 12	Helps farmers store tools and produce efficiently, supporting sustainability and rural innovation.
6	All Weather Protection Shield for Bikers	3, 9, 11	Enhances rider safety and comfort, supporting safer transportation and urban mobility solutions.

Sr. No.	Project Title	Related SDGs	Link with SDG Goals
7	Design and Fabrication of Pneumatic Press Machine	8, 9	Improves manufacturing efficiency and promotes safe, automated industrial operations.
8	Solar Absorption Refrigeration System Using CFD	7, 9, 13	Promotes renewable energy-based cooling systems and supports climate-friendly refrigeration solutions.
9	Automatic Water Valve Control Farming System	2, 6, 12	Optimizes irrigation practices, reduces water wastage and improves sustainable farming operations.
10	Design and Analysis of Double Pass Solar Air Heater with Different Ribs Surfaces	7, 9, 13	Enhances thermal efficiency of solar energy systems and supports clean energy research.
11	Experimental Investigation of Solar Air Heater with Augmented Surface	7, 9, 13	Improves renewable energy utilization through performance enhancement of solar thermal systems.
12	Development of Vibrating Weight loss Machine	3, 9	Supports health and fitness innovation through mechanical design for physical well-being.

B. Published Research Supporting SDGs in Department of Mechanical Engineering

The Department of Mechanical Engineering demonstrates a strong commitment to research that addresses real-world challenges while aligning with key Sustainable Development Goals (SDGs). Faculty and student publications are aligned through research addressing societal, environmental and technological needs mapped to the UN Sustainable Development Goals (SDGs). Projects in machine learning and data analytics support SDG 9 (Industry, Innovation and Infrastructure), agricultural and safety-focused systems contribute to SDG 2 (Zero Hunger) and SDG 3 (Good Health and Well-being), digital public service solutions align with SDG 11 (Sustainable Cities and Communities), while environmental monitoring research supports SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action). These initiatives demonstrate the institution's commitment to sustainable development, innovation and real-world problem solving.

Table 3.6.4: Paper published in the session 2023-24

Paper Title	Name of the Publisher	Student Names	Project Guide	Name of the Journal / Conference	Volume & Issue	SDG Goal
A Review on Design and Fabrication of Forklift Machines	GFs Godavari College of Engineering, Jalgaon.	Thakare Dipak Dhondu	Mr. Sunil V. Yeole	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 9 – Industry, Innovation and Infrastructure
		Shinde Hitesh Indrasing				
		Jaware Harshwardhan Vilas				
Natural Ventilation Using Turbo Ventilators: A Survey	GFs Godavari College of Engineering, Jalgaon.	Rajput Gayatri Suresh	Mr. Manoj R. Patil	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 7 – Affordable and Clean Energy; SDG 13 – Climate Action
		Daf Kiran Gangadhar				
		Patil Pratik Bhaskar				
Design and Development of smart mirror using raspberry pi	GFs Godavari College of Engineering, Jalgaon.	Patil Rushi Gulab	Mr. Anil H. Kumbhar	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 9 – Industry, Innovation and Infrastructure
		Khaire Ganesh Kailas				
		Jadhav Rohit Prabhakar				
Design and Fabrication of Solar Assisted Thermal energy storage system	GFs Godavari College of Engineering, Jalgaon.	Badgujar Rushikesh Arvind	Mr. Bhushan Y. Patil	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 7 – Affordable and Clean Energy; SDG 13 – Climate Action
		Pimpariya Anurag Rajesh				
		Patil Kirti Pravin				
		Patil Yash Suryabhan				
		Suryavanshi Om Nimba				

Paper Title	Name of the Publisher	Student Names	Project Guide	Name of the Journal / Conference	Volume & Issue	SDG Goal
A Comprehensive Review of Agriculture Multipurpose Power Weeder Machines: Design, Performance, and Applications	GFs Godavari College of Engineering, Jalgaon.	Patil Kalpesh Pankaj	Dr. Hemant K. Wagh	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 2 – Zero Hunger; SDG 9 – Industry, Innovation and Infrastructure
		Shukla Shubham Subhash				
		Patil Prathmesh Chandrakant				
		Dhole Sandip Gulabrao				
Spy Drone for Indian Army	GFs Godavari College of Engineering, Jalgaon.	Pawara Bharat Janzadya	Mr. Kapil A. Saner	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 9 – Industry, Innovation and Infrastructure
		Nikam Ganesh Rahul				
		Nhavi Apeksha Anil				
Performance evaluation of CI engine using fuel doped with metal oxide nanoparticles synthesized using green approach	GFs Godavari College of Engineering, Jalgaon.	Patil Vinit Narvirsing	Mr. Kiran D. Chaudhari	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 7 – Affordable and Clean Energy; SDG 13 – Climate Action
		Gujar Kalpesh Prakash				
		Karankal Mrunal Milind				
		Jadhav Darshan Dilip				
Mechanical Characterization of FDM-Fabricated Polylactic Acid Hydroxyapatite Composite Scaffolds for Bone Tissue Engineering Applications	GFs Godavari College of Engineering, Jalgaon.	Mohammad Mujtahid Mohammad Hanif	Mr. Kiran D. Chaudhari	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 3 – Good Health and Well-being; SDG 9 – Industry, Innovation and Infrastructure
		Patil Chetan Anil				
		Prathamesh Vishal Mahajan				
Design and Development of a Low-Cost Multi-Purpose Plastic Recycling Machine for Sustainable Material Recovery	GFs Godavari College of Engineering, Jalgaon.	Marathe Rohit Rajendra	Mr. Pradip D. Jamadar	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 12 – Responsible Consumption and Production; SDG 13 – Climate Action
		Padvi Shubham Soham				
		Chavan Hrushikesh Ajit				
Development of Hydrogen Fuel System from Water for Future Vehicles a Review	GFs Godavari College of Engineering, Jalgaon.	Bhadane Jayesh Ravindra	Mr. Pravin L. Sarode	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 7 – Affordable and Clean Energy; SDG 13 – Climate Action
		Sutar Vishal Dnyaneshwar				
		Dhongade Trunal Purushottamji				
		Thorat Siddharth Kailas				
Development of an IoT-Based Smart Helmet Detection System for Enhanced Two-Wheeler Safety	GFs Godavari College of Engineering, Jalgaon.	Chavan Sagar Vasant	Mr. Rohan R. Ozarkar	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 3 – Good Health and Well-being; SDG 11 – Sustainable Cities and Communities
		Sapkale Vishal Parshuram				
		Nikam Sakshi Sunilrao				
		Darshan Bagul				
Design and Implementation of an ANPR-Based Smart Parking Gate System Integrated with RFID Technology	GFs Godavari College of Engineering, Jalgaon.	Surve Tejal Prashantrao	Mr. Yogesh R. Pathak	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 11 – Sustainable Cities and Communities; SDG 9 – Industry, Innovation and Infrastructure
		Suryawanshi Jayesh Sunil				
		Savale Vishal Sanjay				
Review: Design and Fabrication of Hybrid Bicycles	GFs Godavari College of Engineering, Jalgaon.	Mahure Dhiraj Bhagwan	Mr. Nilesh M. Shinde	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2024) Proceedings	ISBN : 978-81-965128-8-0	SDG 7 – Affordable and Clean Energy; SDG 13 – Climate Action
		Jadhav Sachin Hira				

Table 3.6.5: Paper published in the session 2024-25

Paper/Patent Title	Name of the Publisher	Student Names	Project Guide	Name of the Journal / Conference	Volume & Issue	SDG Goal
Efficient Cargo Booking and Logistics Management System	Copyright office, Govt. of India	Patil Yash Rajendra	Dr. Bhushan Y. Patil	Copyright Certificate	SW-21348/2025-CO	SDG 9 – Industry, Innovation and Infrastructure
		Patole Manish Hitendra	Dr. Hemant K. Wagh			
		Mali Dipak Dnyaneshwar	Dr. Kapil A. Saner			
Smart Flush System	GFs Godavari College of Engineering, Jalgaon.	Patil Chetan Ravindra	Mr. Rohan R. Ozarkar	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN – 978-81-968730-3-5	SDG 6 – Clean Water and Sanitation
		Jadhav Ujwalsing Narendrasing				
		Nikum Pritesh Jitendra				
		Chaudhari Dhananjay Jadhav				
		Patil Yashashri Kamalesh				
Sonawane Tejswini Ramesh						
Smart Flush System	International Journal of Innovations in Engineering and Science	Patil Chetan Ravindra	Mr. Sunil V. Yeole	International Journal of Innovations in Engineering and Science	Vol. 10, No. 9, 2025, PP. 50-53 e-ISSN: 2456-3463	SDG 6 – Clean Water and Sanitation
		Jadhav Ujwalsing Narendrasing				
		Nikum Pritesh Jitendra				
		Chaudhari Dhananjay Jadhav				
		Patil Yashashri Kamalesh				
Sonawane Tejswini Ramesh						
Design and Fabrication of solar assisted absorption refrigeration system using CFD	GFs Godavari College of Engineering, Jalgaon.	Badgular Manish Gopal	Dr. Bhushan Y. Patil	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN : 978-81-968730-3-5	SDG 7 – Affordable and Clean Energy; SDG 13 – Climate Action
		Khairnar Sahil Yuvraj				
		Chaudhari Abhishek Bhatu				
		Badgular Ketan Ravindra				
Automatic Water Valve Control Farming System	GFs Godavari College of Engineering, Jalgaon.	Chaudhari Chetan Anil	Dr. Pravin L. Sarode	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN : 978-81-968730-3-5	SDG 2 – Zero Hunger; SDG 6 – Clean Water and Sanitation
		Pardeshi Virendra Pravinsing				
		Shinde Hitesh Santosh				
		Patil Rajesh Mohan				
Design and Analysis of Injection Molding Machines: A Comprehensive Review	GFs Godavari College of Engineering, Jalgaon.	Patil Gopal Lotan	Dr. Hemant K. Wagh	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN : 978-81-968730-3-5	SDG 9 – Industry, Innovation and Infrastructure; SDG 12 – Responsible Consumption and Production
		Patil Kunal Pravin				
		Koli Ritesh Rohidas				
		Patil Swanand Dilip				
Design and Development of an IOT-Based Auto-matic Fertigation System	GFs Godavari College of Engineering, Jalgaon.	Patil Hemant Dhanraj	Mr. Manoj R. Patil	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN : 978-81-968730-3-5	SDG 2 – Zero Hunger; SDG 6 – Clean Water and Sanitation; SDG 9 – Industry, Innovation and Infrastructure
		Jadhav Shubham Suresh				
		Borse Lalit Rajendra				
		Wagh Yadnyesh Murlidhar				
Thermosyphon Water Purification System: A Review	GFs Godavari College of Engineering, Jalgaon.	Tamkhane Himanshu Motilal	Dr. Pravin L. Sarode	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN : 978-81-968730-3-5	SDG 6 – Clean Water and Sanitation; SDG 3 – Good Health and Well-being
		Ahire Vikrant Pramod				
		Chaudhari Darshan Subhash				
		More Mayur Hemraj				

Paper/Patent Title	Name of the Publisher	Student Names	Project Guide	Name of the Journal / Conference	Volume & Issue	SDG Goal
Design, Structural Analysis, and Performance Evaluation of a Mechanical Whole-Body Vibration (WBV) Platform for Metabolic Augmentation	GFs Godavari College of Engineering, Jalgaon.	Chaudhari Varun Gunwant	Mr. Rohan R. Ozarkar	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN : 978-81-968730-3-5	SDG 3 – Good Health and Well-being; SDG 9 – Industry, Innovation and Infrastructure
		Savant Manish Laxman				
		Chaudhari Hitesh Jitendra				
		Bagal Aaditya Jagdish				
Design and Development of Smart and Sustainable Cabinet for farmers	GFs Godavari College of Engineering, Jalgaon.	Patil Yash Rajendra	Mr. Sunil V. Yeole	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN : 978-81-968730-3-5	SDG 2 – Zero Hunger; SDG 12 – Responsible Consumption and Production
		Patole Manish Hitendra				
		Patil Rohan Mahesh				
		Saindane Jagdish Rajendra				
Design and Analysis of Double Pass Solar Air Heaters with Different Rib Surfaces: A Comprehensive Literature Review	GFs Godavari College of Engineering, Jalgaon.	Mali Dipak Dnyaneshwar	Mr. Nilesh M. Shinde	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN : 978-81-968730-3-5	SDG 7 – Affordable and Clean Energy; SDG 13 – Climate Action
		Patil Divyesh Ravindra				
		Koli Abhishek Ravindra				
Design and Fabrication of a Cost-Effective Compression Molding Machine for Polymer and Composite Applications	GFs Godavari College of Engineering, Jalgaon.	Pardeshi Virendra Pravinsing	Prof. P. D. Jamadar	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	ISBN : 978-81-968730-3-5	SDG 9 – Industry, Innovation and Infrastructure; SDG 12 – Responsible Consumption and Production
		Shinde Hitesh Santosh				
		Bidkar Gaurav Lotan				

C. Student-Led Initiatives for SDG Awareness and Skill Development beyond OBE

The Mechanical Engineering Department promotes Sustainable Development Goals (SDGs) through student-led activities of the Motorsports Club, MESA and Aakrtix Club. These clubs conduct hands-on workshops and project-based activities focused on vehicle design, fabrication, CAD/CAE and sustainable engineering practices. The initiatives support SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure) and SDG 17 (Partnerships for the Goals) by enhancing technical skills, innovation, teamwork and industry readiness among students.

Table 3.6.6: Relevance of Student Activities Supporting the SDG Goals

SDG Goal	How Student Initiatives and Technical Events Support the SDG Goal
SDG 4 – Quality Education	<ul style="list-style-type: none"> Promoted outcome-based and experiential learning through design, analysis, fabrication, and testing of mechanical systems. Conducted hands-on workshops and project activities through Motorsports Club and Aakrtix Club focusing on vehicle design, CAD/CAE, and sustainable engineering practices. Organized technical competitions such as Aero-gliding, Water Rocket Challenge during Converges 2025 to strengthen practical learning.

SDG Goal	How Student Initiatives and Technical Events Support the SDG Goal
SDG 8: Decent Work and Economic Growth	<ul style="list-style-type: none"> • Strengthened employability skills including technical problem-solving, teamwork, project management, time management, and safety awareness. • Prepared students for careers in manufacturing, automotive, aerospace, and design sectors through industry-oriented projects and competitions. • Encouraged leadership, entrepreneurship, and organizational skills through student-led club activities and event management.
SDG 9: Industry, Innovation and Infrastructure	<ul style="list-style-type: none"> • Promoted innovation through design optimization, prototype development, and performance evaluation in student projects and competitions. • Encouraged the use of advanced tools such as CAD/CAE, FEA, and modern design software through Aakrtix Club training and activities. • Organized expert lectures and technical events under Converges to expose students to real-world engineering practices and industrial technologies.
SDG 17: Partnerships for the Goals	<ul style="list-style-type: none"> • Demonstrated collaboration among students, faculty coordinators, clubs, and technical event organizing committees. • Established MoUs with industries and organizations for training, internships, and knowledge exchange. • The institute has initiated the Alma Shine Alumni Portal to connect students with global alumni and industry experts, fostering innovation, mentorship, and industry-ready skills.

3.7.1. Describe the Assessment Tools and Processes Used to Gather the Data for the Evaluation of Course Outcome (5)

Institute Marks : 5.00

The department follows a structured Outcome Based Education (OBE) framework for assessment of Course Outcomes. Both direct and indirect assessment tools are systematically used for theory and laboratory courses to measure students' learning levels and attainment of COs. The assessment process integrates continuous internal evaluation, end semester examinations, as direct assessment tools and course exit survey as indirect assessment tools to ensure comprehensive and reliable CO attainment for record analysis and corrective actions.

A. Direct Assessment Tools and Processes

Direct assessment tools includes internal and external assessment

A.1. Internal Assessment Tools

A.1.1. Internal Assessment Theory (35 Marks)

a. Term Tests (15|10 Marks)

- Two term tests are conducted: Term Test-1 and Term Test-2, each of 30 marks.
- Questions are designed as per Bloom's Taxonomy and mapped to relevant Course Outcomes.

b. Teacher's Assessment (20|25 Marks)

- Continuous evaluation through 3-4 below teacher's assessment tools includes Mock Interview, Presentation (PPT), Group Discussion (GD), Virtual Lab, Moodle Quiz and Innovative Component.
- These activities are planned by the course instructor, aligned with the course syllabus, and mapped to relevant Course Outcomes.
- Evaluation is done using predefined rubrics to ensure uniform and transparent assessment.
- Marks from all components are consolidated and used for internal CO attainment evaluation.

A.1.2. Internal Assessment Laboratory (25|50 Marks)

a. Laboratory Experiment Assessment (15|30 Marks): Continuous evaluation based on experiment performance and viva-voce.

b. Course Specific Case Study / Assignment (10|20 Marks): Evaluates application of laboratory concepts and analytical ability.

A.1.3 Internal Assessment Project (25 Marks): Periodic evaluation of project based on problem identification, literature review, methodology, implementation progress, and interim reviews.

A.1.4 Internal Assessment Internship (150 Marks): Assessment based on internship progress reports, mentor feedback, and periodic reviews.

A.2. External Assessment Tools

A.2.1. External Assessment Theory (65 Marks): A comprehensive written examination (ESE) is conducted at the end of the semester to evaluate overall achievement of Course Outcomes.

A.2.2 External Assessment Laboratory (25|50 Marks): Evaluates students' ability to independently perform experiments, analyze results, and achieve laboratory Course Outcomes.

A.2.3. External Assessment- Project (25 Marks): Final evaluation by a panel based on project implementation, report quality, and viva.

A.2.4. External Assessment- Internship (150 Marks): Evaluation based on completion report, industry mentor assessment, and final presentation/viva.

B. Indirect Assessment Tools and Processes

Course Exit Survey: Collected at the end of the semester to capture students' perception of CO attainment and validate direct assessment results.

C. Summary of Assessment Tools with marks structure: The summary of assessment tools with marks are given in Table 3.7.1.

Table 3.7.1: Summary of Assessment Tools with marks structure

Course Type	Internal Assessment	External Assessment
Theory	35 Marks	65 Marks
Laboratory	25 50 Marks	25 50 Marks
Project	25 Marks	25 Marks
Internship	150 Marks	150 Marks

D. The quality/relevance of assessment tools/processes used

The assessment tools, their processes, and relevance to CO attainment are summarized in Table 3.7.2.

Table 3.7.2: Assessment Tools, Processes and their relevance to CO attainment

Sr. No.	Course Type	Assessment Category	Assessment Tool	Marks	Assessment Process	Relevance to CO Evaluation
Direct Assessment Tools						
1	Theory	Internal	Term Test-1	30 (Scaled to 15 10)	Written test covering part syllabus; CO-mapped questions	Evaluates conceptual understanding and analytical skills
		Internal	Term Test-2	30 (Scaled to 15 10)	Written test covering remaining syllabus; CO-mapped questions	Measures continuity of learning and higher cognitive levels
		Internal	Teacher's Assessment	20 25	Mock Interview, PPT, GD, Virtual Lab, Moodle Test, Innovative Component	Assesses application of concepts, communication skills, teamwork, and professional competencies
		External	End Semester Examination (Theory)	65	Comprehensive written examination covering entire syllabus	Assesses overall attainment of all theory COs
2	Laboratory	Internal	Laboratory Experiment Assessment	15 30	Continuous evaluation of experiment performance and viva-voce	Measures hands-on skills and procedural knowledge
	Laboratory	Internal	Course-Specific Case Study / Assignment	10 20	Application-oriented tasks aligned with lab outcomes	Evaluates analytical and problem-solving ability
	Laboratory	External	End Semester Examination (Lab)	25 50	Practical examination by internal/external examiners	Validates independent experiment execution and lab CO attainment
3	Project	Internal	Internal Assessment Project	25	Periodic reviews and progress assessment	Assesses design, implementation, and problem-solving skills
		External	External Assessment-Project	25	Final presentation and report evaluation	Measures achievement of project-related COs
4	Internship	Internal	Internal Assessment Internship	150	Mentor feedback and progress reports	Evaluates professional skills and practical exposure
		External	External Assessment-Internship	150	Final report and viva	Assesses industry-oriented learning outcomes
Indirect Assessment Tools						
5	Theory and Lab	Indirect	Course Exit Survey	-	Student feedback collected at end of semester	Validates direct CO attainment through student perception

The assessment data obtained from direct and indirect assessment tools are systematically mapped to Course Outcomes and analyzed to determine CO attainment levels, as presented in Section 3.7.2.

3.7.2 Record the Attainment of Course Outcomes of all Courses with Respect to Set Attainment Levels (20)

Institute Marks : 20.00

The department follows a well-defined, transparent, and uniform methodology to determine Course Outcome (CO) attainment levels for all theory and laboratory courses, in alignment with Outcome Based Education (OBE) principles. CO attainment is evaluated using data obtained from direct and indirect assessment tools, as described in Section 3.7.1, and is computed separately for theory and laboratory courses.

A. Course Outcome Attainment methodology

CO attainment is computed through direct and indirect assessment data collected through theory laboratory, project, and internship assessments, followed by calculation of overall CO attainment. Each CO is evaluated based on the percentage of students scoring above the defined threshold value.

B. Calculating CO Attainment– Theory Courses

B.1. CO Attainment through Direct Assessment: Direct CO attainment is computed using internal and external assessment **data** collected through theory courses.

- **CO Attainment Levels and Targets:** The department has defined threshold value of 60% for Internal Assessment and 50% for External Assessment in theory courses for the 2021–22 to 2024-25 batch. Based on these threshold values, the attainment levels are calculated as per the rubrics defined in the table 3.7.3 and 3.7.4.

Table 3.7.3: CO Attainment Levels for Internal Assessment- Theory Courses

CO Attainment Levels for Internal Assessment	
Attainment Level	Criteria
Level 3	More than 80% students scored above Threshold
Level 2	60% to 80% students scored above Threshold
Level 1	Less than 60% students scored above Threshold

Table 3.7.4: CO Attainment Levels for External Assessment- Theory Courses

CO Attainment Levels for External Assessment	
Attainment Level	Criteria
Level 3	More than 70% students scored above Threshold
Level 2	50% to 70% students scored above Threshold
Level 1	Less than 50% students scored above Threshold

- **Calculating Direct CO Attainment for Theory Courses:** The department has assigned 50% weightage to Internal Attainment and 50% to External Attainment. The direct attainment for theory courses is calculated as per the formula given below.

$$\text{Direct Attainment (CO)} = (0.5 \times \text{Internal Attainment}) + (0.5 \times \text{External Attainment})$$

B.2. CO Attainment through Indirect Assessment: Course Exit Form responses collected at the end of the semester from students are analyzed CO-wise, and the indirect CO attainment for theory courses is calculated.

B.3. Overall CO Attainment: The Overall CO attainment for theory courses are calculated as per the formula given below:

$$\text{Overall CO Attainment} = 0.8 \times \text{CO Attainment (Direct)} + 0.2 \times \text{CO Attainment (Indirect)}$$

The process adopted for calculating CO attainment for theory courses using direct and indirect assessment components is illustrated in Figure 3.7.1.

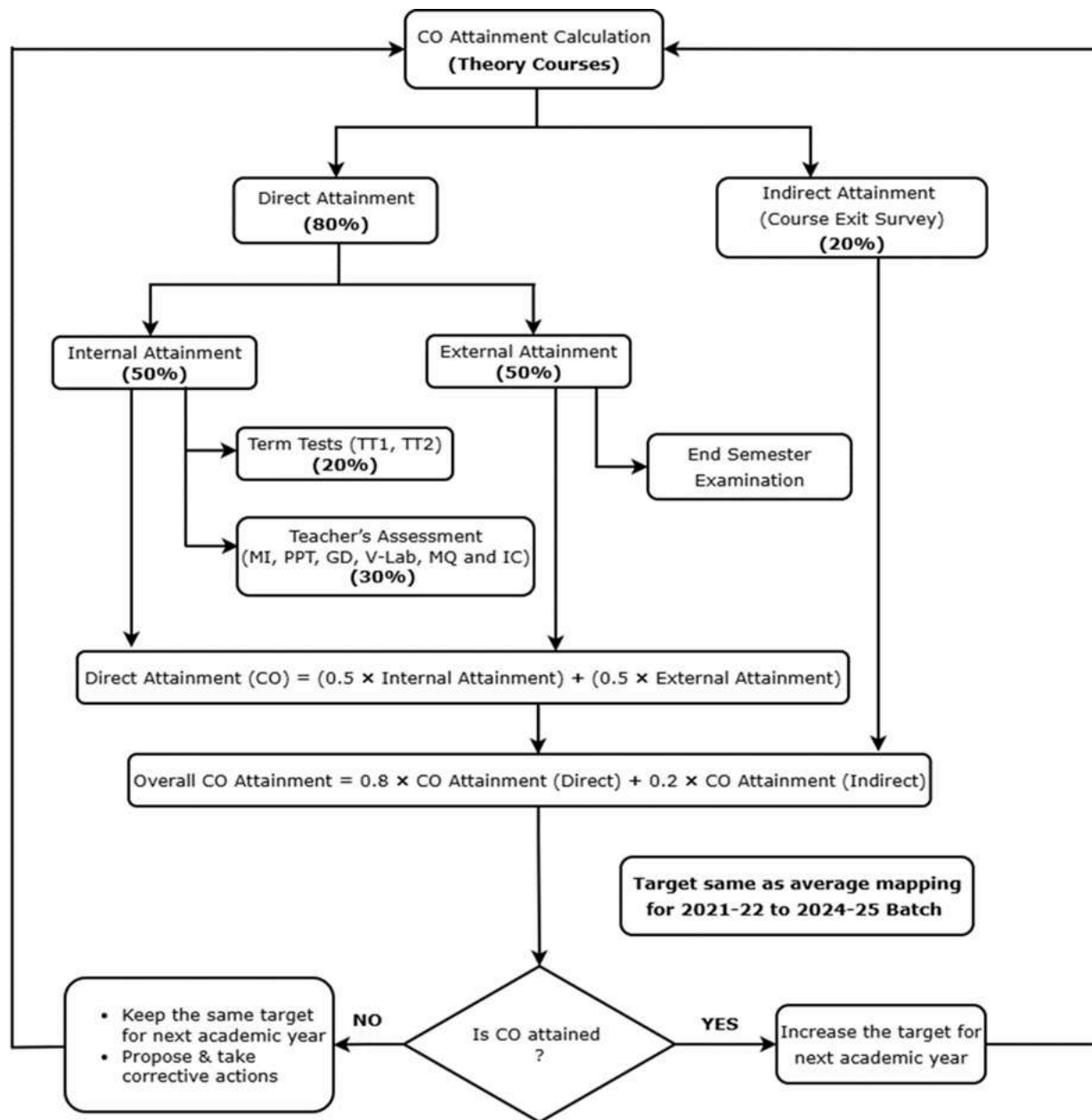


Figure 3.7.1: Course Outcome Attainment calculation Process for Theory Courses

C. Calculating CO Attainment- Laboratory Courses

C.1. CO Attainment through Direct Assessment: Direct CO attainment is computed using internal and external assessment data collected through Laboratory courses (Lab, Project, and Internship)

- **CO Attainment Levels and Targets:** The department has defined threshold value of 70% for Internal Assessment and 60% for External Assessment in laboratory courses for the 2021-22 to 2024-25 batch. Based on these threshold values, the attainment levels are calculated as per the rubrics defined in the table 3.7.5 and 3.7.6.

Table 3.7.5: CO Attainment Levels for Internal Assessment- Laboratory Courses

CO Attainment Levels for Internal Assessment	
Attainment Level	Criteria
Level 3	More than 90% students scored above Threshold
Level 2	70% to 90% students scored above Threshold
Level 1	Less than 70% students scored above Threshold

Table 3.7.6: CO Attainment Levels for External Assessment- Laboratory Courses

CO Attainment Levels for External Assessment	
Attainment Level	Criteria
Level 3	More than 80% students scored above Threshold
Level 2	60% to 80% students scored above Threshold
Level 1	Less than 60% students scored above Threshold

- **Calculating Direct CO Attainment for Laboratory Courses:** The department has assigned 50% weightage to Internal Attainment and 50% to External Attainment. The direct attainment for laboratory courses is calculated as per the formula given below.

$$\text{Direct Attainment (CO)} = (0.5 \times \text{Internal Attainment}) + (0.5 \times \text{External Attainment})$$

C.2. CO Attainment through Indirect Assessment: Course Exit Form responses collected at the end of the semester from students are analyzed CO-wise, and the indirect CO attainment for theory courses is calculated.

C.3. Overall CO Attainment – Laboratory Courses: The Overall CO attainment for laboratory courses are calculated as per the formula given below:

$$\text{Overall CO Attainment} = 0.8 \times \text{CO Attainment (Direct)} + 0.2 \times \text{CO Attainment (Indirect)}$$

The process followed for calculating CO attainment for laboratory courses using direct and indirect assessment components is shown in Figure 3.7.2.

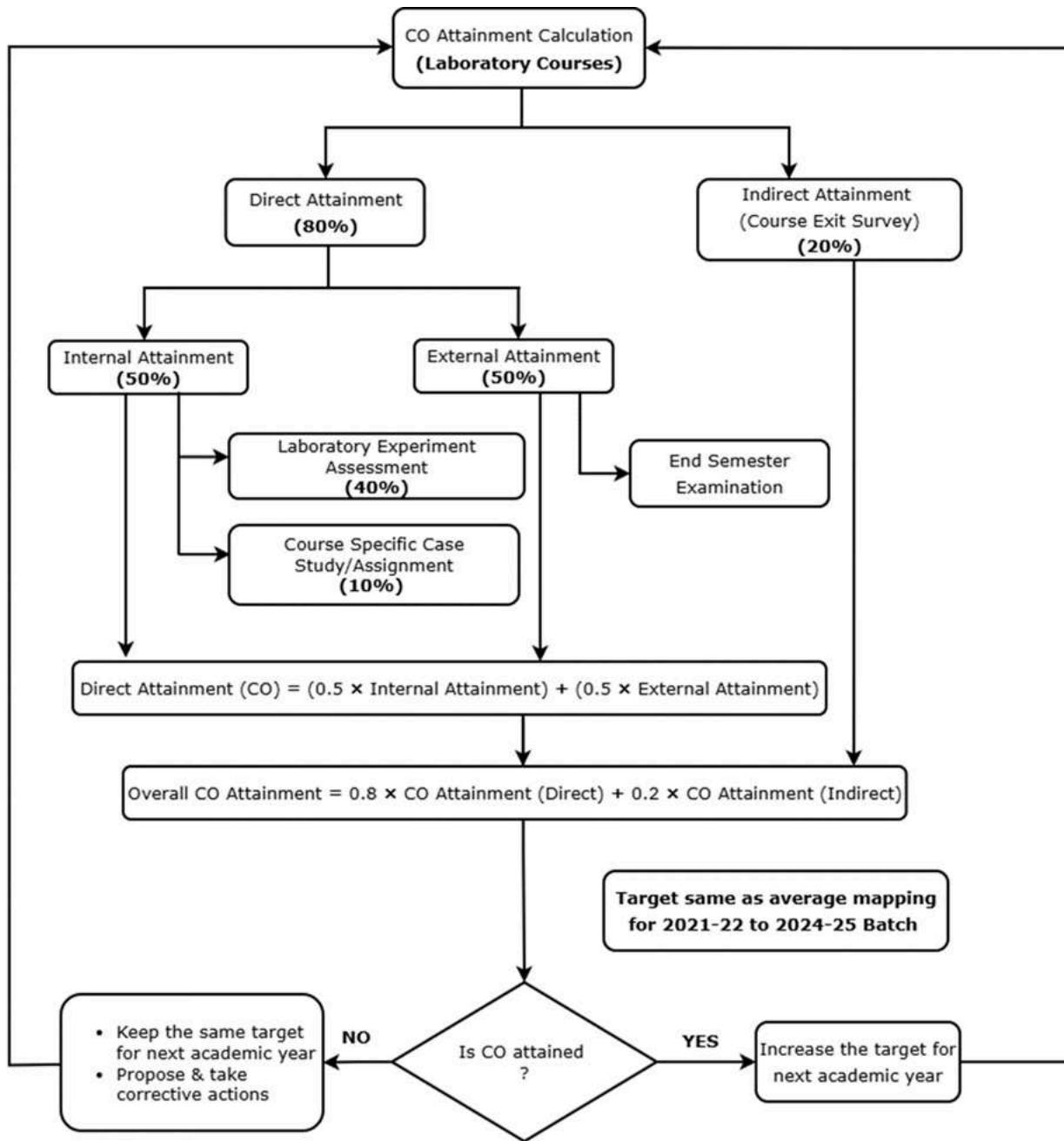


Figure 3.7.2: Course Outcome Attainment calculation Process for Laboratory Courses

D. Review and Verification of CO Attainment

- CO attainment levels are computed and documented for all theory and laboratory courses.
- The attainment results are reviewed by the Course Committee and Department Advisory Committee.
- Calculations are verified using internal assessment records, end semester examination results, and indirect student survey data.

E. Course Wise CO Attainment for Batch 2021-22 to 2024-25

Table 3.7.7: Course Wise CO Attainment for Batch 2021-2022 to 2024-25

Course	CO1	CO2	CO3	CO4	CO5	CO6
C101	1.39	1.20	1.22	1.37	1.38	1.37
C102	1.54	1.53	1.52	1.54		
C103	1.65	1.65	1.73	1.65		
C104	1.60	1.60	1.59	1.56	1.39	1.39
C105	1.86	1.87	1.85	1.84	1.69	
C106	2.34	2.25	2.41	2.01		
C107	2.60	2.26	2.25	1.60	1.64	2.56
C108	2.18	2.19	2.17	1.84	1.85	
C109	2.16	2.17	2.15	2.15	2.17	
C110	1.37	1.38	1.38	1.53	1.53	1.53
C111	1.38	1.37	1.41	1.38		
C112	1.37	1.36	1.38	1.37		
C113	1.29	1.43	1.46	1.29	1.46	
C114	1.54	1.53	1.61	1.53	1.21	1.22
C115	1.35	1.33	1.33	1.35	1.32	1.31
C116	2.18	2.17	2.17	1.85		
C117	2.57	2.55	2.58	1.61	1.62	
C118	1.70	1.69	1.69	1.69	1.69	1.70
C119	2.47	2.77	2.45	2.47	2.44	
C120	1.06	1.07	1.05	1.05	1.07	
C201	1.71	1.70	1.52	1.54	1.92	
C202	1.93	1.85	1.86	1.86	1.67	
C203	1.94	1.86	2.00	2.08	1.70	0.57
C204	2.18	2.34	2.16	1.84	1.86	1.85
C205	1.86	1.82	1.85	1.86	1.70	
C206	1.88	1.78	1.88	1.88	1.72	
C207	1.80	1.70	1.80	1.80	1.80	
C208	2.73	2.75	2.74	2.72	2.75	2.72
C209	2.96	2.96	2.02	2.03		
C210	3.00	2.97	2.97	2.99	2.97	
C211	1.69	1.53	1.54	1.79	1.70	
C212	1.61	1.60	1.59	1.62	1.41	1.45
C213	2.81	2.80	2.79	1.86	1.81	1.85
C214	2.06	2.04	2.22	2.28	2.20	
C215	1.98	2.92	2.94	1.96	2.92	
C216	2.34	2.21	2.38	2.36	2.06	

Course	CO1	CO2	CO3	CO4	CO5	CO6
C217	1.47	1.63	1.60	1.77	1.62	
C218	2.17	2.16	2.20	2.16	1.22	
C219	2.81	2.82	2.81			
C220	1.46	1.42	1.51	1.53		
C221	2.57	2.57	2.57	2.57	2.60	
C222	0.88	0.86	0.92	0.90	0.88	0.86
C301	2.00	1.85	1.93	1.76	1.61	
C302	2.88	2.89	1.93	1.92	0.57	
C303	1.69	1.70	1.77	1.71		
C304	2.81	2.82	2.81	2.83		
C305	1.72	1.71	1.73	1.72	1.56	
C306	2.84	2.83	2.85	1.88	1.88	
C307	2.58	2.53	2.53	2.65	2.42	2.39
C308	2.90	2.53	2.71	1.93	1.94	1.91
C309	2.35	2.06	2.20	2.14	2.39	1.89
C310	2.98	2.99	2.97	2.96		
C311	2.98	2.96	2.97	2.98	2.96	2.99
C312	2.97	2.99	2.97	2.96	2.98	
C313	0.88	0.90	0.87	0.90		
C314	1.46	1.34	1.52	1.46	1.17	
C315	2.90	2.94	2.96	1.94	1.97	
C316	1.68	1.69	1.65	1.67	1.52	
C317	2.16	2.17	2.13	2.15	2.16	
C318	1.90	1.66	1.90	1.74	1.50	1.50
C319	2.95	2.95	2.93	2.00	1.98	1.98
C320	1.85	1.79	1.70	1.82	1.53	
C321	2.17	2.19	1.86	2.14	2.17	
C322	1.85	1.78	1.78			
C323	2.64	2.63	2.68	2.66	2.63	
C324	2.97	2.99	2.96	2.96	2.97	
C401	1.79	1.79	1.99	1.62	1.78	1.78
C402	2.99	2.99	2.99	2.98	2.98	2.98
C403	2.11	2.01	1.86	1.85	1.67	1.71
C404	2.99	2.97	2.98	2.97	2.95	2.99
C405	1.85	1.94	1.76	1.74	1.58	
C406	2.57	2.54	2.56	2.66	2.41	
C407	2.96	2.96	2.98	3.00	2.99	
C408	2.48	2.51	2.65	2.62	2.29	2.34

Course	CO1	CO2	CO3	CO4	CO5	CO6
C409	2.57	2.51	2.72	2.73	2.31	
C410	2.96	2.98	2.96	3.00	2.96	

F. CO Attainment Calculation Sheet

Department of Mechanical Engineering Academic Year 2023-2024 PO ATTAINMENT			Program TY B.Tech Mechanical		Course Name Automotive Prime Movers		Course Code PCM3010T		SEMESTER V		YEAR 2023-24		NAME OF FACULTY KDC									
ASSESSMENT TOOLS			TT-1				TT-2				PPT		GD		IC		ESE					
FULL MARK			Q1	Q2	Q3	Q4	TOTAL	Q1	Q2	Q3	Q4	TOTAL	5	10	5	10	5	10	5	10	5	10
Threshold- 60% for IA, and 50% for ESE			3	6	3	6	18	3	6	3	6	18	3	6	3	6	3	6	3	6	3	6
Sl. No	Name of the Student	Roll No	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks
42	CHALCHALI ABHISHEK BHATU	221203016	5	3	0	4	24	0	0	0	10	10	5	5	5	9	5	5	5	9	5	13
43	BADGUJAR HARSHAL RAVINDRA	221203017	4	3	0	4	18	5	0	7	2	14	4	4	4	9	4	4	4	9	4	11
44	GORAD NAYAN MAHENDRA	221203018	5	4	0	9	18	5	7	0	6	18	5	4	4	9	5	4	4	9	5	21
45	SORAWANE LAVKESH SUBHASHI	221203019	5	9	0	5	19	0	6	4	0	10	5	4	4	9	5	4	4	9	5	17
46	PATIL PRASHANT KHUSHAL	221203020	4	9	2	5	20	2	5	0	0	7	3	1	1	9	3	1	1	9	3	23
CO MAPPED			CO-1	CO-2	CO-3	CO-4	ALL	CO-3	CO-3	CO-4	CO-4	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL
Total Number of Students Appeared			45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Total Number of Students above Threshold			42	34	23	32	37	30	29	21	17	19	30	38	45	0	45	45	45	45	45	2
Percentage			93.33	75.56	51.11	71.11	82.22	66.67	64.44	46.67	37.78	42.22	66.67	84.44	100.00	#DN/0!	#DN/0!	#DN/0!	#DN/0!	#DN/0!	#DN/0!	4.44
Level			3	2	1	2	3	2	2	1	1	1	2	3	3	3	3	3	3	3	3	1
Weightage			20				20				10		10		10		50					
CO-CONTINUOUS ASSESSMENT TOOLS AND CO-ATTAINMENT			Course Outcome	TT-1	TT-2	Final TT	PPT	GD	IC	ESE	CO-Direct	Course Exit Survey-Indirect	Overall CO Attainment									
CO-1	2.50			2.50	2.00	3.00	3.00			1.00	1.80	2.80	2.00									
CO-2	1.50			1.50	2.00	3.00	3.00			1.00	1.60	2.86	1.85									
CO-3		2.00		2.00	2.00	3.00	3.00			1.00	1.70	2.86	1.93									
CO-4			1.00	1.00	2.00	3.00	3.00			1.00	1.50	2.82	1.76									
CO-5					2.00	3.00	3.00			1.00	1.30	2.84	1.61									
Overall CO Attainment [Direct+Indirect]			COURSE CODE	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6	CO-7	CO-8	CO-9	CO-10									
			C301	2.00	1.85	1.93	1.76	1.61														

Figure 3.7.3: CO Attainment Calculation Sample Sheet-Theory Course

Department of Mechanical Engineering Academic Year 2023-2024 PO ATTAINMENT			Program TY B.Tech Mechanical		Course Name Automotive Prime Movers Laboratory		Course Code PCM3010L		SEMESTER V		YEAR 2023-24		NAME OF FACULTY KDC								
ASSESSMENT TOOLS			EXP-1	EXP-2	EXP-3	EXP-4	EXP-5	EXP-6	EXP-7	EXP-8	EXP-9	EXP-10	EXP-11	EXP-12	EXP-13	EXP-14	EXP-15	CASE STUDY	ESE		
FULL MARK			15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	10	10		
Threshold- 75% for IA, and 60% for ESE			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	7	6		
Sl. No	Name of the Student	Roll No	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks	Marks			
40	JADAVY SHUBHAM SUNESH	221203014	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	20			
41	BORISE LALIT RAJENDRA	221203015	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	21			
42	CHALCHALI ABHISHEK BHATU	221203016	11	11	11	11	11	11	11	11	11	11	11	11	11	11	8	19			
43	BADGUJAR HARSHAL RAVINDRA	221203017	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	19			
44	GORAD NAYAN MAHENDRA	221203018	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	20			
45	SORAWANE LAVKESH SUBHASHI	221203019	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	19			
46	PATIL PRASHANT KHUSHAL	221203020	11	11	11	11	11	11	11	11	11	11	11	11	11	11	7	19			
CO MAPPED			CO-1	CO-2	CO-3	CO-4	CO-5	CO-6	CO-7	CO-8	CO-9	CO-10	CO-11	CO-12	CO-13	CO-14	CO-15	ALL	ALL		
Total Number of Students Appeared			45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45		
Total Number of Students above Threshold			43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	38	48		
Percentage			95.56	95.56	95.56	95.56	95.56	95.56	95.56	95.56	95.56	95.56	95.56	95.56	95.56	95.56	84.44	100.00			
Level			3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3			
CO-CONTINUOUS ASSESSMENT TOOLS AND CO-ATTAINMENT			Course Outcome	EXP-1	EXP-2	EXP-3	EXP-4	EXP-5	EXP-6	EXP-7	EXP-8	EXP-9	EXP-10	EXP-11	EXP-12	EXP-13	EXP-14	EXP-15	CASE STUDY	ESE	
CO-1	3.00	2.00	3.00																		
CO-2	3.00	2.00	3.00																		
CO-3		2.00	3.00																		
CO-4			2.00	3.00																	
CO-5					0.0																
Overall CO Attainment [Direct+Indirect]			COURSE CODE	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6	CO-7	CO-8	CO-9	CO-10	CO-11	CO-12	CO-13	CO-14	CO-15	CASE STUDY	ESE	
			C301	2.88	2.89	1.93	1.82	0.87													

Figure 3.7.4: CO Attainment Calculation Sample Sheet-Lab Course

G. Corrective Actions and Continuous Improvement

- Course Outcomes with attainment levels below the desired benchmark are identified.
- Corrective actions such as remedial classes, additional tutorials, revision sessions, and refinement of assessment strategies are implemented in the subsequent academic cycle.
- The effectiveness of these actions is reviewed in the next cycle of CO attainment analysis.

3.8 Attainment of Program Outcomes and Program Specific Outcomes (25)

Total Marks 25.00

PO Attainment

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C101	0.93	0.62	PO3	0.37	0.33	PO6	PO7	PO8	PO9	PO10	PO11	0.31
C102	0.80	0.40	0.40	0.40	0.40	PO6	0.60	PO8	0.40	0.50	PO11	PO12
C103	0.80	1.03	0.47	0.45	0.45	0.93	1.16	0.90	PO9	0.46	0.47	1.40
C104	1.18	0.79	0.39	0.60	0.42	PO6	PO7	PO8	0.42	0.39	PO11	0.39
C105	1.04	1.37	0.52	0.84	1.60	1.04	1.04	1.04	0.52	0.52	PO11	1.56
C106	1.32	1.11	0.65	0.63	0.73	0.63	1.37	0.53	0.40	0.80	0.32	0.95
C107	1.97	1.31	0.66	1.03	0.74	PO6	PO7	PO8	0.74	0.66	PO11	0.66
C108	1.23	1.63	0.61	0.99	1.87	1.23	1.23	1.23	0.61	0.61	PO11	1.84
C109	0.67	0.67	0.67	0.67	0.67	PO6	PO7	PO8	1.00	0.93	PO11	0.67
C110	1.10	0.73	PO3	0.45	0.40	PO6	PO7	PO8	PO9	PO10	PO11	0.37
C111	0.76	0.34	0.33	0.34	0.33	PO6	PO7	PO8	PO9	0.60	0.34	0.35
C112	0.58	0.42	0.33	0.33	PO5	0.67	0.67	PO8	PO9	0.67	PO11	PO12
C113	0.68	0.49	0.49	0.53	0.53	PO6	0.37	0.37	0.37	0.62	0.37	0.73
C114	0.36	0.36	0.68	PO4	0.36	PO6	PO7	PO8	PO9	PO10	PO11	0.36
C115	PO1	0.33	0.33	0.33	PO5	PO6	PO7	PO8	0.33	0.33	PO11	0.33
C116	1.27	0.70	0.60	0.63	0.31	0.67	0.67	PO8	PO9	1.18	0.31	0.33
C117	1.35	0.85	0.85	0.85	0.85	PO6	0.43	0.43	0.43	1.18	0.43	0.87
C118	0.47	0.47	0.93	PO4	0.47	PO6	PO7	PO8	PO9	PO10	PO11	0.47
C119	PO1	0.80	0.80	0.80	PO5	PO6	PO7	PO8	0.84	0.82	PO11	0.80
C201	1.37	0.88	PO3	1.11	PO5	PO6	PO7	PO8	PO9	PO10	PO11	0.46
C202	1.58	0.83	0.53	1.53	PO5	1.65	1.65	PO8	0.75	1.70	PO11	1.17
C203	1.48	0.87	0.62	0.63	0.47	1.23	PO7	PO8	PO9	0.53	PO11	0.47
C204	1.62	1.03	0.58	0.53	0.53	1.16	0.53	0.53	PO9	0.64	PO11	0.53
C205	1.56	0.72	0.51	0.52	0.50	PO6	0.93	PO8	0.53	0.53	PO11	0.53
C206	1.24	0.52	0.51	0.53	PO5	1.07	0.47	PO8	0.53	0.53	PO11	0.53
C207	1.20	0.50	0.50	0.50	PO5	1.00	0.50	PO8	0.50	0.50	PO11	0.50
C208	1.50	0.90	0.90	0.90	1.80	PO6	0.90	PO8	0.90	0.90	PO11	0.90
C209	1.60	1.60	1.60	0.80	0.80	2.40	1.60	2.40	2.40	0.80	0.80	1.60
C210	2.50	2.00	1.00	2.00	1.00	2.00	2.00	3.00	2.00	1.67	1.00	2.00
C211	1.35	1.25	PO3	1.00	PO5	PO6	PO7	PO8	PO9	PO10	PO11	0.45
C212	0.96	0.81	0.40	0.40	PO5	PO6	1.10	PO8	PO9	PO10	PO11	PO12

C213	1.71	1.40	0.63	0.63	PO5	PO6	1.60	PO8	PO9	PO10	PO11	PO12
C214	1.91	1.51	0.68	0.71	0.69	PO6	PO7	PO8	0.69	0.71	PO11	0.68
C215	2.40	1.80	0.84	0.87	0.90	PO6	PO7	PO8	0.80	0.87	PO11	0.84
C216	2.01	1.73	0.90	1.11	0.92	2.25	1.16	PO8	PO9	0.71	PO11	1.24
C217	1.30	0.94	0.47	0.43	0.47	PO6	PO7	0.43	0.43	0.43	PO11	0.43
C218	1.76	1.31	0.47	0.57	0.67	PO6	PO7	0.27	0.59	0.59	PO11	0.67
C219	2.80	1.24	2.80	1.87	1.56	PO6	PO7	1.87	2.80	2.18	PO11	1.24
C220	PO1	PO2	PO3	PO4	PO5	1.15	0.95	1.15	0.76	0.38	0.40	0.48
C221	2.08	1.67	0.83	1.67	0.83	1.67	1.67	2.50	1.67	1.39	0.83	1.67
C222	0.20	0.13	0.13	0.13	0.13	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C301	1.58	0.54	0.53	0.53	0.53	1.05	1.15	1.00	0.50	1.00	0.53	0.53
C302	2.30	0.83	0.77	0.77	0.77	1.53	1.13	1.13	0.57	1.13	0.77	0.77
C303	1.43	1.43	0.48	0.48	0.48	1.45	1.45	0.95	0.95	0.95	0.48	0.48
C304	2.80	2.80	0.93	0.93	0.93	2.80	2.80	1.87	1.87	1.87	0.93	0.93
C305	1.29	0.89	0.50	0.79	0.50	1.00	0.50	1.00	0.75	0.75	PO11	0.89
C306	2.19	1.58	0.83	1.39	0.97	1.93	0.97	1.93	1.45	1.35	PO11	1.58
C307	2.45	1.57	2.50	1.18	1.21	PO6	PO7	1.67	2.45	0.82	PO11	0.82
C308	2.20	1.30	2.73	1.04	1.08	PO6	PO7	1.82	2.20	0.73	PO11	0.73
C309	1.82	1.16	1.53	0.72	1.33	1.33	1.16	PO8	0.72	0.67	PO11	0.67
C310	1.25	1.00	1.00	1.00	2.25	PO6	PO7	PO8	1.00	1.00	PO11	PO12
C311	PO1	1.00	1.00	1.00	PO5	PO6	PO7	2.50	1.00	1.20	PO11	PO12
C312	2.67	1.67	1.00	1.00	1.00	PO6	PO7	PO8	2.33	1.50	1.00	1.00
C313	0.18	0.13	0.13	0.13	0.13	PO6	PO7	PO8	PO9	0.13	PO11	PO12
C314	0.36	0.36	0.49	0.38	0.38	0.89	PO7	PO8	PO9	0.36	PO11	PO12
C315	0.84	0.73	1.24	1.00	0.87	2.07	PO7	PO8	PO9	0.73	PO11	PO12
C316	1.36	1.01	0.57	0.55	0.78	1.23	0.90	1.35	1.30	0.99	0.67	0.67
C317	2.00	1.47	0.83	0.80	1.17	1.83	1.33	2.00	2.00	1.47	1.00	1.00
C318	1.38	0.64	0.48	0.47	0.55	0.90	0.64	PO8	0.46	0.48	0.45	0.47
C319	2.30	1.07	0.80	0.76	0.88	1.20	1.07	PO8	0.73	0.80	0.60	0.76
C320	1.46	1.08	0.49	0.97	PO5	1.07	0.59	0.70	1.46	0.49	PO11	0.49
C321	1.92	1.41	0.64	1.28	PO5	1.33	0.77	0.91	1.92	0.64	PO11	0.64
C322	0.87	0.51	0.50	PO4	PO5	PO6	0.50	PO8	0.51	0.51	PO11	PO12
C323	1.37	1.20	0.86	PO4	1.89	PO6	PO7	PO8	PO9	0.86	PO11	0.86

C324	2.50	2.00	1.00	2.00	1.00	2.00	2.00	3.00	2.00	1.67	1.00	2.00
C401	1.33	1.15	1.45	1.20	1.20	1.01	0.93	0.50	0.48	0.48	0.48	0.48
C402	2.67	2.33	3.00	2.50	2.50	2.00	2.00	1.00	1.00	1.00	1.00	1.00
C403	1.62	1.62	1.62	1.41	1.40	PO6	PO7	0.54	1.40	1.40	PO11	1.40
C404	3.00	3.00	3.00	2.67	3.00	PO6	PO7	1.00	3.00	3.00	PO11	3.00
C405	1.33	0.91	0.89	0.80	0.50	0.98	0.91	0.50	0.61	0.61	PO11	0.88
C406	1.68	1.12	0.80	1.28	1.73	PO6	PO7	2.30	PO9	1.02	PO11	1.20
C407	3.00	1.50	1.50	1.00	1.50	3.00	3.00	3.00	3.00	1.00	1.00	1.00
C408	2.00	0.92	1.72	0.80	1.44	1.57	1.18	0.78	0.80	0.80	0.82	1.60
C409	2.50	2.34	0.90	0.84	PO5	PO6	PO7	PO8	PO9	PO10	2.70	1.67
C410	2.50	1.00	PO3	1.00	PO5	PO6	1.00	3.00	1.50	3.00	PO11	1.00
C120	0.60	0.60	0.40	0.36	0.20	PO6	0.20	PO8	0.20	0.20	0.20	0.40

PO Attainment Indirect

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Program Exit	2.86	2.78	2.35	2.20	2.36	2.84	2.64	2.64	2.24	2.16	1.98	2.10

PO Attainment Level

Note: The Institution can fix the weightage of the indirect attainment maximum up to 20%.

Define the Weightage for Indirect Attainment: 20.00

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Direct Attainment	1.55	1.09	0.88	0.87	0.91	1.43	1.11	1.38	1.10	0.91	0.73	0.89
InDirect Attainment	2.86	2.78	2.35	2.20	2.36	2.84	2.64	2.64	2.24	2.16	1.98	2.10
Overall Attainment	1.81	1.43	1.17	1.14	1.2	1.71	1.42	1.63	1.33	1.16	0.98	1.13

PSO Attainment

Course	PSO1	PSO2
C101	0.31	PSO2
C102	0.40	0.40
C103	PSO1	0.47
C104	0.39	0.39
C105	PSO1	0.52
C106	0.36	0.72
C107	0.66	0.66

C108	PSO1	0.61
C109	0.67	1.33
C110	0.37	PSO2
C111	PSO1	0.34
C112	PSO1	0.33
C113	0.41	0.41
C114	PSO1	0.33
C115	0.33	0.33
C116	PSO1	0.65
C117	0.76	0.76
C118	PSO1	0.47
C119	0.80	0.80
C201	0.46	PSO2
C202	0.53	1.65
C203	0.56	0.56
C204	0.70	0.60
C205	0.52	0.51
C206	0.52	0.53
C207	0.50	0.50
C208	0.90	0.90
C209	1.60	2.40
C210	1.00	1.00
C211	0.45	PSO2
C212	0.41	0.41
C213	0.73	0.73
C214	0.68	0.68
C215	0.84	0.84
C216	0.85	0.71
C217	0.43	0.43
C218	0.59	0.59
C219	1.24	2.18
C220	0.40	0.48
C221	0.83	0.83
C222	0.13	PSO2
C301	0.71	0.63

C302	0.91	0.91
C303	0.96	0.96
C304	1.87	1.87
C305	0.49	0.50
C306	0.81	0.97
C307	0.82	0.82
C308	0.73	0.73
C309	0.92	1.26
C310	1.00	1.00
C311	PSO1	1.00
C312	1.00	1.00
C313	0.13	PSO2
C314	0.44	0.36
C315	0.96	0.84
C316	0.64	1.00
C317	0.93	1.50
C318	0.48	0.48
C319	0.80	0.80
C320	0.49	1.46
C321	0.64	1.92
C322	0.51	0.50
C323	0.86	0.86
C324	1.00	1.00
C401	1.15	0.48
C402	2.33	1.00
C403	1.32	1.16
C404	2.50	2.17
C405	0.91	0.81
C406	0.85	0.83
C407	2.50	1.00
C408	1.33	1.48
C409	1.19	0.90
C410	1.00	1.00
C120	0.52	0.60

PSO Attainment Indirect

Survey	PSO1	PSO2
Program Exit Survey	2.14	2.12

PSO Attainment Level

Course	PSO1	PSO2
Direct Attainment	0.81	0.86
InDirect Attainment	2.14	2.12
Overall Attainment	1.08	1.11

4 STUDENTS' PERFORMANCE (120)

Total Marks 80.44

Table No. 4A: Admission details for the program excluding those admitted through multiple entry and exit points.

Item (Information to be provided cumulatively for all the shifts with explicit headings, wherever applicable)	2025-26 (CAY)	2024-25 (CAYm1)	2023-24 (CAYm2)	2022-23 (CAYm3)	2021-22 (CAYm4)	2020-21 (CAYm5)	2019-20 (CAYm6)
N=Sanctioned intake of the program (as per AICTE /Competent authority)	60	60	60	60	60	120	180
N1=Total no. of students admitted in the 1st year minus the no. of students, who migrated to other programs/ institutions plus no. of students, who migrated to this program	59	56	53	60	55	44	70
N2=Number of students admitted in 2nd year in the same batch via lateral entry including leftover seats	0	13	7	12	19	77	43
N3=Separate division if any	0	0	0	0	0	0	0
N4=Total no. of students admitted in the 1st year via all supernumerary quotas	3	3	3	3	0	4	6

Total number of students admitted in the program (N1 + N2 + N3 + N4) - excluding those admitted through multiple entry and exit points.	62	72	63	75	74	125	119
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Table No. 4B: Admission details for the program through multiple entry and exit points.

	Item (No. of students admitted/exited through multiple entry and exit points) in the respective batch	2025-26 (CAY)	2024-25 (CAYm1)	2023-24 (CAYm2)	2022-23 (CAYm3)	2021-22 (LYG)	2020-21 (LYGm1)	2019-20 (LYGm2)
N52=No. of students admitted in 2nd year via multiple entry and exit points in same batch	N52=No. of students admitted in 2nd year via multiple entry and exit points in same batch	0	0	0	0	0	0	0
N53=No. of students admitted in 3rd year via multiple entry and exit points in same batch	N53=No. of students admitted in 3rd year via multiple entry and exit points in same batch	0	0	0	0	0	0	0
N54=No. of students admitted in 4th year via multiple entry and exit points in same batch	N54=No. of students admitted in 4th year via multiple entry and exit points in same batch	0	0	0	0	0	0	0
N5=N52+N53+N54	N5=N52+N53+N54	0	0	0	0	0	0	0
N61=No. of students exits after 1st year via multiple entry and exit points in same batch	N61=No. of students exits after 1st year via multiple entry and exit points in same batch	0	0	0	0	0	0	0
N62=No. of students exit after 2nd year via multiple entry and exit points	N62=No. of students exit after 2nd year via multiple entry and exit points	0	0	0	0	0	0	0
N63=No. of students exit after 3rd year via multiple entry and exit points in same batch	N63=No. of students exit after 3rd year via multiple entry and exit points in same batch	0	0	0	0	0	0	0
N6=N61+N62+N63	N6=N61+N62+N63	0	0	0	0	0	0	0

Table No. 4C: No. of students graduated within the stipulated period of the program.

Year of entry	Total no. of students (N1 + N2 + N3+ N4 + N5 - N6 as defined above)	Number of students who have successfully graduated in stipulated period of study) [Total of with Backlog + without Backlog]			
		I year	II year	III year	IV year
2025-26 (CAY)	62				
2024-25 (CAYm1)	72	49			
2023-24 (CAYm2)	63	40	44		
2022-23 (CAYm3)	75	47	52	49	
2021-22 (LYG)	74	26	45	44	40
2020-21 (LYGm1)	125	44	112	92	74
2019-20 (LYGm2)	119	74	117	117	105

4.1 Enrolment Ratio (20)

Total Marks 20.00

Institute Marks : 20.00

[Get Details from Table 4.1](#)

Table No.4.1.1: Student enrolment ratio in the 1st year.

Year of entry	N (From Table 4.1)	N1 (From Table 4.1)	N4 (From Table 4.1)	Enrollment Ratio [(N1/N)*100]
2025-26 (CAY)	60	59	3	103.33
2024-25 (CAYm1)	60	56	3	98.33
2023-24 (CAYm2)	60	53	3	93.33

Average [(ER1 + ER2 + ER3) / 3] = 98.33 \approx 20.00

Assessment : 20.00

4.2 Success Rate of the Students in the Stipulated Period of the Program (15)

Total Marks 6.76

Institute Marks : 6.76

Table No.4.2.1: The success rate in the stipulated period of a program.

Item	(2021-22) LYG	(2020-21) LYGm1	(2019-20) LYGm2
A*=(No. of students admitted in the 1st year of that batch and those actually admitted in the 2nd year via lateral entry, plus the number of students admitted through multiple entry (if any) and separate division if applicable, minus the number of students who exited through multiple entry (if any).	79.00	197.00	223.00
B=No. of students who graduated from the program in the stipulated course duration	40.00	74.00	105.00
Success Rate (SR)= (B/A) * 100	50.63	37.56	47.09

Average SR of three batches ((SR_1+ SR_2+ SR_3)/3): 45.09

SR Points : 6.76

Note *: If the value of A in Table No. 4.2.1 is less than the sum of the sanctioned intake (N) and the lateral entry including leftover seats (N2), then the value of A in Table No. 4.2.1 should be the sum of the sanctioned intake (N) and the lateral entry including leftover seats (N2).

4.3 Academic Performance of the First-Year Students of the Program (10)

Total Marks 5.24

Table No.4.3.1: Academic Performance of the First-Year Students of the Program.

Academic Performance	CAYm1(2024-25)	CAYm2(2023-24)	CAYm3 (2022-23)
Mean of CGPA or mean percentage of all successful students(X)	7.17	7.03	6.38
Y=Total no. of successful students	49.00	40.00	47.00
Z=Total no. of students appeared in the examination	59.00	56.00	63.00
API [X*(Y/Z)]	5.95	5.02	4.76

Average API[(AP1+AP2+AP3)/3] : 5.24

Assessment = Average API : 5.24

4.4 Academic Performance of the Second Year Students of the Program (10)

Total Marks 6.26

Institute Marks : 6.26

Table No.4.4.1: Academic Performance of the Second Year Students of the Program.

Academic Performance	CAYm1 (2024-25)	CAYm2 (2023-24)	CAYm3 (2022-23)
X=(Mean of 2nd year grade point average of all successful students on a 10-point scale) or (Mean of the percentage of marks of all successful students in 2rd year/10)	7.19	6.53	6.28
Y=Total no. of successful students	44.00	52.00	45.00
Z=Total no. of students appeared in the examination	47.00	59.00	45.00
API [X * (Y/Z)]	6.73	5.76	6.28

Average API [(AP1 + AP2 + AP3)/3] : 6.26

Assessment [AverageAPI] : 6.26

4.5 Academic Performance of the Third Year Students of the Program (10)

Total Marks 5.90

Institute Marks : 5.90

Table No.4.5.1: Academic Performance of the Third Year Students of the Program

Academic Performance	CAYm1 (2024-25)	CAYm2 (2023-24)	CAYm3 (2022-23)
X=(Mean of 3rd year grade point average of all successful students on a 10-point scale) or (Mean of the percentage of marks of all successful students in 3rd year/10)	6.59	6.28	6.51
Y=Total no. of successful students	49.00	44.00	92.00
Z=Total no. of students appeared in the examination	52.00	45.00	112.00
API [X*(Y/Z)]:	6.21	6.14	5.35

Average API [(AP1 + AP2 + AP3)/3] : 5.90

Assessment [1.5 * AverageAPI] : 5.90

4.6 Placement, Higher Studies and Entrepreneurship (30)

Total Marks 11.28

Table No. 4.6.1: Placement, higher studies, and entrepreneurship details.

Item	LYG (2021-22)	LYGm1(2020-21)	LYGm2(2019-20)
FS*=Total no. of final year students	79.00	197.00	223.00
X=No. of students placed	37.00	60.00	70.00
Y=No. of students admitted to higher studies	1.00	3.00	2.00
Z= No. of students taking up entrepreneurship	0.00	0.00	1.00
Placement Index(P) = $\frac{(X + Y + Z)}{FS} * 100$:	48.10	31.98	32.74

Average Placement Index = $(P_1 + P_2 + P_3)/3$: 37.61

Placement Index Points: 11.28

4.7 Professional Activities (25)

Total Marks 25.00

Table No. 4.7.1.1: List of active professional societies/bodies/chapters/clubs.

S.No	Name of the Professional Societies/Bodies, Chapters, Clubs
1	MESA
2	RCPIT Motorsport Club
3	Aakruti-X Club
4	SAE-Chapter
5	ISTE-Chapter

Table No. 4.7.1.2: List of events/programs organized.**(CAYm1) 2024-25**

S.No	Name of the Professional Societies/Bodies, Chapters, Clubs	Name of the Event	National/International level	Date of Event (DD/MM/YYYY)
1	RCPIT Motorsport Club	Water Rocket Challenge	National	27/02/2025
2	RCPIT Motorsport Club	Aero Gliding Competition	National	27/02/2025
3	MESA	Googler	National	27/02/2025
4	Aakruti-X Club	Engineering Documentation and Technical Photography	State	04/10/2024
5	Aakruti-X Club	CAD Visualization and Technical Presentation Skills Workshop	State	17/09/2024
6	MESA	Ganpati Visarjan Conveyor : System Improvement	State	09/09/2024

(CAYm2) 2023-24

S.No	Name of the Professional Societies/Bodies, Chapters, Clubs	Name of the Event	National/International level	Date of Event (DD/MM/YYYY)
1	RCPIT Motorsport Club	Workshop on Transmission and Powertrain Fundamentals	State	15/04/2024
2	Aakruti-X Club	Aero Gliding Competition	National	16/02/2024
3	RCPIT Motorsport Club	Water Rocket Challenge	National	16/02/2024
4	MESA	Mechanical Quiz	State	22/12/2023
5	MESA	Ganpati Visarjan Conveyor: Planning & Fabrication	State	20/09/2023
6	Aakruti-X Club	Concept Design of Visarjan Conveyor System (Community Engineering Event)	State	30/08/2023

(CAYm3) 2022-23

S.No	Name of the Professional Societies/Bodies, Chapters, Clubs	Name of the Event	National/International level	Date of Event (DD/MM/YYYY)
1	RCPIT Motorsport Club	Engineering Workshop Safety and Tools Orientation	State	11/04/2023
2	RCPIT Motorsport Club	Brake and Transmission Systems – Basics Workshop	National	20/03/2023
3	Aakruti-X Club	Mad for CAD	National	25/02/2023
4	MESA	Introduction to Automotive Vehicle Systems	State	09/12/2022
5	MESA	Social Awareness through Engineering Design Campaign	State	04/10/2022
6	Aakruti-X Club	CAD Tools Orientation and Hands-on Training Session	State	29/09/2022

4.7.2 Student's Participations in Professional Events (10)

Institute Marks : 10.00

**Table No. 4.7.2.1: List of students participated in professional events.
(CAYm1) 2024-25**

S.No	Name of the Student	Name of the Event	State /State /National/International level	Date of Event (DD/MM/YYYY)	Name of Award
1	Patil Sachin Vinod	Youth Ideathon 2025, IIT Delhi	National	05/04/2025	Awarded Top 100
2	Pawar Rohit Harekrishna	Youth Ideathon 2025, IIT Delhi	National	05/04/2025	Awarded Top 100
3	Girase Tejas Pradipsing	Youth Ideathon 2025, IIT Delhi	National	05/04/2025	Awarded Top 100
4	Girase Sumit Mahendrasing	Tech SanjavaniK25 - Robo Race, Sanjivani College of Engineering, Kopargaon	National	08/02/2025	1st Prize
5	Girase Sumit Mahendrasing	Jamrang - Line Follower Race, Vijaybhoomi University, Karjat	National	21/02/2025	2nd Prize
6	Patil Vaishnavi Sunil	Technical Events Chakva, Anvesh2024,PCCOE, Pune	State	08/05/2025	NIL
7	Fartade Rakshita Amar	TATA Crucible Campus Quiz 2024	National	10/10/2024	NIL
8	Girase Tejas Pradipsing	Igniting Innovation, Startup India, Nashik, Govt. of Maharashtra	State	28/02/2025	1st Prize
9	Patil Chetan Ravindra	Smart India Hackathon, Coimbatore, Tamilnadu	National	11/12/2025	NIL
10	Jadhav Ujwalsing Narendrasing	Smart India Hackathon, Coimbatore, Tamilnadu	National	11/12/2025	NIL
11	Nikum Pritesh Jitendra	Smart India Hackathon, Coimbatore, Tamilnadu	National	11/12/2025	NIL
12	Chaudhari Dhananjay Jadhav	Smart India Hackathon, Coimbatore, Tamilnadu	National	11/12/2025	NIL
13	Sonawane Tejswini Ramesh	Smart India Hackathon, Coimbatore, Tamilnadu	National	11/12/2025	NIL
14	Borase Meghana Prabhakar	Smart India Hackathon, Coimbatore, Tamilnadu	National	11/12/2025	NIL
15	Jadhav Ujwalsing Narendrasing	The AICTE Innovation, Design & Entrepreneurship (IDE) Bootcamp Phase-II, RK University, Rajkot	National	17/02/2025	NIL
16	Nikum Pritesh Jitendra	The AICTE Innovation, Design & Entrepreneurship (IDE) Bootcamp Phase-II, RK University, Rajkot	National	17/02/2025	NIL
17	Chaudhari Dhananjay Jadhav	The AICTE Innovation, Design & Entrepreneurship (IDE) Bootcamp Phase-II, RK University, Rajkot	National	17/02/2025	NIL
18	Patil Yashashri Kamalesh	The AICTE Innovation, Design & Entrepreneurship (IDE) Bootcamp Phase-II, RK University, Rajkot	National	17/02/2025	NIL
19	Sonawane Tejswini Ramesh	The AICTE Innovation, Design & Entrepreneurship (IDE) Bootcamp Phase-II, RK University, Rajkot	National	17/02/2025	NIL
20	Mahajan Nikitesh Dharmendra	The AICTE-organized Innovation, Design, and Entrepreneurship (IDE) Bootcamp (Edition 2, Phase II), Gyan Ganga Institute of Technology & Sciences (GGIT	National	17/02/2025	NIL
21	Tatar Pranav Nitin	The AICTE-organized Innovation, Design, and Entrepreneurship (IDE) Bootcamp (Edition 2, Phase II), Gyan Ganga Institute of Technology & Sciences (GGIT	National	17/02/2025	NIL

22	Mahule Chetan Pradeep	The AICTE-organized Innovation, Design, and Entrepreneurship (IDE) Bootcamp (Edition 2, Phase II), Gyan Ganga Institute of Technology & Sciences (GGIT)	National	17/02/2025	NIL
23	Nikam Rahul Sanjay	The AICTE-organized Innovation, Design, and Entrepreneurship (IDE) Bootcamp (Edition 2, Phase II), Gyan Ganga Institute of Technology & Sciences (GGIT)	National	17/02/2025	NIL
24	Girase Digvijaysing Khumansing	The AICTE-organized Innovation, Design, and Entrepreneurship (IDE) Bootcamp (Edition 2, Phase II), Gyan Ganga Institute of Technology & Sciences (GGIT)	National	17/02/2025	NIL
25	Makhija Kirtan Dilip	The AICTE-organized Innovation, Design, and Entrepreneurship (IDE) Bootcamp (Edition 2, Phase II), Gyan Ganga Institute of Technology & Sciences (GGIT)	National	17/02/2025	NIL
26	Chaudhari Devyani Sunil	The AICTE-organized Innovation, Design, and Entrepreneurship (IDE) Bootcamp (Edition 2, Phase II), Geetanjali Institute of Technical Studies, Udaipur	National	17/02/2025	NIL
27	Patil Ankit Santosh	The AICTE-organized Innovation, Design, and Entrepreneurship (IDE) Bootcamp (Edition 2, Phase II), Geetanjali Institute of Technical Studies, Udaipur	National	17/02/2025	NIL
28	Kumbhar Sanket Gopal	The AICTE-organized Innovation, Design, and Entrepreneurship (IDE) Bootcamp (Edition 2, Phase II), Geetanjali Institute of Technical Studies, Udaipur	National	17/02/2025	NIL
29	Girase Sumit Mahendrasing	Robo Race, Jawahar Education Society's, IoT, Nashik	National	22/02/2025	1st Prize

(CAYm2) 2023-24

S.No	Name of the Student	Name of the Event	State /National/International level	Date of Event (DD/MM/YYYY)	Name of Award
1	Dhole Dimple Ishwar	AAKRUTI Global-Design Contest Shaping Imagination 2024, By Dassult Systems	International	18/05/2024	NIL
2	Patil Jayashri Mahendra	AAKRUTI Global-Design Contest Shaping Imagination 2024, By Dassult Systems	International	18/05/2024	NIL
3	Patil Gopal Lotan	AAKRUTI Global-Design Contest Shaping Imagination 2024, By Dassult Systems	International	18/05/2024	NIL
4	Ghaisas Prathamesh Vijay	Excalibur-2K24-Robo War, Amrutvahini CoE, Sangamner	National	18/04/2024	2nd rank
5	Badgujar Sai Kalyan	IEEE YESISTI2, Budge Budge Institute of Technology	National	05/04/2024	2nd rank
6	Girase Jaypal Deelipsing	Brain Teaser at Mungi	State	16/03/2024	1st prize
7	Girase Sumit Mahendrasing	SHK Technofest2024-RoboRace, Sapkal Knowledge Hub	National	13/04/2024	NIL

(CAYm3) 2022-23

S.No	Name of the Student	Name of the Event	State /National/International level	Date of Event (DD/MM/YYYY)	Name of Award
1	Bhadane Shekhar Ramesh	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
2	Ghaisas Prathamesh Vijay	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
3	Chetan Pankaj Nikam	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
4	Marathe Rohit Rajendra	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
5	Chavan Hrushikesh Ajit	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
6	Padvi Shubham Soham	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
7	Patil Shubham Arjun	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
8	Tamkhane Himanshu Motilal	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
9	Dhole Sandip Gulabrao	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
10	Anurag Rajesh Pimpariya	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
11	Khatik Kaship Abbas	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
12	Girase Virendrasinh Mahendrasinh	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
13	Borse Harshal Govindrao	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	State	02/01/2023	NIL
14	Shivade Swapnil Govindrao	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
15	Sapkale Vaishnavi Jitendra	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
16	Hitesh Jitendra Chaudhari	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
17	Manish Laxman Savant	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
18	Chetan Yashwant Nikwade	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
19	Bhavesh Ravindra Mahajan	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
20	Gujar Kalpesh Prakash	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
21	Karankal Mrunal Milind	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
22	Jadhav Sachin Hira	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
23	Tilok Mahendra Bhandari	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
24	Rushikesh Sunil Patil	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
25	Patil Vinit Narvirsing	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
26	Mahure Dhiraj Bhagwan	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
27	Bhadhane Parth Madhuchitra	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL

28	Pimpriya Anurag Rajesh	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
29	Brajesh Sunil Nikumbh	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
30	Patil Suyog Sanjay	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
31	Bari Sanjana Bharat	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
32	Nikam Sakshi Sunilrao	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
33	Raulji Devdevyani Mangalsigh	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
34	Tejas Pradipsing Girase	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
35	Patil Gopal Ravindra	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL
36	Savale Vishal Sanjay	Auto India Racing Championship (AIRC) Season 5, Pune	National	19/05/2022	NIL

4.7.3 Publication of Journals, Magazines, Newsletters, etc. in the Department (5)

Institute Marks : 5.00

Table No. 4.7.3.1: List of students involved in publication of journals, magazines, and newsletters, etc. in the Department.

(CAYm1) 2024-25

S.No	Name of the Journal, Magazine, Newsletter	Name of the Editor	Name of the Student	Semester	No. of Issues	Hard copy/Soft copy
1	MechNova : 2024-25/02 (Department Newsletter)	Mr. Manoj R Patil (Editor), Rajput Vishakha Dilip (Co-editor)	Makhija Kirtan Dilip, Mahajan Nikitesh Dharmendra	6	1	Soft Copy
2	MechNova : 2024-25/01 (Department Newsletter)	Mr. Manoj R Patil (Editor), Rajput Vishakha Dilip (Co-editor)	Patil Rohan Mahesh, Kulkarni Shweta Ravindra	7	1	Soft Copy
3	Yantramanch: 2024-25 (Department Magazine)	Mr. Manoj R Patil (Editor), Patil Jayshri Mahendra (Co-editor)	Patil Yash Rajendra Bhandari Tilok Mahendra Mahule Chetan Pradeep Fartade Rakshita Amar	8	1	Soft Copy

(CAYm2) 2023-24

S.No	Name of the Journal, Magazine, Newsletter	Name of the Editor	Name of the Student	Semester	No. of Issues	Hard copy/Soft copy
1	MechNova : 2023-24/02 (Department Newsletter)	Mr. Manoj R Patil (Editor) Rajput Vishakha Dilip (Co-editor)	Deore Vaishnavi Sunil Patil Rohan Mahesh Makhija Kirtan Dilip Mahajan Nikitesh Dharmendra	4	1	Soft Copy
2	MechNova : 2023-24/01 (Department Newsletter)	Mr. Manoj R Patil (Editor) Rajput Vishakha Dilip (Co-editor)	Deore Vaishnavi Sunil Patil Rohan Mahesh Makhija Kirtan Dilip Mahajan Nikitesh Dharmendra	7	1	Soft Copy
3	Yantramanch: 2023-24 (Department Magazine)	Mr. Manoj R Patil (Editor) Patil Jayshri Mahendra (Co-editor)	Surve Tejal Prashantrao Patil Yash Rajendra Bhandari Tilok Mahendra Mahule Chetan Pradeep	8	1	Soft Copy

(CAYm3) 2022-23

S.No	Name of the Journal, Magazine, Newsletter	Name of the Editor	Name of the Student	Semester	No. of Issues	Hard copy/Soft copy
1	MechNova : 2022-23/02 (Department Newsletter)	Mr. Sunil V Yeole (Editor) Yogeshkumar R Pathak (Co-editor)	Bhamare Pratik Anil Shimpi Pratik Kailas Patil Gaurav Kailas Rajput Bhagyashri Virpal	8	1	Soft Copy
2	MechNova : 2022-23/01 (Department Newsletter)	Mr. Sunil V Yeole (Editor) Yogeshkumar R Pathak (Co-editor)	Bhamare Pratik Anil Shimpi Pratik Kailas Patil Gaurav Kailas Rajput Bhagyashri Virpal	7	1	Soft Copy
3	Yantramanch : 2022-23 (Department Magazine)	Mr. Sunil V Yeole (Editor) Yogeshkumar R Pathak (Co-editor)	Mandge Pratik Rakesh Patil Gaurav Jayvant Jakhete Sumeet Narendra Gurav Bhushan Deepak	8	1	Soft Copy

**Table No. 4.7.4.1: List of student publications.
(CAYm1) 2024-25**

S.No	Name of the Student	Semester	Name of the Publisher	Name of the Journal/ Conference, etc.	Volume No.	Issue No.	Name of the Award if any
1	Patil Yash Rajendra Patole Manish Hitendra Mali Dipak Dnyaneshwar	8	Copyright office, Govt. of India	Copyright Certificate	0	0	-
2	Patil Chetan Ravindra Jadhav Ujwalsing Narendrasing Nikum Pritesh Jitendra Chaudhari Dhananjay	6	GF's Godavari College of Engineering, Jalgaon.	International Conference on Recent Advances in Engineering, Science and Technology (ICRAEST- 2025) Proceedings	0	0	1st Rank
3	Patil Chetan Ravindra Jadhav Ujwalsing Narendrasing Nikum Pritesh Jitendra Chaudhari Dhananjay Ja	6	International Journal of Innovations in Engineering and Science	International Journal of Innovations in Engineering and Science	10	9	-
4	Badgujar Manish Gopal Khairnar Sahil Yuvraj Chaudhari Abhishek Bhatu Badgujar Ketan Ravindra	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
5	Chaudhari Chetan Anil Pardeshi Virendra Pravinsing Shinde Hitesh Santosh Patil Rajesh Mohan	8	GF's Godavari College of Engineering, Jalgaon	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
6	Patil Gopal Lotan Patil Kunal Pravin Koli Ritesh Rohidas Patil Swanand Dilip	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
7	Patil Hemant Dhanraj Jadhav Shubham Suresh Borse Lalit Rajendra Wagh Yadnyesh Murlidhar	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
8	Tamkhane Himanshu Motilal Ahire Vikrant Pramod Chaudhari Darshan Subhash More Mayur Hemraj	8	GF's Godavari College of Engineering, Jalgaon	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
9	Chaudhari Varun Gunwant Savant Manish Laxman Chaudhari Hitesh Jitendra Bagal Aaditya Jagdish	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
10	Patil Yash Rajendra Patole Manish Hitendra Patil Rohan Mahesh Saindane Jagdish Rajendra	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
11	Mali Dipak Dnyaneshwar Patil Divyesh Ravindra Koli Abhishek Ravindra	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
12	Pardeshi Virendra Pravinsing Shinde Hitesh Santosh Bidkar Gaurav Lotan	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
13	Badgujar Manish Gopal Khairnar Sahil Yuvraj Chaudhari Abhishek Bhatu Badgujar Ketan Ravindra	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-
14	Chaudhari Chetan Anil Pardeshi Virendra Pravinsing Shinde Hitesh Santosh Patil Rajesh Mohan	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering, Science and Technology"- (ICRAEST-2025) Proceedings	0	0	-

S.No	Name of the Student	Semester	Name of the Publisher	Name of the Journal/ Conference, etc.	Volume No.	Issue No.	Name of the Award if any
1	Thakare Dipak Dhondu Shinde Hitesh Indrasing Jaware Harshwardhan Vilas	8	Godavari CoE, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
2	Rajput Gayatri Suresh Daf Kiran Gangadhar Patil Pratik Bhaskar Patil Rushi Gulab	8	Godavari CoE, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
3	Khair Ganesh Kailas Jadhav Rohit Prabhakar Badgujar Rushikesh Arvind	8	Godavari CoE, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
4	Pimpriya Anurag Rajesh Patil Kirti Pravin Patil Yash Suryabhan Suryavanshi Om Nimba	8	Godavari CoE, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
5	Patil Kalpesh Pankaj Shukla Shubham Subhash Patil Prathmesh Chandrakant Dhole Sandip Gulabrao	8	Godavari CoE, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
6	Pawara Bharat Janzadya Nikam Ganesh Rahul Nhavi Apeksha Anil	8	Godavari CoE, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
7	Patil Vinit Narvirsing Gujar Kalpesh Prakash Karankal Mrunal Milind Jadhav Darshan Dilip	8	Godavari CoE, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
8	Mohammad Mujtahid Mohammad Hanif Patil Chetan Anil Prathamesh Vishal Mahajan	8	Godavari CoE, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
9	Marathe Rohit Rajendra Padvi Shubham Soham Chavan Hrushikesh Ajit	8	Godavari CoE, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
10	Bhadane Jayesh Ravindra Sutar Vishal Dnyaneshwar Dhongade Trunal Purushottamji Thorat Siddharth K	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
11	Chavan Sagar Vasant Sapkale Vishal Parshuram Nikam Sakshi Sunilrao	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
12	Darshan Bagul Surve Tejal Prashantrao Suryavanshi Jayesh Sunil	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-
13	Savale Vishal Sanjay Mahure Dhiraj Bhagwan Jadhav Sachin Hira	8	GF's Godavari College of Engineering, Jalgaon	International Conference on "Recent Advances in Engineering Science and Technology"-(ICRAEST-2024) Proceedings	0	0	-

S.No	Name of the Student	Semester	Name of the Publisher	Name of the Journal/ Conference, etc.	Volume No.	Issue No.	Name of the Award if any
1	Khairnar Mukul Anil	8	The Patent office, Govt. of India	Certificate of Registration of Design	0	0	-
2	Khairnar Mukul Anil	8	The Patent office, Govt. of India	Certificate of Registration of Design	0	0	-
3	Wadile Mohit Suresh Patil Gaurav Kailas Mahajan Vishal Umesh Chaudhari Ravindra Pramod	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2023) Proceedings	0	0	-
4	Gadilohar Bhavesh Sandip Patil Aniket Anil Pathan Taherim Khan Nasir Khan	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2023) Proceedings	0	0	-
5	Wagh Kiran Ramesh Nikam Kunal Vasanttrao Dusane Ganesh Vishwanath More Devendra Liladhar	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2023) Proceedings	0	0	-
6	Bhamare Pratik Anil Patil Nikhil Rajendra Shimpi Pratik Kailas Mahajan Megha Bhaskar	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2023) Proceedings	0	0	-
7	Patil Hitesh Dinkar Patil Mayur Vijay Chavan Mayur Chandrakant Gite Shrikrushna Vikas	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2023) Proceedings	0	0	-
8	Ghorpade Aditya Charansing Sonawane Himanshu Dayaram Patil Prasad Kishor	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2023) Proceedings	0	0	-
9	Khairnar Kamlesh Gorakh Patil Aditya Prashant Desale Bhavesh Vilas Beldar Khushalchand Sandip	8	GF's Godavari College of Engineering, Jalgaon.	International Conference on "Recent Advances in Engineering Science and Technology"- (ICRAEST-2023) Proceedings	0	0	-

5 FACULTY INFORMATION (100)

Total Marks 94.89

Sr.No	Name of the Faculty	PAN No.	APAAR faculty ID*(if any)	Highest degree	University	Area of Specialization	Date of Joining in this Institution	Experience in years in current institute	Designation at Time Joining in this Institution	Present Designation	The date on which Designated as Professor/ Associate Professor if any	Nature of Association (Regular/ Contract/ Ad hoc)	Currently Associated (Y/N)	In case of NO, Date of Leaving	IS HOD?
1	Dr. Pravin Laxmanrao Sarode	BLPPS0512Q	NA	Ph.D	Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	Mechanical-Design Engineering	12/07/2010	15.6	Assistant Professor	Professor	01/07/2025	Regular	Yes		Yes
2	Mr. Manoj Rajan Patil	APBPP3815L	NA	M.Tech	Dr. Babasaheb Ambedkar Technological University,Lonere	Thermal & Fluids Engineering	15/07/2006	19.6	Lecturer	Assistant Professor		Regular	Yes		No
3	Dr. Hemant Krishnarao Wagh	AAUPW9802E	NA	Ph.D	Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	Computer Integrated Manufacturing	17/07/2006	19.6	Lecturer	Professor	01/07/2020	Regular	Yes		No
4	Dr. Kapil Ashokrao Saner	BOXPS8168D	NA	Ph.D	Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	Mechanical-Machine Design	02/01/2008	18	Lecturer	Associate Professor	01/07/2025	Regular	Yes		No
5	Mr. Sunil Vasudeo Yeole	AEBPY9559D	NA	M.E.	Sant Gadge Baba Amravati University	Mechanical-CAD-CAM	14/01/2008	18	Lecturer	Assistant Professor		Regular	Yes		No
6	Dr. Pandit Subhash Patil	BIVPP0791H	NA	Ph.D	Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	Mechanical-Machine Design	14/07/2010	15.6	Assistant Professor	Associate Professor	01/07/2019	Regular	Yes		No
7	Mr. Anil Hiralal Kumbhar	BSHPK6487M	NA	M.Tech	Rajiv Gandhi Proudyogiki Vishwavidyalaya,Bhopal	Heat Power & Thermal Engineering	10/07/2010	15.6	Assistant Professor	Assistant Professor		Regular	Yes		No
8	Dr. Bhushan Youraj Patil	AYYPP2024P	NA	Ph.D	Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	Thermal System Design	22/07/2011	14.5	Assistant Professor	Associate Professor	01/07/2025	Regular	Yes		No
9	Dr. Pradip Darbarsing Jamadar	ALZPJ7551M	NA	Ph.D	Amity University,Jaipur,Rajasthan	General Mechanical Engineering	01/08/2011	14.5	Assistant Professor	Assistant Professor		Regular	Yes		No
10	Mr. Nilesh Mohan Shinde	BYOPS3919P	NA	M.E.	Savitribai Phule Pune University, Pune	Heat Power	12/08/2013	12.5	Assistant Professor	Assistant Professor		Regular	Yes		No
11	Mr. Rohan Rajendra Ozarkar	AAWPO6654N	NA	M.Tech	Shri Guru Gobind Singhji Institute of Engineering and Technology,Nanded	Mechanical-CAD-CAM	19/08/2014	11.4	Assistant Professor	Assistant Professor		Regular	Yes		No
12	Mr. Sachin Nana Pawar	DXYPP6227A	NA	M.Tech	GITAM University, Visakhapatnam	CAD-CAM	01/07/2024	1.6	Assistant Professor	Assistant Professor		Regular	Yes		No

13	Mr. Janardan Bhikulal Bhavsar	DCPPB3984N	NA	M.Tech	Dr. Babasaheb Ambedkar Technological University, Lonere	Mechanical Engineering	28/08/2025	0.4	Assistant Professor	Assistant Professor		Regular	Yes		No
14	Dr. Kiran Dinkar Chaudhari	AHQPC7918Q	NA	Ph.D	Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	Mechanical-CAD-CAM	02/01/2008	17.5	Lecturer	Assistant Professor		Regular	No	16/06/2025	No
15	Mr. Juber Ahamad Mo.Salim Khatik	BCXPK8571N	NA	M.E.	Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	Mechanical Engineering	07/02/2011	14.4	Assistant Professor	Assistant Professor		Regular	No	16/06/2025	No
16	Dr. Pankaj Valmik Baviskar	AMTPB0878Q	NA	Ph.D	Medicaps University, Indore,MP	Mechanical Engineering	01/08/2011	13.10	Assistant Professor	Assistant Professor		Regular	No	16/06/2025	No
17	Dr. Pradip Kailas Patil	BFKPP9788L	NA	Ph.D	Amity University,Jaipur,Rajasthan	Mechanical Engineering	02/01/2012	13.5	Assistant Professor	Assistant Professor		Regular	No	16/06/2025	No
18	Mr. Yogeshkumar Raghunath Pathak	AXIPP5727E	NA	M.Tech	Sardar Vallabhbai National Institute of Technology, Surat	Turbo Machines	01/08/2012	12.10	Assistant Professor	Assistant Professor		Regular	No	16/06/2025	No
19	Mr. Kailas Dhanraj Deore	AOZPD6782R	NA	M.Tech	Sardar Vallabhbai National Institute of Technology, Surat	Industrial process,Equipment's Design	08/08/2013	11.10	Assistant Professor	Assistant Professor		Regular	No	16/06/2025	No
20	Mr. Nilesh Arun Patil	BNNPP4223R	NA	M.E.	Gujarat Technological University, Ahmedabad	Thermal Engineering	12/08/2013	11.10	Assistant Professor	Assistant Professor		Regular	No	16/06/2025	No
21	Dr. Nitin Girdhar Shinde	BLPPS0003J	NA	Ph.D	Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	Mechanical Engineering	15/07/2014	10.11	Assistant Professor	Assistant Professor		Regular	No	16/06/2025	No
22	Dr. Rahul Dilip Sandhanshiv	BXKPS6636J	NA	Ph.D	Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon	Mechanical Engineering-CAD-CAM	06/01/2012	12.4	Assistant Professor	Assistant Professor		Regular	No	29/05/2024	No

5.1 Student-Faculty Ratio (SFR) (30)

Total Marks 26.00

No. of UG(Engineering) programs in Department including allied departments/ clusters (UGn):

UG1=1st UG program

UGn=nth UG program

B= No. of Students in UG 2nd year (ST)

C= No. of Students in UG 3rd year (ST)

D= No. of Students in UG 4th year (ST)

No. of PG (Engineering) programs in Department including allied departments/ clusters (PGm):

PG1=1st PG program.

PGm=mth PG program

A= No. of Students in PG 1st year

B= No. of Students in PG 2nd year

Student Faculty Ratio (**SFR**) = S/F

S= No. of students of all programs in the Department including all students of allied departments/clusters.

No. of students (ST)=Sanctioned Intake (SA)+ Actual admitted students via lateral entry including leftover seats (L) if any (limited to 10 % of SA)

Students who admitted under supernumerary quotas (SNQ, EWS, etc) will not be considered in calculating SFR value. Those students are exempted.

F=Total no. of regular or contractual faculty members (Full Time) in the Department, including allied departments/clusters (excluding first year faculty (The faculty members who have a 100% teaching load in the first-year courses)).

UG

No. of UG(Engineering) programs in Department including allied departments/clusters(UGn):

Mechanical Engineering						
Year of Study	CAY		CAYm1		CAYm2	
	(2025-26)		(2024-25)		(2023-24)	
	Sanction Intake	Actual admitted through lateral entry students	Sanction Intake	Actual admitted through lateral entry students	Sanction Intake	Actual admitted through lateral entry students
2nd Year	60	6	60	6	60	6
3rd Year	60	6	60	6	60	6
4th Year	60	6	60	6	120	12
Sub-Total	180	18	180	18	240	24
Total	198		198		264	
Grand Total	<input type="text" value="198"/>		<input type="text" value="198"/>		<input type="text" value="264"/>	

PG

No. of PG Programs in the Department

Grand Total	<input type="text"/>	<input type="text"/>	<input type="text"/>
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SFR

No. of UG Programs in the Department

No. of PG Programs in the Department

Mechanical Engineering

Description	CAY(2025-26)	CAYm1 (2024-25)	CAYm2 (2023-24)
UG1.B	66	66	66
UG1.C	66	66	66
UG1.D	66	66	132
UG1: Mechanical Engineering	198	198	264
DS=Total no. of students in all UG and PG programs in the Department	198	198	264
AS=Total no. of students of all UG and PG programs in allied departments	0	0	0
S=Total no. of students in the Department (DS) and allied departments (AS)	S1= 198	S2= 198	S3= 264
DF=Total no. of faculty members in the Department	13	20	20
AF= Total no. of faculty members in the allied Departments	0	0	0
F=Total no. of faculty members in the Department (DF) and allied Departments (AF)	F1= 13	F2= 20	F3= 20
FF=The faculty members in F who have a 100% teaching load in the first-year courses	4	4	3
Student Faculty Ratio (SFR)=S/(F-FF)	SFR1= 22.00	SFR2= 12.38	SFR3= 15.53
Average SFR for 3 years	SFR= 16.64		

Average SFR for three assessment years : 16.64

Assessment SFR : 26

5.2 Faculty Qualification (25)

Total Marks 23.89
Institute Marks : 23.89

Year	X	Y	RF	$FQ = 2.5 \times [(10X + 4Y) / RF]$
2025-26(CAY)	5	8	9.00	22.78
2024-25(CAYm1)	4	16	9.00	28.89
2023-24(CAYm2)	4	16	13.00	20.00

Average Assessment : 23.89

5.3 Faculty Cadre Proportion (25)

Total Marks 25.00

Year	Professors		Associate Professors		Assistant Professors	
	Required F1	Available	Required F2	Available	Required F3	Available
CAY(2025-26)	1.00	2.00	2.00	3.00	6.00	8.00
CAYm1(2024-25)	1.00	1.00	2.00	1.00	6.00	18.00
CAYm2(2023-24)	1.00	1.00	2.00	1.00	8.00	18.00
Average Numbers	1.00	1.33	2.00	1.67	6.67	14.67

Cadre Ratio Marks [(AF1 / RF1) + [(AF2 / RF2) * 0.6] + [(AF3 / RF3) * 0.4]] * 12.5 : 25.00

5.4 Visiting/Adjunct/Emeritus Faculty etc. (10)

Total Marks 10.00

Institute Marks : 10.00

Table No. 5.4.1: List of visiting/adjunct faculty/professor of practice and their teaching and practical loads.

(CAYm1) 2024-25

S.No	Name of the Person	Designation	Organization	Name of the Course	No. of hours handled
1	Mr. Dhanjay Ananda Mahajan	Tech Led	L&T Technology Services, Pune	CAE	52.00

(CAYm2) 2023-24

S.No	Name of the Person	Designation	Organization	Name of the Course	No. of hours handled
1	Mr. Hemant Rajendra Patil	R&D QA Engineer	Dassault Systems, Pune	CATIA/Computer-Aided Design CAD Processes	53.00

(CAYm3) 2022-23

S.No	Name of the Person	Designation	Organization	Name of the Course	No. of hours handled
1	Mr. Dhanjay Ananda Mahajan	Assistant Manager	Anand Automotive Pvt.ltd	CAE	52.00

5.5 Faculty Retention (10)

Total Marks 10.00

Description	2024-25 (CAYm1)	2023-24 (CAYm2)	2022-23 (CAYm3)
RF=No. of required faculty in the Department including allied Departments to adhere to the 20:1 Student-Faculty ratio, with calculations based on both student numbers and faculty requirements as per section 5.1 of SAR; (RF=S/20).	9	13	17
AF=The no. of available faculty members in the Department including allied Departments	20	20	20
A= The no. of faculty members at the current institute with less than 1 year of experience (A in AF)	0	0	0
B= The no. of faculty members at the current institute with more than 1 year and less than 2 years of experience (B in AF)	1	0	0
C= The no. of faculty members at the current institute with more than 2 years and less than 3 years of experience (C in AF)	0	0	0
D= The no. of faculty members at the current institute with more than 3 years and less than 4 years of experience (D in AF)	0	0	0
E= The no. of faculty members at the current institute with more than 4 years of experience (E in AF)	19	20	20
FR= $((A*0) + (B*1) + (C*2) + (D*3) + (E*4)) / RF$ *2.50 (points limited to 10)	10	10	10

Average : 10.00

Assessment Marks : 10.00

6 FACULTY CONTRIBUTIONS (120)

Total Marks 89.00

6.1 Professional Development Activities (60)

Total Marks 60.00

Table No. 6.1.1.1: List of faculty members and their memberships.

S.No	Name of the Faculty	Name of the Professional Society /Body at National and International Level	Name of the Grade/ Level/Position
1	Dr. Pravin Laxmanrao Sarode	Indian Society for Technical Education	Member
2	Dr. Pravin Laxmanrao Sarode	IAENG (International Association of Engineers)	Member
3	Dr. Pravin Laxmanrao Sarode	SAE INDIA	Member
4	Mr. Manoj Rajan Patil	Indian Society for Technical Education	Member
5	Dr. Hemant Krishnarao Wagh	Indian Society for Technical Education	Member
6	Dr. Hemant Krishnarao Wagh	IAENG (International Association of Engineers)	Member
7	Dr. Hemant Krishnarao Wagh	International Scientific Academy Of Engineering & Technology (ISAET)	Member
8	Dr. Hemant Krishnarao Wagh	International Society of Development and Sustainability (ISDS)	Member
9	Dr. Hemant Krishnarao Wagh	i-Explore International Research Journal Consortium (IIRJC)	Member
10	Dr. Kapil Ashok Saner	Indian Society for Technical Education	Member
11	Dr. Kapil Ashok Saner	IAENG (International Association of Engineers)	Member
12	Mr. Sunil Vasudeo Yeole	Indian Society for Technical Education	Member
13	Mr. Sunil Vasudeo Yeole	IAENG (International Association of Engineers)	Member
14	Dr. Pandit Subhash Patil	IAENG (International Association of Engineers)	Member
15	Mr. Anil Hiralal Kumbhar	IAENG (International Association of Engineers)	Member
16	Dr. Bhushan Youraj Patil	IAENG (International Association of Engineers)	Member
17	Dr. Bhushan Youraj Patil	SAE INDIA	Member
18	Dr. Pradip Darbarsing Jamadar	IAENG (International Association of Engineers)	Member
19	Mr. Nilesh Mohan Shinde	IAENG (International Association of Engineers)	Member
20	Mr. Rohan Rajendra Ozarkar	IAENG (International Association of Engineers)	Member
21	Mr. Sachin Nana Pawar	CSTA	Member
22	Mr. Kiran Dinkar Chaudhari	Indian Society for Technical Education	Member
23	Mr. Kiran Dinkar Chaudhari	IAENG (International Association of Engineers)	Member
24	Mr. Juber Ahamad Mo. Salim Khatik	IAENG (International Association of Engineers)	Member
25	Mr. Pankaj Valmik Baviskar	IAENG (International Association of Engineers)	Member
26	Mr. Pradip Kailas Patil	IAENG (International Association of Engineers)	Member
27	Mr. Kailas Dhanraj Deore	IAENG (International Association of Engineers)	Member
28	Mr. Nilesh Arun Patil	IAENG (International Association of Engineers)	Member
29	Dr. Nitin Girdhar Shinde	Indian Society for Technical Education	Member
30	Dr. Nitin Girdhar Shinde	IAENG (International Association of Engineers)	Member
31	Dr. Rahul Dilip Sandhanshiv	Indian Society for Technical Education	Member
32	Mr. Kailas Dhanraj Deore	SAE INDIA	Member
33	Mr. Nilesh Mohan Shinde	SAE INDIA	Member
34	Dr. Hemant Krishnarao Wagh	Institute of Research Engineers and Doctors (IRED)	Member

35	Mr. Janardan Bhikulal Bhavsar	IAENG (International Association of Engineers)	Member
36	Mr. Yogeshkumar Raghunath Pathak	IAENG (International Association of Engineers)	Member
37	Mr. Anil Hiralal Kumbhar	IFERP (Institute for Engineering Research and Publication)	Member

6.1.2 Faculty as Resource Persons or Participants in STTPs/FDPs (10)

Institute Marks : 5.00

6.1.2.1 Faculty as Resource Persons in STTPs/FDPs (5)

**Table No. 6.1.2.1: List of faculty members as resource person in STTP/FDP events.
(CAYm1) 2024-25**

S.No	Name of the Faculty as Resource Person	Name of the STTP/FDP	Date (DD/MM/YYYY)	Location	Organized by
1	Dr. Hemant Krishnarao Wagh	Manufacturing Management and Lean Manufacturing	27-31 Jan 2025	Nagpur Maharashtra, India	St. Vincent Pallotti College of Engineering & Technology (SVP CET)
2	Mr. Rohan Rajendra Ozarkar	Manufacturing Management and Lean Manufacturing	27-31 Jan 2025	Nagpur Maharashtra, India	St. Vincent Pallotti College of Engineering & Technology (SVP CET)
3	Mr. Sarode Pravin Laxmanrao	One Week FDP on OBE Awareness and NBA new Norms	7-12 April 2025	Ramtek Maharashtra, India	Kavikulguru Institute of Technology and Science (KITS)
4	Dr. Saner Kapil Ashok	One Week FDP on OBE Awareness and NBA new Norms	7-12 April 2025	Ramtek Maharashtra, India	Kavikulguru Institute of Technology and Science (KITS)

(CAYm2) 2023-24

S.No	Name of the Faculty as Resource Person	Name of the STTP/FDP	Date (DD/MM/YYYY)	Location	Organized by
1	Dr. Patil Pandit Subhash	Energy Conservation and Management	18-23 Dec 2023	Ramtek Maharashtra, India	Kavikulguru Institute of Technology and Science (KITS)
2	Mr. Shinde Nilesh Mohan	Energy Conservation and Management	18-23 Dec 2023	Ramtek Maharashtra, India	Kavikulguru Institute of Technology and Science (KITS)
3	Mr. Yeole Sunil Vasudev	Renewable Energy Sources alone solar, Hydrogen and Bio mass	22-27 April 2024	Nagpur, Maharashtra, India	Suryodaya College of Engineering & Technology (SCET)
4	Mr. Patil Bhushan Youraj	Renewable Energy Sources alone solar, Hydrogen and Bio mass	22-27 April 2024	Nagpur, Maharashtra, India	Suryodaya College of Engineering & Technology (SCET)

(CAYm3) 2022-23

S.No	Name of the Faculty as Resource Person	Name of the STTP/FDP	Date (DD/MM/YYYY)	Location	Organized by
1	Dr. Nitin Girdhar Shinde	Sustainable Development design and Life cycle management	21-26 Nov 2022	Nagpur, Maharashtra, India	Suryodaya College of Engineering & Technology (SCET)
2	Mr. Jamadar Pradip Darbarsing	Sustainable Development design and Life cycle management	21-26 Nov 2022	Nagpur, Maharashtra, India	Suryodaya College of Engineering & Technology (SCET)
3	Dr. Wagh Hemant Krishnarao	FDP on IPR	13-20 April 2023	Raipur, Chhattisgarh, India	MATS University
4	Mr. Sarode Pravin Laxmanrao	FDP on IPR	13-20 April 2023	Raipur, Chhattisgarh, India	MATS University

Name of the faculty	Max 5 Per Faculty		
	2024-25(CAYm1)	2023-24(CAYm2)	2022-23(CAYm3)
Dr. Pravin Laxmanrao Sarode	5.00	5.00	5.00
Mr. Manoj Rajan Patil	5.00	5.00	5.00
Dr. Hemant Krishnarao Wagh	5.00	5.00	5.00
Dr. Kapil Ashok Saner	5.00	5.00	5.00
Dr. Kiran Dinkar Chaudhari	5.00	5.00	5.00
Mr. Sunil Vasudeo Yeole	5.00	5.00	5.00
Dr. Pandit Subhash Patil	5.00	5.00	5.00
Mr. Anil Hiralal Kumbhar	5.00	5.00	5.00
Mr. Juber Ahamad Mo. Salim Khatik	5.00	5.00	5.00
Dr. Bhushan Youraj Patil	5.00	5.00	5.00
Dr. Pradip Darbarsing Jamadar	5.00	5.00	5.00
Dr. Pankaj Valmik Baviskar	5.00	5.00	5.00
Dr. Pradip Kailas Patil	5.00	5.00	5.00
Mr. Yogeshkumar Raghunath Pathak	5.00	5.00	5.00
Dr. Rahul Dilip Sandhanshiv	0.00	5.00	5.00
Mr. Kailas Dhanraj Deore	5.00	5.00	5.00
Mr. Nilesh Arun Patil	5.00	5.00	5.00
Mr. Nilesh Mohan Shinde	5.00	5.00	5.00
Dr. Nitin Girdhar Shinde	5.00	5.00	5.00
Mr. Rohan Rajendra Ozarkar	5.00	5.00	5.00
Mr. Sachin Nana Pawar	5.00	0.00	0.00
Sum	100.00	100.00	100.00

RDF = Number of faculty required to comply with the 20:1 student - faculty ratio in the Department alone, as per section 5.1 of SAR(RDF= DS / 20).	9.90	9.90	13.20
Assessment Points (AP)= (Sum/(0.5* RDF)) (Points limited to 5 for each assessment year)	5.00	5.00	5.00

Average assessment over 3 years: 5.00

6.1.3 Faculty Contribution in Development of SWAYAM MOOCs and other E-Content (7)

Institute Marks : 5.00

Table No. 6.1.3.1: List of faculty members developed MOOC course for the past 3 years.

S.No	Name of the Faculty	Name of the Course Developed and available online on Swayam platform by your Department faculty
1	Dr. Pravin L Sarode	YouTube: https://www.youtube.com/@pravinsarode3334
2	Mr. Manoj Rajan Patil	YouTube: https://www.youtube.com/@manojpatil6374
3	Dr. Hemant Krishnarao Wagh	YouTube:- https://youtube.com/@dr.hemantwagh?si=a9MdLo0gChctgw
4	Dr. Kapil Ashok Saner	YouTube: https://www.youtube.com/@kapilsaner7835
5	Mr. Kiran Dinkar Chaudhari	YouTube: https://YouTube.com/@kiranchaudhari1893?si=FB_PFUbnk5RPuzTt
6	Mr. Sunil Vasudeo Yeole	YouTube: https://www.youtube.com/@sunilyeole7632
7	Dr. Pandit Subhash Patil	YouTube: https://www.youtube.com/@panditpatil4353
8	Mr. Anil Hiralal Kumbhar	YouTube:- https://www.youtube.com/@anil2999
9	Mr. Juber Ahamad Mo. Salim Khatik	YouTube: https://www.YouTube.com/@juberahamad5419
10	Dr. Bhushan Youraj Patil	Word press: http://bhushanpatilsai15.wordpress.com
11	Dr. Bhushan Youraj Patil	YouTube: https://www.YouTube.com/@bhushanpatil9862
12	Mr. Pradip Darbarsing Jamadar	YouTube: https://www.youtube.com/@pradipjamadar7112
13	Mr. Pankaj Valmik Baviskar	YouTube: https://youtube.com/@pankajpatil-yu3zt?si=AWLL9-_1xv4JxkoH
14	Dr. Pradip Kailas Patil	YouTube: https://www.youtube.com/@pradip2141
15	Mr. Yogeshkumar Raghunath Pathak	YouTube: https://www.YouTube.com/@yogeshpathak123
16	Mr. Kailas Dhanraj Deore	YouTube: https://www.YouTube.com/@kailasdhanrajdeore2773
17	Mr. Nilesh Arun Patil	YouTube: https://www.youtube.com/@nileshpatil7267
18	Mr. Nilesh Mohan Shinde	YouTube: https://www.YouTube.com/@nileshshinde8773
19	Dr. Nitin Girdhar Shinde	YouTube: https://www.youtube.com/@nitingirdharshinde640
20	Mr. Rohan Rajendra Ozarkar	YouTube: https://youtube.com/@rohanozarkar07?si=R_1scF9meehwjSGH
21	Mr. Rohan Rajendra Ozarkar	Website: https://sites.google.com/view/ozromsm?usp=sharing
22	Mr. Sachin Nana Pawar	YouTube: https://youtube.com/@sachin_pawar18?si=Ucxss5KbXULjErtV

6.1.4 Faculty Certification of MOOCs through SWAYAM, etc. (8)

Institute Marks : 10.00

Table No. 6.1.4.1: List of faculty members obtained certification of MOOCs for the past 3 years.

S.No	Name of the Faculty	Name of Course Passed	Course Offered by (agency)	Grade obtained if any
1	Mr. Sunil Vasudeo Yeole	Python for Data Science	IIT Madras	0.6
2	Mr. Sunil Vasudeo Yeole	Data Science for Engineers	IIT Madras	0.65
3	Mr. Sunil Vasudeo Yeole	Introduction to Machine Learning	IIT Madras	0.55
4	Mr. Nilesh M Shinde	AI/ML for Geodata Analysis	ISRO	Pass
5	Mr. Nilesh M Shinde	Fundamentals of Deep Learning	NVIDIA	Pass
6	Mr. Rohan R Ozarkar	Fundamentals of Deep Learning	NVIDIA	Pass
7	Mr. Rohan R Ozarkar	Database Management System	CodeChef	Pass
8	Dr. Hemant Krishnarao Wagh	Fundamentals of Deep Learning	NVIDIA	Pass
9	Mr. Pradip Darbarsing Jamadar	Fundamentals of Deep Learning	NVIDIA	Pass
10	Mr. Pradip Darbarsing Jamadar	AI/ML for Geodata Analysis	ISRO	Pass
11	Mr. Pradip Darbarsing Jamadar	Overview of Geographical Information System	ISRO	Pass
12	Mr. Chaudhari Kiran Dinkar	Tableau Training	SimpliLearn	Pass
13	Mr. Jamadar Pradip Darbarsing	Sales forced Admin Certification Course	Udemy	Pass
14	Mr. Kumbhar Anil Hiralal	Fundamentals I Metadata Pipeline Certification	FI 23, Chicago IL 60611, United States	Pass
15	Mr. Ozarkar Rohan Rajendra	Preparing Data for Analysis with Microsoft Excel	Microsoft and Coursera	Pass
16	Mr. Ozarkar Rohan Rajendra	Extract, Transform and Load Data in Power BI	Microsoft and Coursera	Pass
17	Mr. Ozarkar Rohan Rajendra	Agile with Atlassian Jira	Atlassian and Coursera	Pass
18	Mr. Patil Pradip Kailas	Sales forced Admin Certification Course	Udemy	Pass
19	Mr. Patil Pradip Kailas	The complete C programming Bootcamp	Udemy	Pass
20	Mr. Patil Pradip Kailas	Learn JAAVA Programming	Udemy	Pass
21	Mr. Anil H Kumbhar	Electrical vehicle and mobility	Paris tech	Pass
22	Mr. Jamadar Pradip Darbarsing	Organic Solar Cells - Theory and Practice	Technical University of Denmark	Pass
23	Mr. Jamadar Pradip Darbarsing	Wind Energy	Technical University of Denmark	Pass
24	Mr. Jamadar Pradip Darbarsing	Solar Energy and Electrical System Design	University at Buffalo	Pass
25	Mr. Jamadar Pradip Darbarsing	Our Energy Future	University of California San Diego	Pass
26	Mr. Jamadar Pradip Darbarsing	Fundamentals of Global Energy Business	University of Colorado System	Pass
27	Mr. Jamadar Pradip Darbarsing	Advanced Manufacturing Process Analysis	University at Buffalo	Pass
28	Dr. Wagh Hemant Krishnarao	Introduction to Business Analysis Using Spreadsheets: Basics	Coursera Project Network	Pass
29	Dr. Wagh Hemant Krishnarao	Introduction to Artificial Intelligence (AI)	IBM	Pass
30	Dr. Wagh Hemant Krishnarao	Autodesk Fusion 360 Integrated CAD/CAM/CAE	Autodesk	Pass
31	Dr. Wagh Hemant Krishnarao	Brand and Product Management	ie Reinventing higher Education	Pass
32	Dr. Wagh Hemant Krishnarao	Electric Vehicles and Mobility	Paris tech	Pass
33	Dr. Wagh Hemant Krishnarao	Intro to Digital Manufacturing with Autodesk Fusion 360	Autodesk	Pass
34	Dr. Wagh Hemant Krishnarao	Python and Statistics for Financial Analysis	Hong Cong university of science and technology	Pass

35	Dr. Wagh Hemant Krishnarao	Wind Energy	Technical University of Denmark	Pass
36	Mr. Patil Pradip Kailas	Advanced Manufacturing Enterprise	The State University of New York	Pass
37	Mr. Patil Pradip Kailas	Advanced Manufacturing Process Analysis	The State University of New York	Pass
38	Mr. Patil Pradip Kailas	Digital Thread: Implementation	The State University of New York	Pass
39	Mr. Patil Pradip Kailas	Generative Design for Additive Manufacturing	Autodesk	Pass
40	Mr. Patil Pradip Kailas	Intelligent Machining	The State University of New York	Pass
41	Mr. Khatik Juber Ahamad Mo. Salim	Solar Energy Codes, Permitting and Zoning	University at Buffalo	Pass
42	Mr. Khatik Juber Ahamad Mo. Salim	Energy- The Enterprise	University at Buffalo	Pass
43	Mr. Khatik Juber Ahamad Mo. Salim	Fundamentals of Global Energy Business	University of Colorado System	Pass
44	Mr. Khatik Juber Ahamad Mo. Salim	Mechanics: Motion, Forces, Energy and Gravity, from Particles to Planets	UNSW Sydney (The University of New South Wales)	Pass
45	Mr. Khatik Juber Ahamad Mo. Salim	Our Energy Future	University of California San Diego	Pass
46	Mr. Khatik Juber Ahamad Mo. Salim	Safety in the Utility Industry	University at Buffalo	Pass
47	Mr. Khatik Juber Ahamad Mo. Salim	Solar Energy and Electrical System Design	University at Buffalo	Pass
48	Mr. Shinde Nilesh Mohan	Natural Gas	The State University of New York	Pass
49	Mr. Shinde Nilesh Mohan	Solar Energy System Design	The State University of New York	Pass
50	Mr. Shinde Nilesh Mohan	Solar Energy and Electrical System Design	University at Buffalo	Pass
51	Mr. Shinde Nilesh Mohan	Solar Energy Codes, Permitting and Zoning	University at Buffalo	Pass
52	Mr. Shinde Nilesh Mohan	Our Energy Future	University of California San Diego	Pass
53	Mr. Shinde Nilesh Mohan	Organic Solar Cells - Theory and Practice	Technical University of Denmark (DTU)	Pass
54	Mr. Shinde Nilesh Mohan	Safety in the Utility Industry	The State University of New York	Pass
55	Mr. Shinde Nilesh Mohan	Fundamentals of Global Energy Business	University of Colorado	Pass
56	Mr. Ozarkar Rohan Rajendra	Databases for Data Scientists Specialization	University of Colorado Boulder	Pass
57	Mr. Ozarkar Rohan Rajendra	Google Data Analytics Professional Certificate	Google	Pass
58	Mr. Bhushan Y Patil	Salesforce Sales Operations	Coursera	Pass
59	Mr. Bhushan Y Patil	Salesforce Basics	University of California,	Pass
60	Mr. Bhushan Y Patil	Sales and CRM Overview	Coursera	Pass
61	Mr. Sunil Vasudeo Yeole	Organic Solar Cells - Theory and Practice	Technical University of Denmark	Pass
62	Mr. Sunil Vasudeo Yeole	Mechanics: Motion, Forces, Energy and Gravity, from Particles to Planets	UNSW Sydney	Pass
63	Mr. Sunil Vasudeo Yeole	Wind Energy	Technical University of Denmark	Pass

Table No. 6.1.5.1: List of FDPs/STPs organized by Department for the past 3 years.**(CAYm1) 2024-25**

S.No	Name of the Program	Date of the Program(DD/MM/YYYY)	Duration	Name of the Speaker & Designation and Organization	No. of People Attended
1	Innovations in Thermal Engineering, Renewable Energy, and Advanced Manufacturing	19/05/2025	One Week	Mr. Nitin Padghan, Assistant Professor, Dr. Nitin Sawarkar, Assistant Professor	32
2	Integrated Approaches in Design, Simulation, and Advanced Manufacturing Technologies	08/07/2024	One Week	Dr. H. K. Dube, Assistant Professor, Mr. Manjeet Gajbhiye, Assistant Professor	37

(CAYm2) 2023-24

S.No	Name of the Program	Date of the Program(DD/MM/YYYY)	Duration	Name of the Speaker & Designation and Organization	No. of People Attended
1	Advances in Mechanical Engineering: Synergy of Design, Thermal Engineering, Manufacturing and materi	01/08/2023	One Week	Dr. V. G. Parhate, Associate Professor, Mr. Amit Banker, Assistant Professor	31
2	Industry-Oriented Design and Simulation Practices for Mechanical Engineering Applications	25/12/2023	One Week	Dr. D C Katpatal, Associate Professor, Mr. Ketan Tonpe, Assistant Professor	35

(CAYm3) 2022-23

S.No	Name of the Program	Date of the Program(DD/MM/YYYY)	Duration	Name of the Speaker & Designation and Organization	No. of People Attended
1	Multidisciplinary Perspectives on CFD, Renewable Energy, and Advanced Manufacturing Systems	22/08/2022	One Week	Mr. Nitin Padghan, Assistant Professor, Dr. C. N. Sakhale, Associate Professor	33
2	Emerging Trends in Mechanical Design Innovation Thermal Management Advanced Manufacturing and Materi	09/01/2023	One Week	Dr. Y M Jibhakate, Associate Professor, Dr. V. G. Parhate, Associate Professor	35

6.1.6 Faculty Support in Student Innovative Projects (10)

Institute Marks : 10.00

Table No. 6.1.6.1: List of faculty members involved in student innovative projects.

(CAYm1) 2024-25

S.No	Name of the Faculty	Name of the Event	Date of the Event(DD/MM/YYYY)	Place of Event	Website Link if any
1	Mr. Shinde Nilesh Mohan	Smart India Hackathon	11/12/2024	Coimbatore, Tamilnadu	https://www.sih.gov.in/sih2024 List of Students 1. Chetan Patil 2. Ujjwal Jadhav 3. Pritesh Koli
2	Mr. Shinde Nilesh Mohan	College Youth Ideathon	05/04/2025	IIT Delhi	https://youthideathon.in/
3	Dr. Bhushan Youraj Patil	College Youth Ideathon	05/04/2025	IIT Delhi	https://youthideathon.in/

(CAYm2) 2023-24

S.No	Name of the Faculty	Name of the Event	Date of the Event(DD/MM/YYYY)	Place of Event	Website Link if any
1	Mr. Bhushan Youraj Patil	IEEE YESIST12 Team Multimanics	05/04/2024	Budge Budge Institute of Technology kolkata	NA
2	Mr. Bhushan Youraj Patil	AAKRUTI Global-Design Contest Shaping Imagination 2024, By Dassult Systems	18/05/2024	Dassult Systems Pune	https://www.solidworks.com/product/students/aakruti-global?utm_source

(CAYm3) 2022-23

S.No	Name of the Faculty	Name of the Event	Date of the Event(DD/MM/YYYY)	Place of Event	Website Link if any
1	Dr. Hemant K Wagh	Agriculture Multipurpose Power weeder Machine	02/01/2023	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	https://msins.in/
2	Mr. Bhushan Youraj Patil	AIRC-2023 SEASON 6 Kart-Kaizen	02/01/2023	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	https://msins.in/
3	Mr. Nilesh Mohan Shinde	ARRAVALI TERRAIN VEHICLE CHAMPIONSHIP (ATVC) 2023	02/01/2023	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	https://msins.in/
4	Mr. Pradip Darbarsing Jamadar	Design and Development of plastic recycling machine	02/01/2023	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	https://msins.in/
5	Mr. Bhushan Youraj Patil	Colour Emitting Device	02/01/2023	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	https://msins.in/
6	Mr. Nilesh Mohan Shinde, Kailas Dhanraj Deore	E-Baja	05/04/2023	Chitkara University Baddi Himachal Pradesh	https://www.bajasaeindia.org/
7	Dr. Hemant Krishnarao Wagh	AIRC-2023 SEASON 6 Kart-Kaizen	25/05/2023	AIRC Wagholi Pune MH	https://autoindiaracing.in/
8	Dr. Rahul Dilip Sadhanshiv	Composite Materials	02/01/2023	Maharashtra Student Innovation Challenge 2023, by MSInS, Govt. of Maharashtra	https://msins.in/
9	Mr. Nilesh Mohan Shinde	ARRAVALI TERRAIN VEHICLE CHAMPIONSHIP (ATVC) 2023	01/03/2023	PCET's Nutan Maharashtra Institute of Engineering & Technology, Pune, Maharashtra	https://atvcofficial.in/atvc_2023

Table No. 6.1.7.1: Faculty internship/training/collaboration details.

S.No	Name of the Faculty	Name of the Internship/ Training/ Collaboration	Name of the Company & Place	Duration	Outcomes of Internship/ Training/ Collaboration
1	Dr. Pravin L Sarode	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
2	Mr. Manoj Rajan Patil	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
3	Dr. Hemant Krishnarao Wagh	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
4	Dr. Kapil Ashok Saner	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
5	Mr. Sunil Vasudeo Yeole	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
6	Dr. Pandit Subhash Patil	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
7	Dr. Bhushan Youraj Patil	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
8	Mr. Pradip Darbarsing Jamadar	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
9	Mr. Nilesh Mohan Shinde	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
10	Mr. Rohan Rajendra Ozarkar	3D Printing	Make3D	2 Day	Enhanced additive manufacturing knowledge
11	Dr. Kapil Ashokrao Saner	AICTE-QIP-PG Certificate Programme on Machine Learning	IIIT Surat	6 Month	Enhanced machine learning expertise
12	Dr. Bhushan Youraj Patil	AICTE-QIP-PG Certificate Programme on High Performance Computing	CDAC, COEP Pune	6 Month	Enhanced high-performance computing knowledge
13	Dr. Hemant K Wagh	AICTE-QIP-PG Certificate Programme on Artificial Intelligence	IIITV-ICD and IIIT Vadodara	6 Month	Advanced practical AI implementation skills
14	Dr. Pradip Subhash Patil	AICTE-QIP-PG Certificate Programme on Artificial Intelligence	IIITV-ICD and IIIT Vadodara	6 Month	Advanced practical AI implementation skills
15	Mr. Anil Hiralal Kumbhar	AICTE-QIP-PG Certificate Programme on Artificial Intelligence	IIITV-ICD and IIIT Vadodara	6 Month	Advanced practical AI implementation skills
16	Mr. Pradip Darbarsing Jamadar	AICTE-QIP-PG Certificate Programme on Artificial Intelligence	IIITV-ICD and IIIT Vadodara	6 Month	Advanced practical AI implementation skills
17	Mr. Nilesh Mohan Shinde	AICTE-QIP-PG Certificate Programme on Artificial Intelligence	IIITV-ICD and IIIT Vadodara	6 Month	Advanced practical AI implementation skills
18	Mr. Ozarkar Rohan Rajendra	AICTE-QIP-PG Certificate Programme on Artificial Intelligence	IIITV-ICD and IIIT Vadodara	6 Month	Advanced practical AI implementation skills
19	Mr. Sunil V Yeole	AICTE-QIP-PG Certificate Programme on Machine Learning	IIIT Surat	06 Month	Developed advanced machine learning skills
20	Mr. Pravin L Sarode	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills

21	Mr. Manoj Rajan Patil	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
22	Dr. Hemant Krishnarao Wagh	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
23	Mr. Kapil Ashok Saner	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
24	Mr. Sunil Vasudeo Yeole	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
25	Dr. Pandit Subhash Patil	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
26	Mr. Anil Hiralal Kumbhar	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
27	Mr. Bhushan Youraj Patil	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
28	Mr. Pradip Darbarsing Jamadar	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
29	Mr. Nilesh Mohan Shinde	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
30	Mr. Rohan Rajendra Ozarkar	Pneumatic and Electro-Pneumatic Training Program	Techno Scientific Company, Wadala, Mumbai	2 Day	Strengthened pneumatic automation teaching skills
31	Mr. Pravin L Sarode	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
32	Mr. Manoj Rajan Patil	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
33	Dr. Hemant Krishnarao Wagh	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
34	Mr. Kapil Ashok Saner	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
35	Mr. Sunil Vasudeo Yeole	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
36	Dr. Pandit Subhash Patil	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
37	Mr. Anil Hiralal Kumbhar	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
38	Mr. Bhushan Youraj Patil	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
39	Mr. Pradip Darbarsing Jamadar	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
40	Mr. Nilesh Mohan Shinde	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise
41	Mr. Rohan Rajendra Ozarkar	Ansys Training	Ark Infosolution Pvt Ltd	2 Day	Enhanced ANSYS simulation expertise

6.2 Research and Development Activities (60)

Total Marks 29.00

6.2.1 Academic Research (10)

Institute Marks : 10.00

Table No. 6.2.1.1: Faculty publication details.

S.No.	Item	2024-25 (CAYm1)	2023-24 (CAYm2)	2022-23 (CAYm3)
1	No. of peer reviewed journal papers published	8	4	2
2	No. of peer reviewed conference papers published	1	1	6
3	No. of books/book chapters published	2	0	0

6.2.2 Ph.D. Student Details (5)

Institute Marks : 5.00

Table No. 6.2.2.1: Ph.D. details.

S.No.	Item	2024-25 (CAYm1)	2023-24 (CAYm2)	2022-23 (CAYm3)
1	No. of students enrolled for Ph.D. in the Department	3	3	3
2	No. of Ph.D. students graduated in the Department	1	0	0

6.2.3 Development Activities (10)

Institute Marks : 10.00

Table No.6.2.3.1: Patent Details

S.N.	Name of Authors	Title of Patent	Application No.	Granted/Published
CAYm1 (2024-25)				
1	Dr. Kapil A Saner, Dr. Hemant Krishnarao Wagh	Automatic water Tank Cleaning Machine	460317-001	28-05-2025 Filed
CAYm2 (2023-24)				
1	Dr. Patil Pandit Subhash	IOT Enabled Evacuated VAC tube type Solar Dryer	202221027566	04-08-2023 Published
CAYm3 (2022-23)				
1	Mr. Kiran Dinkar Chaudhari, Mr. Sunil Vasudeo Yeole Mr. Juber Ahamad Mo. Salim Khatik, Mr. Kapil Ashok Saner, Mr. Bhushan Youraj Patil, Mr. Manoj Rajan Patil	Smart Fertilizer Spraying Machine	367457-001	Granted 08-07- 2022
2	Mr. Sunil Vasudeo Yeole, Mr. Ajay Awate, Mr. Chandrakanr R Patil, Mr. Kapil A. Saner, Mr. Kiran Dinkar Chaudhari,	Solar Dimple Collector	367917-001	Granted 18-07- 2022
3	Dr. Wagh Hemant Krishnarao	Library Automation through RFID, IoT, and AI: A System and Method for Managing Books, Articles, and Journals	202211069521	16/12/2022

Table No.6.2.3.2: Copyright Details

Sr No	Name of the Applicant	Name of Co-authors	Title of Copyright	Diary Number	Application No./Registration number	Application Date	Published/Granted Date
CAYm1 (2024-25)							
1	Mr. Rohan Rajendra Ozarkar		Electrolysis Nickel Coating of Carbon Fibre Rod for Effective Reinforcement in Aluminium MMC for Using in Automobile Application	27138/2024-CO/L	L-158082/2024	29/08/2024	10/12/2024
2	Mr. Bhushan Youraj Patil	Mr. kiran Chaudhari, Dr. Nilesh Salunke, Ms. Gayatri Patil	Characterization of Different Concentration Ratio of Al ₂ O ₃ /C ₆ H ₆ O ₂ Phase Change Materilas for Solar Absorption Refrigeration	34683/2024-CO/L	L-158082/2024	24/11/2024	Status Pending Hearing
CAYm2 (2023-24)							
1	Mr. Saner Kapil Ashokrao	Dr. Sanjay P Shekhawat	Cooling Solutions for Poultry: A Modified House Design with Misting Technology in Tropical Climates	29601/2023-CO/L	L-140092/2023	8 Nov 2023	29 Dec 2023

S r n o	Name of the Applicant	Name of Co- authors	Title of Copyright	Diary Number	Applicati on No./ Registrati on number	Applicati on Date	Publish ed/ Granted Date
2	Mr. Kiran Dinkar Chaudha ri	Dr. Nilesh Salunke, Dr V R Diware	Performance Evaluation of a diesel engine fuelled with Biodiesel Doped with Green Synthesized Calcium Oxide Nanoparticle s	9202/202 4-CO-L	L- 148371/2 024	26/03/20 24	29/05/20 24
3	Dr. Rahul Dilip Sandans hiv	Mr. Kailas D. Deore, Yogeshku mar R. Pathak, Dr. Nitin G. Shinde	Specimen preparation for ACM/Edax analysis		L- 124775/2 023		
CAYm3 (2022-23)							
1	Mr. Rohan Rajendra Ozarkar		Design Complaint Displacement Amplification Mechanism (VRUDHHI)	4011/202 3-CO/L	L- 124248/2 023	15/02/20 23	

Table No.6.2.3.3: Working Models/Prototype Details

S. N.	Name of Working Models/Prototype	Name of Students	Name of Faculty	Domain
CAY (2025-26)				
1	Experimental investigation and machine learning optimization of solar air heater efficiency with different blockage ratios and configurations	Patil Ninad Chandrashekh ar Pawar Surajsinh Kishorsinh Tatar Pranav Nitin Mali Bhavesh Mohan	Mr. N M Shinde	Thermal Engineering & Energy Systems

S. N.	Name of Working Models/Prototype	Name of Students	Name of Faculty	Domain
2	Material Assistant Robot	Pawar Yash Meghraj	Mr. Pradip Darbarsing Jamadar	Robotics, Control & Industrial Automation
		Patil Mayur Ravindra		
		Rajput Bhagesh Chandrakant		
		Rajput Krushna Nimbasingh		
3	Experimental Investigation of Solar Air Dryer with Rectangular Duct with Different Blockage Ratio Ribs and Predict the Efficiency through Machine Learning Model	Mahajan Nikitesh Dharmendra	Dr. Kapil Ashokrao Saner	Thermal Engineering & Energy Systems
		Makhija Kirtan Dilip		
		Nikam Rahul Sanjay		
		Mahule Chetan Pradeep		
4	Experimental Investigation of Solar Stills Using Phase Change Material	Khairnar Dhananjay Dinesh	Mr. Manoj Rajan Patil	Thermal Engineering & Energy Systems
		Jadhav Shreyanshu Vijay		
		Yawalkar Aishwarya Mahesh		
		Borase Meghana Prabhakar		
		Dhodare Shubham Rajendra		
5	Optimizing Ceiling fan Noise through Blade Modification	Patil Hitesh Sunil	Mr. Manoj Rajan Patil	Thermal Engineering & Energy Systems
		Patil Parth Sanjay		
		Patil Durgesh Mahendra		
		Patil Chetan Ravindra		

S. N.	Name of Working Models/Prototype	Name of Students	Name of Faculty	Domain
6	CFD Analysis of Solar ETC using Energy storage	Patil Gaurav Shravan	Dr. Bhushan Youraj Patil	Thermal Engineering & Energy Systems
		Chaudhari Siddhesh Vijay		
		Patil Nikhil Anil		
		Patil Jayesh Dipak		
7	Design and Fabrication of vertical axis Wind Mill Power Generation System or House hold application	Nerkar Saurabh Sunil	Mr. Sunil Vasudeo Yeole	Environmental Engineering & Sustainable Technologies / Renewable Energy Systems
		Nikum Pritesh Jitendra		
		Nikam Chetan Pankaj		
		Jadhav Ujwal Narendrasing		
8	IOT based Automatic agriculture pesticide spray robot	Saner Sachin Kishor	Dr. Kapil Ashokrao Saner	AI & IoT Integrated Systems
		Kapadi Gaurav Deelip		
		Girase Digvijaysing Khumansing		
		Bhandari Tilok Mahendra		
9	Design and Fabrication of an Automated Cotton Wick Making Machine	Girase Tejas Pradipsing	Mr. Rohan Rajendra Ozarkar	Materials Engineering, Manufacturing Processes & Production Systems
		Mahajan Bhavesh Ravindra		
		Badgujar Jaydip Tukaram		
		Warude Chetan Dnyaneshwar		
10	Development and Fabrication of an Automatic waste Segregation system	Sali Mayur Jagdish	Dr. Pandit Subhas Patil	Environmental Engineering & Sustainable Technologies / Renewable Energy Systems
		Pawara Sagar Chandrasingh		
		Chaudhari Dhananjay Jadhav		

S. N.	Name of Working Models/Prototype	Name of Students	Name of Faculty	Domain
11	Experimental Investigation of Solar ETC (Evacuated tube collector) Based Energy storage Using Phase Change Material	Pawar Rohit Harekrishna Patil Sachin Vinod Salunkhe Piyush Jitendra Suryvanshi Hitesh Vishwas	Dr. Bhushan Youraj Patil	Thermal Engineering & Energy Systems
12	Smart Material Handling System	Wagh Kalyani Bharat Sonawane Tejswini Ramesh Chaudhari Devyani Sunil Patil Ankit Santosh Girase Vishal Jitendrasing	Dr. Pandit Subhas Patil	AI & IoT Integrated Systems
13	Utilization of Fused Deposition Modelling on The Production of Poly-lactic Acid Bone structure(Wrist Brace)	Salunkhe Sushant Deepak Badgujar Vaibhav Yashwant Sonawane Lavkesh Subhash Bhadane Pundlik Maruti	Dr. P D Jamadar	Materials Engineering, Manufacturing Processes & Production Systems
14	Fire Fighter Drone	Kumbhar Sanket Gopal	Dr. Tushar H. Jaware and Mr. N M Shinde	AI & IoT Integrated Systems
15	Solar-Based Cold-Water ATM	Patil Rushikesh Sunil	Dr. P G Patil and Mr. N M Shinde	Thermal Engineering & Energy Systems

S. N.	Name of Working Models/Prototype	Name of Students	Name of Faculty	Domain
16	Optimization of 3D printing parameters using Taguchi and SN rasion for PLA material	Mohit Manoj Marathe	Mr. Rohan Rajendra Ozarkar	Materials Engineering, Manufacturing Processes & Production Systems
		Tanmay Nitin Mahajan		
		Jaykumar Dipak Kasar		
		Vaishnavi Sunil Patil		
17	Industrial Project-3D Modelling and drafting of special fastener	Suchita Mahendra Badgujar	Dr. Hemant Krishnarao Wagh	Design and Analysis
		Nikita Santosh Gosavi		
		Pratiksha Chandulal Koli		
		Pradip Gopal Savande		
CAYm1 (2024-25)				
1	Design and Analysis of Double Pass Solar Air Heater with Different Ribs Surfaces	Mali Dipak Dnyaneshwar	Mr. Nilesh Mohan Shinde	Thermal Engineering & Energy Systems
		Patil Divyesh Ravindra		
		Koli Abhishek Ravindra		
		Sonawane Lavkesh Subhash		
2	Seed Sowing Machine	Girase Sumit Mahendrasing	Mr. Sunil Vasudeo Yeole	Robotics, Control & Industrial Automation
		Girase Kalpesh N.		
		Koli Mayur Gopal		
		Tribhuvan Dhiraj Dilip		
		Kumbhar Prashant R		

S. N.	Name of Working Models/Prototype	Name of Students	Name of Faculty	Domain
3	Smart Dustbin: A Prototype for Intelligent Waste Management	Fartade Rakshita Amar Kulkarni Shweta Ravindra Sonawane Vedmayi Dilip Ahire Sneha Raju	Mr. Sunil Vasudeo Yeole	Environmental Engineering & Sustainable Technologies / Renewable Energy Systems
4	Solar Based Cold water ATM	Lohar Kinjal Abhay Gajanan Tomar Patil Sumit Balasaheb Patil Chetan Hariklal Patil Rushikesh Sunil	Dr. Prashant G Patil	Thermal Engineering & Energy Systems
5	Development of a solar-powered motorized scarecrow with continuous frequency emission for eco-friendly crop protection	Patil Lalit Dnyaneshwar Tejas Sudam Karankal Aakash Bhagvan Patil Yogesh Ishwar Bhoi	Mr. Nilesh Mohan Shinde	Environmental Engineering & Sustainable Technologies / Renewable Energy Systems
6	Design and Fabrication of Foot Massage Machine	Koli Hemraj Pandharinath Sisodiya Mohit Jaydeepsing Patil Himanshu Sanjay Gujarathi Kartik Harshad Patil Vaibhav Supadu	Mr. Pradip Darbarsing Jamadar	Design and Analysis

S. N.	Name of Working Models/Prototype	Name of Students	Name of Faculty	Domain
7	Temperature Measurement of Solar Evacuated tube collector with PCM using a Data Logger.	Sali Mayur Jagdish	Mr. Bhushan Y Patil	Thermal Engineering & Energy Systems
		Salunkhe Piyush Jitendra		
		Salunkhe Harshal Vishwas		
		Suryawanshi Hitesh Vishwas		
8	Design and Fabrication of Radiator Fins	Kumbhar Sanket Gopal	Mr. Sunil Vasudeo Yeole	Thermal Engineering & Energy Systems
		Mahajan Nikitesh Dharmendra		
		Mahule Chetan Pradeep		
		Makhija Kirtan Dilip		
CAYm2 (2023-24)				
1	Design and Fabrication of Solar Assisted Thermal Storage System	Pimpariya Anurag Rajesh	Mr. Bhushan Y Patil	Thermal Engineering & Energy Systems
		Patil Kirti Pravin		
		Patil Yash Suryabhan		
		Suryavanshi Om Nimba		
2	Development of Smart Helmet Using IOT	Chavan Sagar Vasant	Mr. Rohan Rajendra Ozarkar	AI & IoT Integrated Systems
		Sapkale Vishal Parshuram		
		Nikam Sakshi Sunilrao		

S. N.	Name of Working Models/Prototype	Name of Students	Name of Faculty	Domain
3	Design and Fabrication of Handheld Vacuum Cleaner	Jadhav Himanshu Gajendrasing Patil Chaitanya Sunil Nerkar Saurabh Sunil Jadhav Mayur Padmakar	Mr. Sunil Vasudeo Yeole	Design and Analysis
4	Characterization of Natural Fibers	Pawar Yash Meghraj Patil Mayur Ravindra Rajput Bhagesh Chandrakant Rajput Krushna Nimbasing	Mr. Pradip Darbarsing Jamadar	Materials Engineering, Manufacturing Processes & Production Systems
5	Agriculture Multipurpose Power Weeder Machine	Patil Kalpesh Pankaj Shukla Shubham Subhash Patil Prathmesh Chandrakant Dhole Sandip Gulabrao	Dr. Hemant Krishnarao Wagh	Automotive Engineering, Vehicle Dynamics & Mechatronic Systems
6	Design & fabrication of Fatigue testing machine	Chaudhari Varun Gunwant Bagal Aaditya Jagdish Chaudhari Hitesh Jitendra Savant Manish Laxman	Mr. Sunil V. Yeole	Materials Engineering, Manufacturing Processes & Production Systems

S. N.	Name of Working Models/Prototype	Name of Students	Name of Faculty	Domain
7	Prototype Development of a Smart Dustbin	Fartade Rakshita Amar	Mr. Sunil V. Yeole	Design and Analysis
		Kulkarni Shweta Ravindra		
		Sonawane Vedmayi Dilip		
		Ahire Sneha Raju		

2024-25 (CAYm1)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25
Dr. Hemant Wagh	Mr. Pradip D. Jamdar	Mechanical Engineering	3D Modelling and Drafting of regular and special Fasteners	V. V. Industries C-2/306, GIDC Shanker Tekary Udhyanagar, Jamnagar – 361004 Gujarat – India	06 Month	0.56
Dr. Hemant Wagh	Mr. Nilesh M. Shinde	Mechanical Engineering	Design, fabrication and implementation of belt conveyor for Shri. Ganesh Visarjan at Arunavati river	Astiva Foundation Janak Villa, Ramsing Nagar, Shirpur, Dist. Dhule, MH 425405	06 Month	0.45
						Amount received (Rs.):1.01

2023-24 (CAYm2)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25
Mr. Sunil V. Yeole	Mr. Nilesh M. Shinde	Mechanical Engineering	Performance analysis of Battery cooling system	MWS Motorsport Solutions 57, Badgujar Colony, Deopur, Dhule, Maharashtra, India.	06 Month	0.52
Dr. Hemant K. Wagh	Mr. Bhushan Y. Patil	Mechanical Engineering	Thermal Management of Solar Photovoltaic through phase change material to improve the performance and power generation	Sun Valley Solar Technologies, Infront of Jaiswal hotel, Nandurbar Chaufuli Dondaicha	06 Month	0.54
Mr. Bhushan Y. Patil	Dr. Pandit S. Patil	Mechanical Engineering	Design and Fabrication of Solar Assisted Thermal Storage System	Neesha Electronics E-52, MIDC, Avdhan, Dhule – 424006, Maharashtra, India.	06 Month	0.57
						Amount received (Rs.):1.63

2022-23 (CAYm3)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25
Mr. Sunil V Yeole	Dr. Hemant Wagh	Mechanical Engineering	Optimization of Biogas Desulfurization for Efficient Generator Performance	Zero Emission Energy East 519, Siddharaj Z Square, Opp. Landmark, KUDASAN, GANDHINAGAR, India.	1 Year	1.10
						Amount received (Rs.):1.10

Total Amount (Lacs) Received for the Past 3 Years: 3.74

Note*:

- Only sponsored research projects will be considered. Infrastructure-based projects will not be considered here.

6.2.5 Consultancy Work (15)

Institute Marks :

2024-25 (CAYm1)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25

2023-24 (CAYm2)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25

2022-23 (CAYm3)

PI Name	Co-PI names if any	Name of the Dept., where project is sanctioned	Project Title*	Name of the Funding agency	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25

Total amount (Lacs) received for the past 3 years:

Note*:

- Only consultancy projects will be considered. Infrastructure-based projects will not be considered here.

6.2.6 Institution Seed Money or Internal Research Grant to its Faculty for Research Work(5)

6.2.6 A Amount received (3)

Institute Marks : 1.00

2024-25 (CAYm1)

Faculty name	Project title/ Support for Activity	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25	Amount Utilized(Lacs) i.e. 15,25,000=15.25	Outcomes of the project
Mr. Pradip D. Jamadar	Fire-Retardant False Ceiling Material from Coconut Shell Powder Reinforced PLA	1 Year	0.36	0.32	Paper published in Journal of SSRG International Journal of Mechanical Engineering (IJME) E-ISSN 2348-8360
Mr. Bhushan Youraj Patil	Performance Study of Solar Absorption Refrigeration Using PCMs	1 Year	0.36	0.34	Paper published in Journal of International Journal of Green Energy ISSN: 1543-5083
			Amount received (Rs.): 0.72		

2023-24 (CAYm2)

Faculty name	Project title/ Support for Activity	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25	Amount Utilized(Lacs) i.e. 15,25,000=15.25	Outcomes of the project
Mr. Pradip K Patil	VCR System Performance Using Natural Refrigerant and Nano Lubricant	1 Year	0.36	0.34	Paper published in Journal of Migration Letters e-ISSN: 1741-8992
Mr. Pravin L Sarode	Analysis of Vehicle Accidents with Safety Parameter Evaluation	1 Year	0.36	0.34	Paper published in Journal of Materials Today: Proceedings ISSN: 2214-7853
			Amount received (Rs.): 0.72		

2022-23 (CAYm3)

Faculty name	Project title/ Support for Activity	Duration of the project	Amount(Lacs) i.e. 15,25,000=15.25	Amount Utilized(Lacs) i.e. 15,25,000=15.25	Outcomes of the project
Mr. Sunil V. Yeole	Performance Analysis and Optimization of Solar Dimple Plate Collector	1 Year	0.36	0.35	Paper published in Journal of Mathematical Statistician and Engineering Applications E-ISSN: 2984-7869
Mr. Kapil A. Saner	Experimental Study of Poultry House Parameters to Reduce Heat Stress	1 Year	0.36	0.34	Paper presented in International Conference on Emerging Trends in Engineering and Technology (ICETET-2022)
			Amount received (Rs.): 0.72		

Total amount (Lacs) received for the past 3 years : 2.16

6.2.6 B Amount utilized (2)

Institute Marks : 2.00

Over the past three academic years, the Department has received ₹2.16 lakhs in internal research funding to support faculty research and innovation activities in new and multidisciplinary mechanical engineering fields.

The departments research ecosystem was strengthened and faculty research projects were successfully carried out thanks to the efficient use of the approved funds. The design, construction, and testing of mechanical systems, the creation of experimental setups, and the prototyping of engineering models were the main mechanical engineering research activities that the utilization supported. Additionally, the funds were utilized to purchase the materials, tools, sensors, mechanical parts, and measurement equipment needed for laboratory-based research projects and experimental investigations.

In fields like thermal engineering, manufacturing, materials, and design engineering, the financial support also made it possible for faculty members to conduct experimental research, modelling and simulation using engineering software, design validation, and performance analysis of mechanical systems and processes.

A portion of the funds were also used for research dissemination activities, such as preparing and publishing research papers in journals and conferences, documenting research findings, and filing intellectual property related to mechanical engineering innovations.

All things considered, the institutes internal funding greatly aided faculty members in carrying out significant research, creating novel mechanical engineering solutions, and contributing to scholarly publications and intellectual property creation, all of which improved the Mechanical Engineering Departments research culture and academic output.

Table No. 6.2.6.1: List of faculty members received seed money or internal research grant from the institution.

S.N.	Faculty name	Project title/ Support for Activity	Duration	Amount (Lacs)	Amount Utilized (Lacs)	Outcomes of the project
CAYm1 2024-2025						
1	Mr. Pradip D. Jamadar	Development of False Ceiling Material from Coconut Shell Powder Reinforced PLA with Improved Fire Retardancy	1 Year	0.36	0.324	Paper published in Journal of SSRG International Journal of Mechanical Engineering (IJME) E-ISSN 2348-8360
2	Mr. Bhushan Youraj Patil	Experimental Investigation of Solar Absorption Refrigeration System Using Phase Change Materials (PCMS)	1 Year	0.36	0.335	Paper published in Journal of International Journal of Green Energy ISSN: 1543-5083
Amount received (Rs.0.72 Lacs)						
CAYm2 2023-2024						
1	Mr. Pradip K Patil	Investigation on Vapour Compression Refrigeration System using Natural Refrigerant and Nano lubricant	1 Year	0.36	0.336	Paper published in Journal of Migration Letters e-ISSN: 1741-8992
2	Mr. Pravin L Sarode	Analysis of vehicle accidents in a parameter of quantitative study and evaluation of safety parameters	1 Year	0.36	0.344	Paper published in Journal of Materials Today: Proceedings ISSN: 2214-7853
Amount received (Rs. 0.72 Lacs)						
CAYm3 2022-2023						
1	Mr. Sunil V. Yeole	Performance Analysis and Optimization of Solar Dimple Plate Collector	1 Year	0.36	0.345	Paper published in Journal of Mathematical Statistician and Engineering Applications E-ISSN: 2984-7869

S.N.	Faculty name	Project title/ Support for Activity	Duration	Amount (Lacs)	Amount Utilized (Lacs)	Outcomes of the project
2	Mr. Kapil A. Saner	Experimental Study of Poultry House Parameters to Reduce Heat Stress	1 Year	0.36	0.338	Paper presented in International Conference on Emerging Trends in Engineering and Technology (ICETET-2022) ISBN : 978-93-92105-02-9
Amount received (Rs. 0.72 Lacs)						
Total amount (Lacs) received for the past 3 years					2.16 Lacs	

7 FACILITIES AND TECHNICAL SUPPORT (100)

Total Marks 100.00

7.1 Adequate and well equipped laboratories, and technical manpower (40)

Total Marks 40.00

Institute Marks : 40.00

Sr. No	Name of the Laboratory	Number of students per set up(Batch Size)	Name of the Important Equipment	Weekly utilization status(all the courses for which the lab is utilized)	Technical Manpower Support		
					Name of the Technical staff	Designation	Qualification
1	ME L-1 Material	20	Computerized	20 Hours/Week	Mrs. Poonam M	Lab Assistant	Diploma Autom
2	ME L-2 Refrige	20	Refrigeration T	14 Hours/Week	Mr. Bhushan V.	Lab Assistant	BE Mechanical
3	ME L-3 Heat T	20	Thermal Condi	14 Hours/Week	Mr. Noaman T	Lab Assistant	M.Tech Mecha
4	ME L-4 Fluid M	20	Bernoulli's The	14 Hours/Week	Mr. Nikhil Kaila	Lab Assistant	Diploma Mech
5	ME L-5 Therm	20	Single & Multi t	14 Hours/Week	Mr. Noaman T	Lab Assistant	M.Tech Mecha
6	ME L-6 Mecha	20	Thermocouple	14 Hours/Week	Mr. Bhushan V.	Lab Assistant	BE Mechanical
7	ME L-7 Workst	64	Lathe, CNC Tu	32 Hours/Week	1. Mr. Hitendr	Workshop Inst	ITI Turner ITI

7.2 Additional Facilities Created for Improving the Quality of Learning Experience in Laboratories (20)

Total Marks 20.00

Sr. No	Name of the Facility	Details	Purpose for creating facility	Utilization	Relevance to POs/PSOs
1	Solar Roof Top System	Grid-connected rooftop solar photovoltaic (PV) system (320KW) installed on the institute building with solar panels, inverter, monitoring unit, and safety accessories.	To promote renewable energy usage, reduce electricity consumption from conventional sources, and create awareness about sustainable energy solutions	Used for power generation for campus electrical loads, student laboratory demonstrations, projects related to renewable energy, energy auditing, and research activities	PO1, PO2, PO3, PO6, PO7, PO11, PO12
2	Experimental Setup for Steam Boiler (Thermal Lab)	Combined Separating and Throttling Calorimeter, Steam pressure: 3 bar	To understand quality of steam and application of thermodynamics	Hands-on experiments, steam quality measurement	PO1, PO2, PO4, PSO1
3	Air Nozzle Apparatus (Thermal Lab)	Convergent / Convergent-Divergent (Interchangeable) with air supply from Compressor and storage tank	To study conservation of mass and energy, pressure-velocity relationship, critical flow condition, discharge coefficient	Used in Thermal Engineering and Fluid Mechanics courses, experiments, semester projects	PO1, PO2, PO4, PO5, PSO1, PSO2
4	Centrifugal Flow Compressor Test Rig (Thermal Lab)	Centrifugal Flow Compressor driven by 2 HP AC Electric Motor	To provide practical exposure to working and performance of centrifugal compressors	Used in Thermal Engineering and Turbo machinery lab courses, experiments, semester projects	PO1, PO2, PO4, PO5, PO6, PSO1
5	Four Stroke Diesel Engine with Variable Compression Ratio (Thermal Lab)	2.5 kW Computerized Test Rig	To study engine performance under varying compression ratios	Performance testing, data acquisition and analysis	PO1, PO2, PO4, PO5, PSO1
6	Experimental Set of Evaporative Cooling Wall for Different Cross Section Profile (Material Science and Metrology Lab)	Experimental setup with evaporative cooling wall having interchangeable cross-section profiles used for measurement of temperature, relative humidity and cooling effectiveness.	To analyze heat and mass transfer characteristics of evaporative cooling systems and study the influence of cross-section geometry on cooling performance.	Laboratory experiments, data collection and analysis, performance comparison, semester projects.	PO1, PO2, PO3, PO4, PO5, PSO1, PSO2
7	Fiber Extraction Machine (Workshop)	Natural Fiber Extraction e.g. Banana fiber, sisal fiber etc.	Natural Composite material Preparations	Used in Natural Composite material Preparations, experiments, semester projects	PO1, PO2, PO3, PO4, PO5, PSO1, PSO2
8	Test Rig for Evaluation of Loosening Performance of Bolted Joint (Workshop)	Design and developed Test rig for M10 Bolted fasteners	Measure Effect of Thickness and Helix Distance or Height of Helical Spring Lock Washers in the Evaluation of Loosening Performance of Bolted Joint	Semester projects, laboratory demonstration and experimental investigations to study the loosening behavior of M10 bolted joints.	PO1, PO2, PO3, PO4, PO5, PO10, PO11, and PO12
9	CNC Program Simulator software (Workshop)	2D Simulation compatible with FANUC-OT	To validate CNC programs before machining	Hands-on CNC program simulation	PO6, PO7, PO9, PO12, PSO1, PSO2

10	Gas Welding Setup (Workshop)	Oxy-Acetylene cylinders, torch, regulators, hoses	To study metal joining processes	Practical training in welding, brazing, soldering	PO7, PO9, PO11, PO12, PSQ2
11	Prototype Models (Dynamics of Machines Lab)	Four-bar, slider-crank and other mechanisms	To visualize and understand mechanism kinematics	Hands-on demonstration of mechanisms	PO9, PO11, PO12, PSO1
12	3D Printer (Workshop)	Build size: 500×500×500 mm, FDM, 1.75 mm filament	To enable rapid prototyping and additive manufacturing	Hands-on printing, semester and BE projects	PO7, PO9, PO11, PO12, PSO1
13	Friction in Journal Bearing Apparatus (Refrigeration and Air-conditioning Lab)	Journal dia.: 49.76 mm, initial load: 20.4 kg, lubricating oil SAE 40	To understand tribological principles in journal bearings	Experiments on friction characteristics, load and speed effect	PO1, PO2, PO3, PO4, PO6, PO7, PSO1, PSO2
14	Michell Tilting Pad Thrust Bearing Apparatus (Refrigeration and Air-conditioning Lab)	6–8 Pads, Babbitt lined, mineral oil ISO VG 32/46	To understand hydrodynamic lubrication & thrust bearing operation	Visualize oil film formation, pressure distribution	PO1, PO2, PO3, PO4, PO6, PO7, PO12, PSO1, PSQ2
15	Pin-on-Disc Friction and Wear Apparatus (Refrigeration and Air-conditioning Lab)	Pin dia: 6 mm and 8 mm, load: 0–5 kg, sliding velocity: 0.1–10 m/s	To study friction, wear mechanisms & surface interactions	Wear rate and mechanism study under varying conditions	PO1, PO2, PO3, PO4, PO5, PO6, PO12, PSO1, PSQ2
16	Journal Bearing Apparatus (Refrigeration and Air-conditioning Lab)	Journal dia: 50 mm, bearing dia: 55 mm, lubricating oil SAE 20	To provide practical exposure to hydrodynamic lubrication principles	Analyze effect of load, speed and lubricant viscosity	PO1, PO2, PO3, PO4, PO6, PO7, PO12, PSO1, PSQ2
17	Optical Flat (Material Science and Metrology Lab)	Precision optical instrument used with monochromatic light to measure surface flatness using interference fringes.	To provide students hands-on exposure to high-precision metrology and quality inspection techniques.	Used in Metrology & Quality Control lab to measure surface flatness and identify surface irregularities of machined components.	PO1, PO2, PO4, PSO1
18	Surface Roughness Tester (Material Science and Metrology Lab)	Electronic instrument used to measure surface roughness parameters such as Ra, Rz, and Rt.	To enable students to evaluate surface finish and understand its impact on functional performance of components.	Utilized in experiments related to surface finish analysis after machining processes like turning, milling, and grinding.	PO1, PO2, PO5, PSO1
19	Auto Collimator with Angle Dekkor (Material Science and Metrology Lab)	Optical instrument used for precise measurement of small angular deviations, straightness, and alignment errors.	To train students in advanced alignment and angular measurement techniques required in precision engineering.	Used in alignment, straightness, and angular error measurement experiments in Metrology lab.	PO1, PO4, PO5, PSO2

20	Comparator (Mechanical) (Material Science and Metrology Lab)	Mechanical device used for comparing dimensions of components with standard references using magnification.	To develop understanding of comparative measurement methods and dimensional inspection.	Employed for checking linear dimensions, tolerance verification, and comparative measurements in quality control experiments.	PO1, PO2, PO4, PSO1
21	Sectional Models (Thermal Lab)	Models of Boilers (Babcock and Wilcox, Sterling, Lamont, Velox, Loeffler, Benson, Lancashire), safety valve, fuel system, carburetors	To provide visual & conceptual understanding of boiler construction and working principles	Study constructional features and working principles	PO1, PO2, PO3, PO6, PSO1
22	Self-explanatory Charts	Charts	Better understanding of concepts	All students	PO12, PSO1
23	Departmental Library	Technical Books, Datasheets, Project reports of students	Provide students access to books and project reports of previous academic years.	Learning and understanding the concept of projects	PO12, PSO1
24	Virtual Lab	The Virtual Labs project provides remote-access to simulation-based Labs in Mechanical Engineering	To enthuse students to conduct experiments by arousing their curiosity. To provide a complete Learning Management System around the Virtual Labs where the students can avail the various tools for learning including additional web-resources, video-lectures, animated demonstrations and self-evaluation.	To help students in learning basic and advanced concepts through remote experimentation.	PO1, PO2, PO3, PO4, PO5, PO6, PO9, PO11, PO12, PSO1, PSO2
25	Campus Credentials	Provides in demand corporate skills, aptitude and technical Training	The purpose of Campus Credentials is to equip students with the skills and knowledge required to excel in campus placements and competitive examinations, making them industry-ready.	Aptitude Training Soft Skills Training / Soft Skills Development Technical Skills Training Mock Interviews (Technical & HR) Group Discussion (GD) Training Company-Specific Training / Corporate-Specific Training Aptitude Test Series Technical Test Series Proctored Online Tests / Proctored Assessment Environment Individual Student Login / Personalized Login Access Practice Test Series / Mock Test Series LMS (Learning Management System) Access	PO1, PO2, PO3, PO8, PO10, PO11, PO12
26	Turnitin / Copy leaks Plagiarism Software	Turnitin / Copy leaks Plagiarism Software solutions promote academic integrity, streamline grading and feedback, deter plagiarism, and improve student outcomes.	To provide students with a tool to identify and correct possible occurrences of plagiarism in their own work and improve their academic writing	To help students to identify occurrences of plagiarism.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12, PSO2
27	Smart Board	Smart board IWB(Interactive white Board)	To make the teaching and learning process more effective.	To support ICT- based teaching-learning process	PO1, PO2, PO5, PO10 PSO1, PSO2

28	LCD Projectors	Good Quality LCD Projectors are available	Projectors available to make teaching & learning effective.	To support ICT-based teaching-learning process in Laboratories	PO1, PO2, PO5, PO10 PSO1, PSO2
29	NPTEL Online Learning Facility	NPTEL (National Programme on Technology Enhanced Learning) is an online learning platform offering video lectures, assignments, and certification courses in mathematics and allied disciplines, developed by IITs and IISc. The facility provides access to high-quality academic content, quizzes, and proctored examinations.	The facility was created to enhance conceptual understanding of mathematics through expert-led instruction and to support outcome-based education. It promotes self-paced learning, bridges curriculum gaps, and exposes students to advanced and applied mathematical topics beyond the syllabus.	Students utilize the facility to enroll in mathematics-related NPTEL courses, complete weekly assignments, participate in discussions, and obtain certifications. The platform is used for blended learning, credit transfer (where applicable), exam preparation, and faculty-guided enrichment activities.	PO1, PO2, PO3, PO5, PSO1, PSO2
30	Learning Management System - Moodle	It is a fully Customizable Learning Management System.	Moodle has forums, messaging, chat, comments, and blog posts available for students and teachers to communicate beyond the classroom	To provide educators, administrators and learners with a single robust, secure and integrated system to create personalized learning environments.	PO1, PO3, PO4, PO5, PO8, PO9, PO10, PSO2

7.3 Maintenance of laboratories and overall ambiance (10)

Total Marks 10.00

Maintenance Policy

The Mechanical Engineering Department follows a clear and systematic maintenance policy to keep all laboratory setup in good working condition. The main aim of the policy is to ensure safe usage of equipment, avoid sudden breakdowns, and provide smooth conduct of practical sessions.

Regular checking, cleaning, and testing of setup are carried out throughout the academic year. Calibration and performance verification are done whenever required. Each laboratory maintains a maintenance log book to record inspection details, faults, repairs, and corrective actions. The technical staff are responsible for monitoring the condition of equipment and reporting any issues immediately. This policy helps in maintaining safety, reliability, and uninterrupted laboratory activities.

Preventive & Corrective Maintenance

The Department follows both preventive and corrective maintenance practices to ensure proper functioning of laboratories.

Preventive Maintenance:

Preventive maintenance is carried out regularly to avoid setup failure. It includes visual inspection, cleaning of setup and surroundings, checking electrical connections, verifying safety measures, testing equipment performance, and carrying out minor repairs if required. All maintenance details are recorded in the logbook before approving the setup for regular use. The preventive maintenance procedure is shown in Figure 7.3.1.

Corrective Maintenance:

Corrective maintenance is done when a fault or problem is identified in any laboratory setup. The fault is first recorded in the maintenance register. Initial inspection and basic troubleshooting are performed. If the problem cannot be solved in the laboratory, a maintenance request is prepared and approval is taken from higher authorities. Repair or replacement is carried out through authorized vendors if required. After repair, the equipment is tested, records are updated, and verification is done before restarting laboratory work. The corrective maintenance process is shown in Figure 7.3.2.

Overall Ambiance

The Mechanical Engineering Department ensures a clean, safe, and student-friendly laboratory environment. All laboratories are well-ventilated, properly illuminated, and arranged in an organized manner to provide a comfortable learning atmosphere. Adequate seating arrangements and sufficient working space are provided to students during practical sessions.

Safety instructions, Dos and Don'ts, and Standard Operating Procedures (SOPs) are clearly displayed in each laboratory. Fire safety equipment, first-aid boxes, and electrical safety measures are available to ensure a secure environment. Proper housekeeping practices are followed to maintain cleanliness and discipline in the laboratories.

The laboratories are equipped with required furniture, power supply arrangements, internet connectivity and proper storage facilities for instruments and components.

The overall ambience supports effective teaching-learning, practical experimentation, and safe laboratory operations.

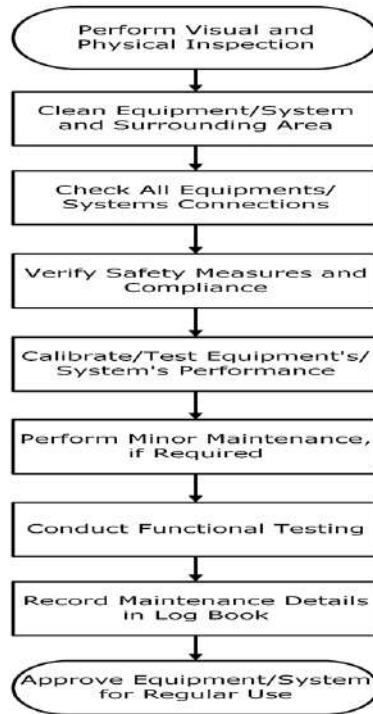


Figure 7.3.1 Preventive Maintenance Flowchart

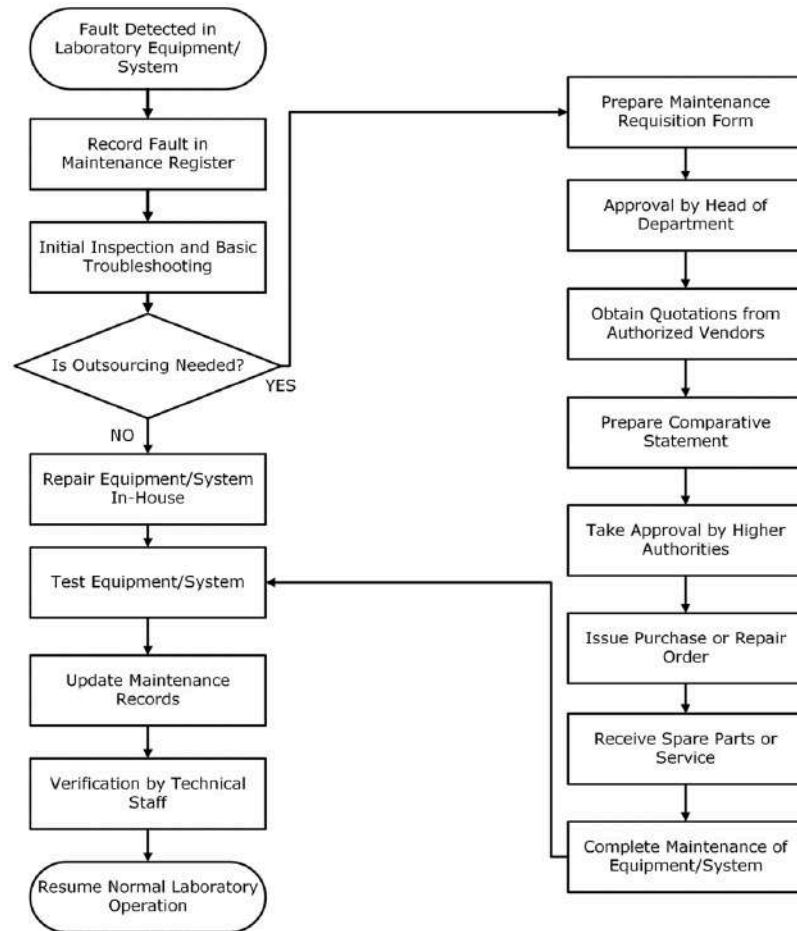


Figure 7.3.2 Corrective Maintenance Flowchart

Sr. No	Laboratory Name	Safety Measures
1	ME L-1 Material Science and Metrology Lab	A. Basic safety measures: Dos and Don'ts, SOP. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety, Safety goggles. Cotton hand gloves and tongs are used for handling heated specimen during practical related to surface.
2	ME L-2 Refrigeration and Air Conditioning Lab	A. Basic safety measures: Dos and Don'ts, SOP. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety.
3	ME L-3 Heat Transfer and Dynamics of Machinery Lab	A. Basic safety measures: Dos and Don'ts, SOP. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety.
4	ME L-4 Fluid Machinery Lab	A. Basic safety measures: Dos and Don'ts, SOP. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety.
5	ME L-5 Thermal Engineering Lab	A. Basic safety measures: Dos and Don'ts, SOP. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety.
6	ME L-6 Mechatronics Lab	A. Basic safety measures: Dos and Don'ts, SOP. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety.
7	ME L-7 Workshop	A. Basic safety measures: Dos and Don'ts, SOP, Specification. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety, Apron, Shoes, Hand gloves, Safety goggles, Tongs, Line tester, Safety belt and helmets, Test lamp, Fire safety buckets and Fire Hydrant System, Exhaust fans etc.
8	CAD Lab	A. Basic safety measures: Dos and Don'ts, SOP. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety.
9	Project Lab	A. Basic safety measures: Dos and Don'ts, SOP. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety.
10	Centre of Excellence	A. Basic safety measures: Dos and Don'ts, SOP. B. Lab-specific safety measures: First-aid box, CCTV Surveillance, Fire safety and Electrical Safety.

To promote project-based learning, research activities, and innovation, the Mechanical Engineering Department has developed dedicated facilities such as the Project Laboratory, and Centre of Excellence. These facilities provide students with the required environment for design, experimentation, simulation, testing, and advanced technical work. They help in enhancing analytical skills, technical knowledge, and industry readiness of students. The details of these facilities are presented in table shown below.

Table No. 7.5.1: List of Project Laboratory/Centre of Excellence

S.N .	Name of the Laboratory
1.	<p>Project Lab:</p> <p>The department has well-established Project Laboratory that is readily accessible to students for executing Semester Projects, Capstone Projects, research work, and innovative activities. This laboratory is equipped with adequate computing infrastructure, experimental facilities, and reliable internet connectivity to facilitate effective project implementation and research-based learning. The available computer systems are configured with 16 GB RAM and Intel i3-4130T processors, enabling smooth execution of design, modeling, and simulation tasks.</p> <p>Details of completed projects are documented in Section 2.2(D) of the Self-Assessment Report (SAR).</p> <p>To support industry-oriented and research-driven learning, the department provides access to licensed software such as Autodesk Inventor (Fusion 360 and AutoCAD – Educational Access with 3000 nodes) and ANSYS 2022 R1 (with 25 nodes).</p> <p>Utilization</p> <p>The Project Laboratory is systematically utilized throughout the academic year for execution of student projects. The department strengthens hands-on learning by providing fabrication/manufacturing facilities in workshop that enable students to undertake fabrication, prototyping, and experimental validation of their designs. Faculty members regularly monitor progress, conduct review meetings, and guide students during validation and performance assessment stages.</p> <p>Relevance to POs/PSOs: PO1, PO2, PO3, PO7, PO8, PO9, PO11, PSO1, PSO2</p>

2. **Center of Excellence**

The Institute has established a Centre of Excellence as a dedicated facility to promote advanced learning, innovation, and industry interaction. It acts as a common platform where students and faculty members can engage in project development, research activities, skill enhancement programs, and technology-based initiatives.

The Centre is supported with modern infrastructure, updated hardware platforms, and required software tools to work in emerging and interdisciplinary domains.

The **Center of Excellence for EV The Electric Vehicle (EV) Laboratory** serves as a Center of Excellence in the Department of Mechanical Engineering, fostering innovation and skill development in emerging sustainable mobility technologies. The lab provides foundational exposure to EV components, battery systems, motor drives, and energy management concepts through hands-on learning.

The **Center of Excellence for foreign Languages** is to improve students' communication and professional skills. The Language Lab is equipped with audio-visual systems and language learning software to enhance listening, speaking, reading, and writing skills. In addition to English communication training, the lab also provides training in German and Japanese languages to improve global employability and international opportunities for students.

The **Center of Excellence integrates the CodeChef Learning Platform** to systematically enhance students' programming, problem-solving, and analytical capabilities. It provides a structured and progressive learning environment focused on building strong foundations in coding, logical reasoning, and algorithm design. The curriculum is aligned with industry standards to strengthen computational thinking and core technical competencies required in today's technology-driven landscape.

Beyond problem-solving, the platform emphasizes hands-on project development using modern technologies such as MERN (MongoDB, Express.js, React, and Node.js), SQL, Spring Boot, Data Analysis, and Machine Learning. Students gain practical exposure by building real-world applications, working with databases, and developing intelligent systems, thereby bridging the gap between theoretical learning and industry application.

Utilization

The Centre of Excellence is actively utilized for student projects, faculty research, workshops, certification programs, internships, and technical training activities. It provides opportunities for students to work on real-time problems, develop prototypes, and enhance practical skills.

Industry experts and alumni are invited for expert talks, mentoring sessions, and technical guidance. The Centre also supports innovation activities, product development initiatives, and entrepreneurship-related efforts. Through these activities, students gain hands-on exposure to modern technologies and professional practices.

The CodeChef platform is utilized to enhance students' coding proficiency and analytical thinking through structured practice in a time-bound environment, improving both accuracy and execution speed. It supports systematic preparation for technical interviews and placement processes by reinforcing core programming concepts and data structures.

Additionally, students engage in technology-driven project work across domains such as full-stack development (MERN stack), database management (SQL), and Machine Learning, enabling them to build portfolios that demonstrate practical skills alongside problem-solving expertise.

The Centre of Excellence provides hands-on training to students in EV powertrain assembly, drivetrain integration, shaft alignment, and mounting system design. Students conduct performance testing of BLDC motor drives, including torque-speed characteristics, with battery pack testing and BMS

evaluation. The facility also supports EV diagnostics, wiring harness routing with emphasis on safety, and load considerations. It effectively integrates concepts of machine design, heat transfer, materials, and manufacturing with practical electric vehicle applications.

The Language Lab is utilized for communication skill development, presentation practice, group discussions, interview preparation, and foreign language learning (German and Japanese). It helps students build confidence and prepare for placements and global career opportunities.

Relevance to POS/PSOs: PO1, PO2, PO3, PO4, PO5, PO10, PO11, PSO1, PSO2

8 CONTINUOUS IMPROVEMENT (80)

Total Marks 80.00

8.1 Actions taken based on the results of evaluation of each of the COs, POs & PSOs (40)

Total Marks 40.00

The following are the areas of weaknesses in the program based on the analysis of evaluation of COs attainment levels along with the action taken

Table No. 8.1.1.1: Analysis of Evaluation of COs Attainment Levels along with the Action Taken

Area of Weakness	Observed Cause(s)	Corrective Action(s)	Responsible Unit
Fundamental Knowledge	<ul style="list-style-type: none"> Weak foundation in applied sciences Limited practice with numerical problem-solving 	<ul style="list-style-type: none"> Introduced bridge courses Conducted remedial classes Given Assignments and Question Banks 	Course Instructors
Design & Problem-Solving Skills	<ul style="list-style-type: none"> Lack of exposure to open-ended design challenges 	<ul style="list-style-type: none"> Integrated case studies & real-life projects Organized design competitions 	Department & Faculty
Communication & Teamwork	<ul style="list-style-type: none"> Weak technical writing & presentation skills Limited group project exposure 	<ul style="list-style-type: none"> Conducted workshops on communication Introduced group assignments & peer evaluation 	Faculty & Language Lab
Industry Readiness	<ul style="list-style-type: none"> Insufficient internships & industrial visits Lack of awareness of standards & sustainability 	<ul style="list-style-type: none"> Strengthened internship programs Invited industry experts for guest lectures Added ethics and sustainability modules. 	Training & Placement Cell
Higher-Order Thinking & Innovation	<ul style="list-style-type: none"> Limited exposure to research Lack of project-based learning 	<ul style="list-style-type: none"> Encouraged participation in hackathons Introduced research-oriented final year projects Promote innovation clubs 	Faculty & Research Cell

The table shows the comparison of target levels and CO attainment for all semesters.

Table No. 8.1.1.2: Target Level and CO Attainment for 2021-2025

First Semester														
Subjects	C101T	C102T	C103T	C104T	C105T	C106L	C107L	C108L	C109L					Avg
Target Level	1.20	1.20	1.20	1.20	1.20	2.10	2.10	2.10	2.10					1.60
Co Attainment	1.32	1.53	1.67	1.52	1.82	2.25	2.15	2.05	2.16					1.83
Actions: CO Attainment > Target Level														
Second Semester														
Subjects	C110T	C111T	C112T	C113T	C114 T	C115T	C116L	C117L	C118L	C119L	C120L			Avg
Target Level	1.20	1.20	1.20	1.20	1.20	1.20	2.10	2.10	2.10	2.10	2.10			1.61
Co Attainment	1.45	1.39	1.37	1.39	1.44	1.33	2.09	2.19	1.69	2.52	1.06			1.63

First Semester														
Actions: CO Attainment > Target Level														
Third Semester														
Subjects	C201T	C202T	C203T	C204L	C205T	C206T	C207L	C208L	C209L	C210L				Avg
Target Level	1.35	1.35	1.35	2.10	1.35	1.35	2.10	2.10	2.10	2.10				1.73
Co Attainment	1.68	1.83	1.69	2.04	1.82	1.83	1.78	2.73	2.49	2.98				2.09
Actions: CO Attainment > Target Level														
Fourth Semester														
Subjects	C211T	C212T	C213L	C214T	C215L	C216T	C217T	C218L	C219L	C220T	C221L	C222L		Avg
Target Level	1.35	1.35	2.10	1.35	2.10	1.35	1.35	2.10	2.10	1.35	2.10	2.10		1.73
Co Attainment	1.65	1.55	2.32	2.16	2.54	2.27	1.62	1.98	2.82	1.48	2.58	0.88		1.99
Actions: CO Attainment > Target Level														
Fifth Semester														
Subjects	C301T	C302L	C303T	C304L	C305T	C306L	C307T	C308L	C309T	C310L	C311T	C312L	C313L	Avg
Target Level	1.50	2.10	1.50	2.10	1.50	2.10	1.50	2.10	1.50	2.10	1.50	2.10	2.10	1.82
Co Attainment	1.83	2.04	1.72	2.82	1.69	2.46	2.52	2.32	2.17	2.97	2.97	2.97	0.89	2.26
Actions: CO Attainment > Target Level														
Sixth Semester														
Subjects	C314T	C315L	C316T	C317L	C318T	C319L	C320T	C321L	C322T	C323L	C324L			Avg
Target Level	1.50	2.10	1.50	2.10	1.50	2.10	1.50	2.10	1.50	2.10	2.10			1.83
Co Attainment	1.39	2.54	1.64	2.15	1.70	2.46	1.74	2.11	1.80	2.65	2.97			2.10
Actions: CO Attainment > Target Level														
Seventh Semester														
Subjects	C401T	C402L	C403T	C404L	C405T	C406T	C407L							Avg
Target Level	1.50	2.10	1.50	2.10	1.50	1.50	2.10							1.76
Co Attainment	1.89	2.98	1.87	2.97	1.77	2.55	2.98							2.43
Actions: CO Attainment > Target Level														
Eight Semester														
Subjects	C408T	C409T	C410L											Avg
Target Level	1.50	1.50	2.10											1.70
Co Attainment	2.48	2.57	2.97											2.67
Actions: CO Attainment > Target Level														

2021-25 Batch

Rubric for setting the Targets of PO attainment based on the average mapping of program PO-PSOs with the courses as

Program Outcome	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	Average of PO
Average of PO Mapping	2.41	1.74	1.34	1.35	1.38	2.25	1.81	1.93	1.6	1.38	1.11	1.42	1.6

- For the POs mapping with more than 70% of courses the target is 1.7
- For the POs mapping with 50% to 70% courses the target is 1.6
- For the POs mapping with less than 50% courses the target is 1.5

Rubric for setting the Targets of PSOs attainment based on the average mapping of program PSOs with the courses as

Program Specific Outcome	PSO-1	PSO-2	Average of PSO
Average of PSO Mapping	1.27	1.32	1.3

- For the PSOs mapping with more than 70% of courses the target is 1.4
- For the PSOs mapping with 50% to 70% courses the target is 1.3
- For the PSOs mapping with less than 50% courses the target is 1.2

Table No. 8.1.2.1: Results of Evaluation of the POs Attainment

POs	Target Level	Attainment Level	Observations
PO1: Engineering Knowledge			
PO1	1.7	1.81	Target Achieved
Action 1: Extra classes conducted related to basic engineering.			
Action 2: Remedial classes were conducted for slow learners.			
Action 3: Use virtual lab experiments and quiz to improve conceptual clarity.			
Action 4: Practice assignments on fundamental engineering topics was provided.			
PO2: Problem Analysis			
PO2	1.7	1.43	Target Not Achieved
Action 1: Analytical based teaching adopted.			
Action 2: Encourage students to participate in Moodle quizzes and problem-solving activities.			
Action 3: Additional hours were spent on analyzing the challenges and preparing some valid solutions			
PO3: Design/Development of Solutions			
PO3	1.7	1.18	Target Not Achieved
Action 1: Guest lectures were arranged to better understand the complex engineering problems.			
Action 2: Value Added courses conducted for understanding design aspects of solutions to complex problems			
Action 3: Additional experiments beyond curriculum were conducted			
Action 4: Students were provided the access to NPTEL Videos			
PO4: Conduct Investigations of Complex Problems			

PO4	1.7	1.14	Target Not Achieved
Action 1: Technical events were conducted for students to present projects			
Action 2: Workshops were conducted for hands-on training on latest technologies.			
PO5: Modern Tool Usage			
PO5	1.7	1.20	Target Not Achieved
Action 1: Individual systems were provided for students.			
Action 2: Various Open-source Tools awareness and hand on sessions were conducted.			
Action 3: Updated lab manuals to include tool-based experiments.			
Action 4: Included sessions to check simulation results and compare them with manual calculations.			
PO6: The Engineer and Society			
PO6	1.5	1.71	Target Achieved
Action 1: Conduct safety drills and workshops in labs.			
Action 2: Organize seminars on intellectual property rights.			
Action 3: Incorporated projects addressing local community needs (energy, water, waste management)			
Action 4: Encouraged participation in social outreach programs			
Action 5: Organized debates, poster competitions, and awareness campaigns on engineering & society			
PO7: Environment and Sustainability			
PO7	1.6	1.41	Target not Achieved
Action 1: Engaged students in projects on waste segregation, renewable energy adoption, water conservation, and carbon footprint reduction.			
Action 2: Organized industrial visits, guest lectures, and internships focusing on green manufacturing, renewable energy, and circular economy practices.			
Action 3: Encourage final-year projects, hackathons, and innovation labs targeting renewable energy, recycling, and sustainable materials.			
Action 4: Hosted seminars, poster competitions, and awareness drives on climate change, pollution control, and Sustainable Development Goals (SDGs).			
Action 5: Used energy-efficient equipment, minimize resource wastage, and design experiments with sustainability focus.			
PO8: Ethics			
PO8	1.6	1.63	Target Achieved
Action 1: A Seminar on Entrepreneurship Development			
Action 2: Integrate engineering ethics case studies into core courses.			
Action 3: Conduct seminars/workshops on professional ethics and integrity.			
Action 4: Include ethics-based questions in exams and assignments.			
Action 5: Encourage students to sign a "Code of Conduct" pledge before labs/projects.			
Action 6: Organize debates/poster competitions on ethical dilemmas in engineering.			
PO9: Individual and Team Work			
PO9	1.6	1.33	Target not Achieved

Action 1: A Seminar on Entrepreneurship Development			
Action 2: Introduce group projects with peer evaluation components.			
Action 3: Conduct team-building workshops and leadership training.			
Action 4: Assign multidisciplinary projects involving collaboration across departments.			
Action 5: Encourage participation in student clubs and professional societies.			
Action 6: Recognize and reward effective teamwork in project evaluations.			
PO10: Communication			
PO10	1.7	1.16	Target not Achieved
Action 1: Conduct technical presentation and communication workshops.			
Action 2: Include report writing and documentation in project evaluation.			
Action 3: Encourage students to present seminars on technical topics.			
Action 4: Organize group discussions and mock interviews.			
Action 5: Promote participation in technical paper presentations.			
Action 6: Train students in preparing technical posters and presentations.			
Action 7: Encourage publication of student articles in technical magazines.			
Action 8: Conduct communication skill development programs.			
PO11: Project Management and Finance			
PO11	1.5	0.98	Target not Achieved
Action 1: Introduce project planning and scheduling exercises.			
Action 2: Provide training on cost estimation and budgeting.			
Action 3: Encourage students to organize departmental events with financial planning.			
Action 4: Include case studies on project management.			
Action 5: Provide exposure to industry project management practices.			
Action 6: Encourage participation in project exhibitions and competitions.			
Action 7: Integrate project management concepts in project work.			
Action 8: Embed basic finance and cost analysis modules in curriculum.			
Action 9: Collaborate with industry for real-world project management case studies.			
PO12: Life-long Learning			
PO12	1.7	1.13	Target Not Achieved
Action 1: Encourage students to enroll in MOOCs and online certification courses.			
Action 2: Promote participation in seminars, workshops, and conferences.			
Action 3: Provide assignments encouraging self-learning.			
Action 4: Motivate students to participate in internships and industrial training.			
Action 5: Encourage use of digital learning resources and journals.			
Action 6: Organize technical contests and innovation activities.			
Action 7: Encourage students to pursue skill development programs.			
Action 8: Establish access to online learning platforms.			
Action 9: Recognize students achieving additional certifications.			

Table No. 8.1.2.2 Results of Evaluation of the PSOs Attainment

PSOs	Target Level	Attainment Level	Observations
PSO1: Students should be able to apply technical skills and modern engineering tools to analyze, design and develop the mechanical systems.			
PSO1	1.4	1.07	Target Not Achieved
<p>Action 1: Provide training on advanced engineering tools such as CAD and simulation software.</p> <p>Action 2: Encourage design-based projects in mechanical engineering subjects.</p> <p>Action 3: Organize session on modern engineering tools and technologies.</p> <p>Action 4: Facilitate internships and industrial visits for practical exposure.</p>			
PSO2: To create innovative, entrepreneurial and disciplined future Mechanical Engineering graduates, fit for the globally competent environment.			
PSO2	1.4	1.11	Target Not Achieved
<p>Action 1: Encourage students to participate in innovation contests, startup incubation programs, and hackathons.</p> <p>Action 2: Strengthened Industry Linkages by facilitating collaborations, and industry related projects to align students with societal needs.</p> <p>Action 3: Organize seminars on industry readiness and professional skills.</p> <p>Action 4: Encourage students to develop startup ideas and innovative projects.</p>			

The Institute has established a formal, structured, and documented Academic Audit framework to ensure quality systems implementation, continuous improvement in academic processes, governance, and outcomes. The academic audit is an integral part of the Institute's quality assurance framework and is implemented through the Internal Quality Assurance Cell (IQAC). Academic audit is viewed as a systematic and scientific peer-review process aimed at evaluating the effectiveness of academic planning, curriculum implementation, teaching-learning practices, assessment and evaluation systems, outcome-based education (OBE) implementation, faculty development, research activities, industry interaction, student support systems, and governance mechanisms. The audit process integrates departmental self-assessment, internal audit by cross-departmental peers, and external academic audit conducted by External academic audit committee includes External members thereby ensuring transparency, objectivity, and continuous improvement. The overall academic audit cycle and feedback mechanism adopted by the Institute are illustrated in the figure 8.2.1 below.

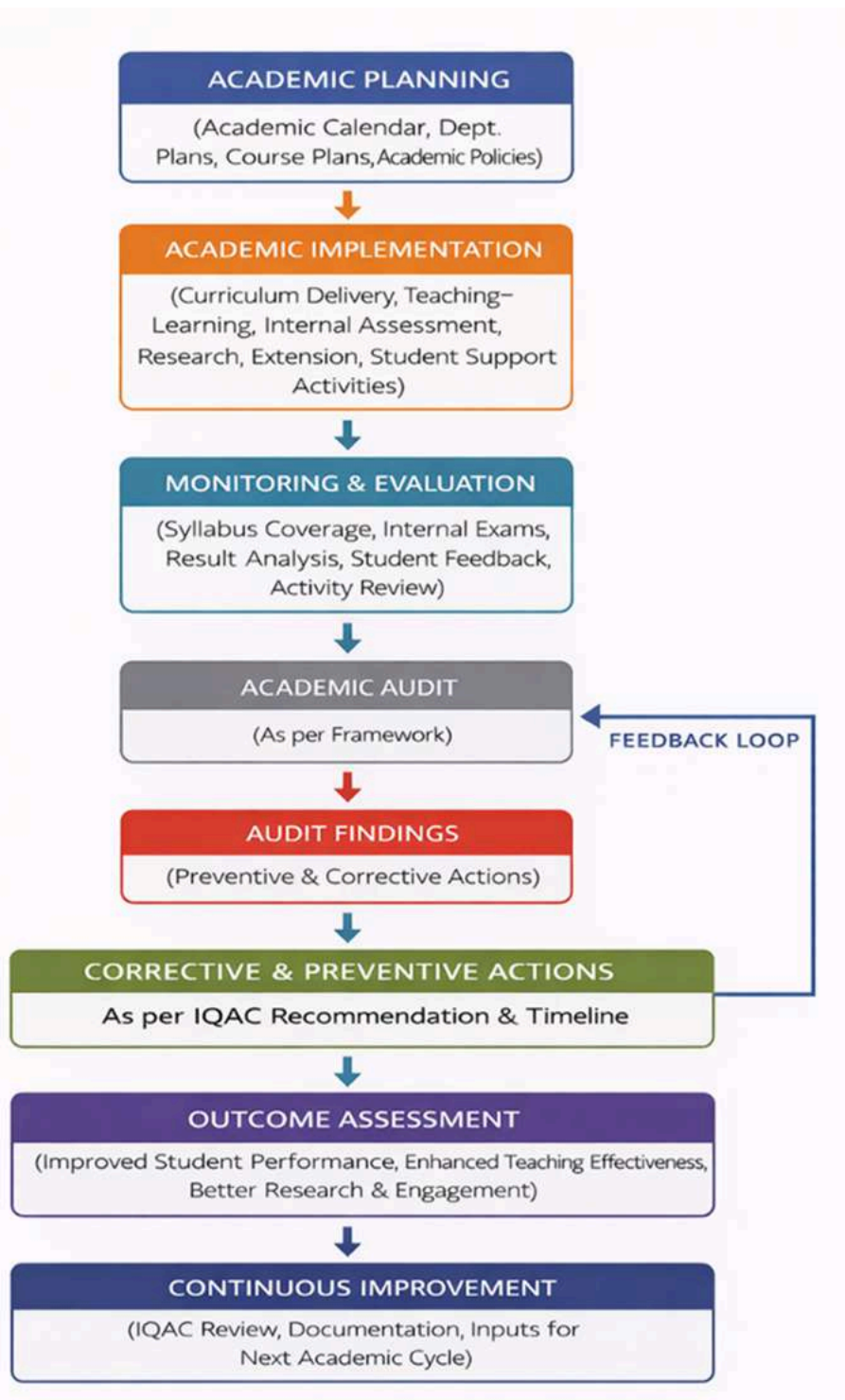


Figure 8.2.1: Academic Audit and Continuous Improvement Framework.

8.2.1 Internal Academic Audit:

1. General Information

- Name of the Institution:
- Department:
- Program(s):
- Date of Audit:
- Audit Team Members:
- Head of Department:

2. Purpose of Internal Academic Audit

The purpose of the Internal Academic Audit is to systematically monitor, evaluate, and enhance academic processes, governance practices, and learning outcomes of the Department. The audit ensures alignment with institutional quality policies and regulatory standards and promotes continuous improvement through evidence-based corrective and preventive actions.

3. Objectives

- To assess compliance with Outcome Based Education (OBE) practices
- To evaluate curriculum implementation and delivery
- To review COs–POs–PSOs mapping and attainment
- To examine teaching–learning and assessment processes
- To identify strengths, gaps, and improvement opportunities
- To recommend corrective and preventive actions

4. Audit Methodology

The audit is conducted through a four-stage structured process and it is carried out twice in year as per format given in table no 8.2.3.

4.1 Pre-Audit Preparation

- Communication of audit framework and scoring rubric
- Departmental self-assessment
- Submission of academic documents such as:
 - Academic calendar
 - Teaching plans and course files
 - Laboratory manuals
 - Assessment records
 - COs–POs–PSOs matrices
 - Student feedback
 - Faculty development records
 - Research outcomes
 - Industry interaction details
 - Departmental events records

4.2 On-Site Verification

- Document verification
- Interaction with faculty and students
- Observation of classrooms and laboratories
- Physical verification of infrastructure and learning resources

4.3 Evaluation

Each parameter is evaluated using a five-point scale as shown in table no 8.2.1.

Table No. 8.2.1: Scale Description.

Scale	Description	Interpretation
5	Excellent	Fully compliant; exemplary practices
4	Very Good	Minor gaps; mostly compliant

3	Good	Moderate gaps; improvement needed
2	Fair	Significant gaps; corrective action required
1	Poor	Non-compliant; urgent intervention required

4.4 Reporting and Action Planning

- Consolidation of audit findings
- Preparation of Internal Academic Audit Report
- Development of time-bound Action Plan
- Monitoring through departmental meetings and IQAC reviews

5. Assessment Framework

The audit evaluates 40 parameters under the following domains:

1. Curriculum Design & Implementation
2. Teaching–Learning Process
3. Assessment & Evaluation
4. COs–POs–PSOs Mapping and Attainment
5. Faculty Development & Research
6. Student Support & Progression
7. Infrastructure & Learning Resources
8. Industry Interaction & Innovation
9. Feedback Systems
10. Governance & Leadership

6. Scoring and Grading

Departmental Grade Based on Total Score (Out of 200) as shown in table no 8.2.2.

Table No. 8.2.2: Score Range.

Score Range	Equivalent Grade
More Than 170	Excellent
150 – 170	Good
120 – 150	Average
100 – 120	Below Average
Less Than 100	Concern

This grading system enables benchmarking of departmental performance and identification of priority areas for improvement.

7. Parameter-wise Evaluation Table

Table No. 8.2.3: Internal Academic Audit Format

Sr. No	Content	Scale	Remark
1	The curriculum is aligned with the regulatory guidelines, and relevant Sustainable Development Goals (SDGs).		
2	The department follows a structured and periodic process for curriculum development and revision.		

Sr. No	Content	Scale	Remark
3	Program Outcomes (POs) and Course Outcomes (COs) are clearly defined, mapped, and regularly assessed.		
4	The curriculum integrates cross cutting issues, interdisciplinary, skill-based, and experiential learning components effectively.		
5	Indian Knowledge Systems, Value Education concepts are embedded within the curriculum.		
6	Stakeholder feedback (students, faculty, industry, alumni, employer) is systematically collected and used in curriculum design.		
7	The curriculum offers flexibility in credit structure, electives, and academic pathways for students.		
8	Curriculum implementation and delivery are consistently monitored across departments and faculty.		
9	Value-Added Courses (VACs), MOOCs, internships, and field projects are integrated and credited within the curriculum.		
10	The online courses through SWAYAM / SWAYAM Plus and other recognized platforms are actively completed by students and are credited in the curriculum		
11	Course files are maintained as per checklist and audited by IQAC after the end of every semester.		
12	Faculty members prepare, approve, and consistently follow lesson plans for all courses.		
13	Innovative teaching methodologies (e.g., ICT tools, experiential learning) are effectively adopted.		
14	The Learning Management System (LMS) is actively used for content delivery, assessment, and student engagement.		
15	Student learning levels are regularly assessed, with appropriate support provided to slow and advanced learners.		
16	Internal assessments (Question Papers) are conducted as per schedule and are mapped to Course Outcomes (COs) as well as Blooms Taxonomy.		
17	Mechanisms for monitoring teaching quality and collecting student feedback are well-established and functional.		

Sr. No	Content	Scale	Remark
18	Faculty members are trained in outcome-based education and pedagogical practices.		
19	Student attendance is systematically tracked and used to guide academic support interventions.		
20	Remedial and bridge programs are conducted regularly to support diverse learner needs.		
21	CO-PO attainment is analyzed and used to improve teaching practices and curriculum delivery.		
22	Local Guardian System is effectively practiced.		
23	Faculty and students publish high-quality research in peer-reviewed journals and conferences.		
24	The department actively undertakes funded research projects, consultancies, and collaborations with external bodies.		
25	Institutional mechanisms effectively promote innovation, patent filing, and intellectual property (Copyright).		
26	Students are actively engaged in research through projects, internships, competitions, and scholarly activities.		
27	The quality of seed money, projects and outcome.		
28	Classrooms, laboratories, and departmental facilities are adequate, accessible, and well-maintained.		
29	The department is equipped with sufficient ICT tools, internet connectivity, and digital teaching resources.		
30	Faculty and students effectively utilize e-resources, open source software, LMS platforms, and digital libraries for academic activities.		
31	Systems for regular maintenance, safety audits, and infrastructure upgrades are well-established and functional.		
32	The department actively promotes green practices, energy efficiency, and eco-friendly infrastructure use.		
33	Student results are consistently analyzed across programs and semesters to monitor academic performance.		

Sr. No	Content	Scale	Remark
34	Student progression to higher studies, employment, and entrepreneurship, Self-employed Social worker is effectively monitored and documented.		
35	A significant percentage of students secure internships, placements, or success in competitive examinations.		
36	Student achievements in co-curricular and extracurricular domains are well-documented and formally recognized.		
37	Student achievements in academics, research, and innovation are showcased through awards, publications, or media.		
38	Alumni achievements are tracked and used to inform departmental strategy and mentoring initiatives.		
39	Roles and responsibilities of faculty and staff are clearly assigned and periodically reviewed.		
40	Departmental meetings are conducted regularly, with decisions properly recorded and implemented.		
Total Score:			

Total Score: _____ / 200

Equivalent Grade: _____

8. Key Findings

8.1 Strengths

- ...
- ...
- ...

8.2 Areas for Improvement

- ...
- ...
- ...

9. Recommendations

- ...
- ...
- ...

10. Conclusion

The Internal Academic Audit concludes that the department demonstrates _____ level of compliance with OBE practices. Continuous improvement initiatives are recommended in identified areas to enhance academic quality and stakeholder satisfaction.

Signatures

Audit Committee Members:

1. _____

2. _____

Head of Department: _____

IQAC Coordinator: _____

8.2.2 External Academic Audit:

The External Academic Audit is conducted annually as per DBATU guidelines. The audit verifies the effective conduct of theory courses, laboratory courses, project work, internships, and activity-based learning components, as shown in table no 8.2.4. Audit reports are prepared in the prescribed Academic Advisors Report (AAR) format, and documented reports are available for the academic years 2022–23, 2023–24, and 2024–25, confirming the robustness of the external academic audit mechanism.

I. Curricular Aspects:

The Institute implements the curriculum through well-defined Annual Institutional Academic Plans and Departmental Curricular Plans. Academic calendars are prepared in advance and strictly followed. Syllabus coverage is regularly monitored, and 90–100% syllabus completion is achieved for all courses. Curriculum enrichment is ensured through add-on courses, MOOCs (NPTEL/Coursera), foundation courses such as Universal Human Values and Environmental Studies, and skill-oriented programs. Structured online student feedback on curriculum is collected and analyzed for continuous improvement.

II. Teaching, Learning and Evaluation:

Teaching-learning processes are systematically planned through teaching plans, academic diaries, and lesson schedules. ICT-enabled teaching tools such as smart boards and e-learning resources are extensively used. Internal examinations are conducted as per norms with proper documentation. Subject-wise and teacher-wise result analysis is carried out after every examination. Based on performance analysis, remedial classes and mentoring support are provided. Student feedback on teaching effectiveness is obtained through an online mechanism and used for improvement.

III. Research and Consultancy:

The Institute has recognized research centers and qualified research guides. Faculty members contribute through research publications, conference presentations, book publications, FDPs, workshops, and STTPs. While research output is satisfactory, the academic audit identified the need to strengthen funded research projects and consultancy activities. The Institute has documented these observations and initiated measures to encourage proposal submissions and industry collaboration.

IV. Extension Activities:

The Institute actively promotes extension activities through NSS, professional clubs, eco-club, women empowerment initiatives, and the Institute Innovation Cell (IIC). Students participate in social outreach programs, innovation challenges, technical competitions, and entrepreneurship-related activities. These initiatives support experiential learning, social responsibility, and skill development. Suggestions provided by the audit committee are recorded for future implementation.

V. Learning Resources:

The central library is well equipped and fully automated, providing access to print resources, e-resources (N-LIST, DELNET, National Digital Library), e-journals, NPTEL courses, spoken tutorials, and previous years' question papers. Library usage records, circulation data, and visitor registers are systematically maintained, supporting effective teaching-learning processes.

VI. Student Support Activities:

The Institute has a structured student support system including sports, cultural activities, career guidance, placement support, alumni association, grievance redressal, and anti-ragging mechanisms. A Local Guardian (Tutor) Scheme provides mentoring and counseling support. Training and Placement activities focus on skill development and employability, with proper documentation of student participation and placement outcomes.

VII. Basic Amenities:

The Institute provides adequate basic amenities such as safe drinking water, sanitation facilities, women's rest rooms, healthcare support, a hygienic canteen, and a clean, green campus environment. Maintenance records are available, ensuring a safe and supportive learning environment.

VIII. Governance and Leadership:

The Institute follows transparent and participative governance practices through regular staff meetings and functioning academic and administrative committees. Faculty development is encouraged through FDPs, workshops, and access to MOOCs. IQAC coordinates academic planning, monitoring, and documentation, supporting continuous quality improvement.

IX. IT Initiatives:

The Institute has established strong IT infrastructure, including smart classrooms, high-speed internet connectivity, and well-equipped computer laboratories. IT facilities are effectively utilized for academic delivery, assessment, and administration. Digital initiatives support efficient academic management and quality assurance.

X. Best Practices:

The Institute has institutionalized Project-Based Learning (PBL), the Local Guardian mentoring system, and structured teacher assessment practices as best practices. These initiatives enhance student engagement, experiential learning, and academic accountability. IQAC records, annual reports, and AQAR documentation are maintained to support continuous improvement.

Table No. 8.2.4: External Academic Audit Format.

Academic Year (2024-25)				
Academic Advisors Report (AAR)				
I-COLLEGE PROFILE				
1	Name of the College, Website, email and Ph. No.			
2	Name of the Principal, email & Mob. No			
3	Name of the Vice-Principal, email & Mob. No.			
4	Name of the IQAC Coordinator, email & Mob. No.			
5	Year of Establishment & own land if any			
6	NBA accreditation			
7	NAAC Grade with Cycle, Accredited Year & CGPA (if not Accredited Status of Preparations)			
8	UGC Recognition (2F & 12 B)			
9	College Working Hours (if shift system mention details of both shifts & give reasons for shift system)			
10	No. of Posts Sanctioned			
11	Course wise & Year wise Students strength particulars (Proforma enclosed & to be submitted along with AAR)			
II-CURRICULAR ASPECTS				
	Item	Impression of Academic Advisor with grade A(Good)/B(Satisfactory)/C (poor) after observation		Recommendation/Suggestions by Academic Advisors
		Grade	Actual Status	
1	Implementation of Annual Institutional Plan			
2	Departmental Annual Curricular Plans			
3	College Activity Register for the Academic Year			
4	Departmental Activity Registers (Department-wise)			
5	Add-on Courses (Department-wise) completed during Academic Year			
6	Add-on Courses (Department-wise) in Academic Year			
7	Coverage of Syllabus (Average Percentage)			
8	Teaching of Humanities & Foundation Courses			
9	Teaching of Environmental Science and Ethics			
10	No. of New UG & PG Courses introduced this year			
11	Maintenance of Student Attendance Registers			
12	Feedback forms on Curriculum from students			
III-TEACHING, LEARNING & EVALUATION				
1	Teaching Diaries & Plans in the Prescribed Formats			
2	Co-Curricular Activities (College Level)			
3	Academic Competitions (College & Above level)			
4	Conduct of Internal Examinations			
5	Subject wise result analysis			
6	Teacher wise result analysis			
7	Remedial Classes			
8	Record of Evaluation of Teachers by Students			
IV-RESEARCH AND CONSULTANCY				
1	Is the College a Recognized Research Centre			
2	No. of Research Guides in the College			
3	No. of Research Scholars working for Masters & Ph. D			
4	Major/Minor/Other Research Projects			
5	Research Papers Published in Academic year (International /National)			
6	Papers Presented in Academic year (International /National/ State)			
7	Books Published in Academic year (Single Author/ Co Author)			
8	Seminars/Workshops/ Training Programme Conducted in Academic year (International /National/ State)			

9	Record of Consultancy in Academic year			
10	Record of MOUs in Academic year			
V-EXTENSION ACTIVITIES				
1	Record of Subject/Department Related Extension Activities			
2	Name of the NSS PO & Mobile No.			
3	NSS Attendance register			
4	NSS Activity register			
5	Name of the NCC ANO & Mobile No.			
6	NCC Attendance register			
7	NCC activity register			
8	Name of the Professional Club Coordinator & Mobile No.			
9	Professional Club Activities			
10	Name of the Women Empowerment Cell Coordinator & Mobile No.			
11	WEC Activities			
12	Name of the Eco-Club Coordinator & Mobile No.			
13	Eco- Club Activities			
14	Name of the Consumer Club Coordinator & Mobile No.			
15	Consumer Club Activities			
16	Innovation Activity club			
17	Technology Development and Transfer Cell Activities			
18	Any other Club			
VI-LEARNING RESOURCES				
1	Name of the Librarian & Mob. No			
2	Access timings of the Library			
3	Circulation of Books among Students			
4	Availability of Previous years Question papers			
5	Availability of model answers of previous examinations			
6	Record of Visitors to Library			
7	Status of Library Automation			
8	e- Resources & e-Journals			
9	Number of E-Journals			
10	Number of Print Journals			
11	Access to NPTEL courses			
12	Access to Spoken Tutorials			
13	Access to e-learning tutorials			
14	TED-X activity on campus			
VII-STUDENT SUPPORT ACTIVITIES				
1	Name of Dean/Faculty In charge & Mob. No			
2	Activities and Support for Sports			
3	Records of events conducted and significant achievements in Sports & Games			
4	Record of cultural programmes conducted			
5	Record of any other extra-curricular activities conducted			
6	Record of Students trained in different verticals			
7	Record of Student placed in In campus placement			
8	Name of Career Guidance Coordinator and Mob. No			
9	Record of activities Career Guidance and placement cell			
10	Name of Departmental Research Coordinator & Mob. No.			
11	Implementation of Departmental Research Plan			
12	IQAC activities & maintenance of records, (Action Plan/Minutes of Meeting/ submission of AQAR to NAAC etc.)			
13	Record of Alumni Association Activities			
14	Record of Grievance Redressal Cell / Anti Ragging Cell			

15	Awards and Prizes earned by students			
16	Mentoring / Counseling System			
VIII-BASIC AMENITIES				
1	Maintenance of drinking water			
2	Maintenance of Sanitation			
3	Rest room for women students			
4	Greenery & Cleanliness			
5	Health Care Facility			
6	Canteen			
IX-GOVERNANCE AND LEADERSHIP				
1	Staff meetings Register			
2	Functioning of Committees in Administration (Minutes of Meetings)			
3	Awards/Achievements of faculty			
4	Faculty development initiatives			
X - IT INITIATIVES				
1	e-class rooms (Number & Usage)			
2	Internet Centre			
3	Computer labs (No. of labs & working systems)			
XI-BEST PRACTICES				
1	Record of best/innovative practices by the institution			
2	College Activity Register/ Annual Report			
3	Hard Copy of AQAR			
4	Over All Impression on the College			
Signature of the Deputy Director				
		Signatures of Academic Advisors		
Signature of the Director		1		
		2		
IQAC Co-ordinator				

8.2.3 Actions Taken and Continuous Improvement

Based on academic audits recommendations during the assessment period, the Department has implemented several improvement measures. These include strengthening of lesson planning and academic documentation, enhanced use of ICT-enabled teaching tools and digital learning platforms, refinement of internal assessment and result analysis practices, conduct of remedial and reinforcement of mentoring under the Local Guardian scheme. Faculty participation in FDPs, MOOCs, research activities, and professional development programs has increased. Laboratory infrastructure and learning resources have been upgraded to support effective teaching and learning.

The effectiveness of implemented actions is reviewed periodically through IQAC and departmental review meetings. Academic performance indicators such as student results, COs-POs-PSOs attainment levels, placement outcomes, faculty research output, and stakeholder feedback are analyzed. Subsequent academic audit reports reflect improved compliance, strengthened OBE practices, and enhanced teaching-learning effectiveness, demonstrating a closed-loop academic audit and continuous improvement mechanism.

8.3 Improvement in Faculty Qualification/Contribution (15)

Total Marks 15.00

Institute Marks : 15.00

Academic Performance	CAYm1 (2024-25)	CAYm2 (2023-24)	CAYm3 (2022-23)
No. of faculty members with Ph.D. degree	4.00	4.00	1.00
No. of publications in peer reviewed journals	8.00	4.00	2.00
No. of publications in conferences	1.00	1.00	6.00

8.4 Improvement in Academic Performance (10)

Total Marks 10.00

Academic Performance	CAYm1 (2024-25)	CAYm2 (2023-24)	CAYm3 (2022-23)
Academic Performance Index (API) of the First-Year Students in the Program (Refer to section 4.3)	5.95	5.02	4.76
Academic Performance Index (API) of the Second-Year Students in the Program (Refer to section 4.4)	6.73	5.76	6.28
Academic Performance Index (API) of the Third-Year Students in the Program (Refer to section 4.5)	6.21	6.14	5.35

9 STUDENT SUPPORT AND GOVERNANCE (120)**Total Marks 116.00****9.1 First Year Student-Faculty Ratio (FYSFR) (5)****Total Marks 1.00**

Please provide First year faculty information considering load

Name of the faculty member	PAN No.	Qualification	From Engineering Courses	Date of Receiving Highest Degree	Area of Specialization	Designation	Date of joining	Currently Associated (Yes / No)	Nature Of Association (Regular / Contract)	Date Of leaving(In case Currently Associated is 'No')
Mr. Suhas Pan	AVOPS5206M	M.Sc	No	07/06/1995	Physics	Assistant Professor	19/07/2001	Yes	Regular	
Dr. Vijay Kashii	BBAPS8865B	M.Sc. and Ph.D. (Chemistry)	No	25/08/2025	Chemistry	Assistant Professor	19/08/2002	Yes	Regular	
Dr. Satish Vase	AJPPD9106N	M.SC. (Mathematics) and PhD	No	31/01/2017	Mathematics	Professor	01/01/2004	Yes	Regular	
Dr. Vijay Shivaj	ATZPB9674P	M.Sc. (Physics) and Ph.D.	No	23/04/2021	Physics	Associate Professor	13/01/2009	Yes	Regular	
Dr. Amruta Atul	AGVPD0790K	M.SC. (Mathematics) and PhD	No	07/06/2017	Mathematics	Professor	11/08/2009	Yes	Regular	
Dr. Milindkuma	CLEPS7419E	M.Sc. (Physics) and Ph.D.	No	30/04/2016	Physics	Associate Professor	22/09/2010	Yes	Regular	
Dr. Kalpesh An	ACFPI6052B	M.Sc. and Ph.D. (Chemistry)	No	15/07/2021	Chemistry	Assistant Professor	22/09/2010	Yes	Regular	
Dr. Kiran Ekan	CLAPS9948A	M.Sc. and Ph.D. (Chemistry)	No	23/06/2018	Chemistry	Assistant Professor	20/01/2011	Yes	Regular	
Dr. Harshal Sul	AJKPJ1540K	M.SC. (Mathematics) and PhD	No	07/10/2024	Mathematics	Assistant Professor	14/09/2011	Yes	Regular	
Dr. Jamir Salir	CDZPS9785G	M.SC. (Mathematics) and PhD	No	11/11/2024	Mathematics	Assistant Professor	10/08/2012	Yes	Regular	
Mr. Narayan M	AJDPN0210F	M.Sc	No	12/01/2008	Physics	Assistant Professor	13/08/2012	Yes	Regular	
Dr. Pramod Na	BVBPP7371N	M.Sc. and Ph.D. (Chemistry)	No	14/12/2020	Chemistry	Assistant Professor	16/08/2012	Yes	Regular	
Dr. Kishor Rarr	AVGPT0027R	M.A and Ph.D	No	30/11/2022	English	Assistant Professor	12/08/2013	Yes	Regular	
Mr. Samadhan	BCMPP7105E	M.Sc	No	20/07/2011	Mathematics	Assistant Professor	10/01/2022	Yes	Regular	

Miss Ashwini B	ENVPP9173B	M.Sc	No	20/12/2020	Statistics	Assistant Professor	01/06/2022	Yes	Regular	
Miss Pratibha I	EPLPP6196E	M.Sc	No	23/05/2017	Mathematics	Assistant Professor	01/08/2022	Yes	Regular	
Mr. Vijay Moha	AINPI2433C	M.Sc	No	27/09/2021	Mathematics	Assistant Professor	17/08/2022	Yes	Regular	
Dr. Hemant Su	AVGPT6798K	M.Sc. (Physics) and Ph.D.	No	23/12/2019	Physics	Assistant Professor	13/08/2024	Yes	Regular	
Mr. Divyesh R	GHLPM0530B	M.Sc	No	24/07/2023	Mathematics	Assistant Professor	16/08/2024	Yes	Regular	
Miss Prajakta I	GCZPB6958K	M.Sc	No	13/07/2022	Statistics	Assistant Professor	21/08/2024	Yes	Regular	
Dr. Surekha R	ATXPP1665J	M.A and Ph.D	No	02/07/2018	English	Assistant Professor	21/08/2024	Yes	Regular	
Mr. Anil Magan	ASWPA4268N	MA	No	17/07/2007	English	Assistant Professor	21/08/2024	Yes	Regular	
Mr. Jain Milkes	AKCPJ4760E	MBA	No	28/07/2009	Softskill	Assistant Professor	06/08/2012	Yes	Regular	
Mr. Mahendra I	ACPPW4815J	MA	No	28/09/2021	English	Assistant Professor	03/10/2023	No	Regular	30/11/2024
Ms. Pooja Nira	BYBPM3949Q	M.Tech	Yes	21/09/2021	Computer Engineering	Assistant Professor	01/08/2022	Yes	Regular	
Ms. Pramila K	AVXPA0880A	M.E.	Yes	06/04/2016	Computer Science and Engineering	Assistant Professor	06/04/2022	Yes	Regular	
Mr. Raghuvans	BINPR9023C	M.Tech	Yes	16/06/2016	VLSI and Embedded Systems	Assistant Professor	25/07/2016	No	Regular	30/05/2025
Mrs. Kavita Sa	CEJPD2233M	M.E.	Yes	27/11/2018	Electronics and Telecommunication	Assistant Professor	01/12/2022	Yes	Regular	
Mrs. Sneha M	AUSPG1346B	M.E.	Yes	28/10/2015	Electronics and Telecommunication	Assistant Professor	07/08/2023	Yes	Regular	
Mrs. Tejal Raje	DBKPG6377J	M.Tech	Yes	14/12/2020	Computer Sciences and Engineering	Assistant Professor	17/08/2023	Yes	Regular	
Mr. Amit Rajen	BCCPM3917R	M.Tech	Yes	30/12/2013	Digital Communication	Assistant Professor	12/07/2010	Yes	Regular	
Mr. Krunal Pral	APVPR9510E	M.E.	Yes	05/11/2013	Electronics and Communication	Assistant Professor	04/01/2023	Yes	Regular	
Dr. Chetan Jai	AGVPC4194Q	Ph.D	Yes	04/08/2025	Civil Engineering	Assistant Professor	01/02/2012	Yes	Regular	
Mr. Jitendra M	AKWPJ7776L	M.Tech	Yes	10/08/2016	Structural Engineering	Assistant Professor	02/11/2020	Yes	Regular	
Mr. Aakash Su	BCCPP7296L	M.E.	Yes	18/02/2015	Infrastructure Engineering and Management	Assistant Professor	22/08/2012	Yes	Regular	

Mr. Nitish Jagd	CDFPP9268P	M.Tech	Yes	11/12/2018	Computer Science and Engineering	Assistant Professor	28/08/2025	Yes	Regular	
Minakshi Hans	FQYPP5302K	M.E.	Yes	31/05/2025	Information Technology	Assistant Professor	14/07/2025	Yes	Regular	
Mr. Patil Manoj	APBPP3815L	M.Tech	Yes	28/07/2005	Thermal and Fluids Engineering	Assistant Professor	15/07/2006	Yes	Regular	
Dr. Jamadar Pr	ALZPJ7551M	Ph.D	Yes	03/10/2025	General Mechanical	Assistant Professor	01/08/2011	Yes	Regular	
Dr. Baviskar Pz	AMTPB0878Q	Ph.D	Yes	03/06/2025	Mechanical Engineering	Assistant Professor	01/08/2011	No	Regular	16/06/2025
Mr. Sachin Nar	DXYPP6227A	M.Tech	Yes	05/07/2017	CADCAM	Assistant Professor	01/07/2024	Yes	Regular	
Mr. Janardan E	DCPPB3984N	M.Tech	Yes	22/06/2023	Mechanical Engineering	Assistant Professor	28/08/2025	Yes	Regular	
Mr. Rathod Nin	CILPR8064E	M.Phil	No	12/10/2014	Helath and Wellness	Assistant Professor	08/08/2013	Yes	Regular	
Ms. Amerah Bz	AWVPA4225C	M.E.	Yes	12/10/2018	Computer Science and Engineering	Assistant Professor	01/04/2023	Yes	Regular	

Year	Sanctioned intake of all UG programs (S4)	No. of required faculty (RF4= S4/20)	No. of faculty members in Basic Science Courses & Humanities and Social Sciences including Management courses (NS1)	No. of faculty members in Engineering Science Courses (NS2)	Percentage= No. of faculty members $\frac{((NS1*0.8) + (NS2*0.2))}{(\text{No. of required faculty (RF4)})}$; Percentage= $\frac{((NS1*0.8) + (NS2*0.2))}{RF}$
2023-24(CAYm2)	600	30	19	15	61
2024-25(CAYm1)	900	45	24	16	50
2025-26(CAY)	900	45	24	17	50
Average Percentage					53.56

A. Institute Level Mentoring System

The institution has established a robust and structured mentoring system termed as Local Guardian (LG) System to ensure the academic progress, emotional well-being, discipline, and holistic development of students.

Objectives

The system functions through a Local Guardian and Class teacher model, wherein faculty members act as mentors and guide students continuously throughout the academic journey. This mechanism promotes students attention, early identification of issues, and timely intervention. The Local Guardian System aims to

- Monitor students' academic performance and attendance regularly
- Identify students' strengths, weaknesses, and learning gaps
- Provide academic, personal, emotional, and career guidance
- Enhance parent-teacher-student interaction
- Reduce absenteeism and improve retention
- Prepare students for career readiness and employability and all-round personality development

Local Guardian (LG) System Allocation Structure: The Institute has implemented a structured Local Guardian (LG) System to provide continuous academic, personal, and career guidance to students in alignment with Outcome-Based Education (OBE). In the first year, a faculty mentor is assigned to a group of 1:20 students (Minimum) to support not only academic orientation but overall development for employment.

From the second year onwards, departmental faculty take over as local guardians and continue mentoring the same group until graduation, ensuring consistent monitoring, personalized guidance, and holistic development. In the final year, the system is further strengthened through alumni involvement, offering career guidance, placement support, industry exposure, and professional networking.

Multi-Level Mentoring Mechanism: The Institute follows a multi-level mentoring system involving Faculty Members, the Head of the Department, the Head of the Institution, and Alumni to ensure comprehensive academic, personal, and professional support for students.

The mentoring system functions at various levels, namely the Faculty Members, the Head of the Department, and the Head of the Institution, and Alumnus ensuring comprehensive academic and personal support for students. Each class is assigned a Class Teacher responsible for maintaining detailed student profiles, regularly monitoring attendance and academic progress, and identifying areas requiring support or intervention. The Class Teacher/Local Guardian also acts as a key link between the institution and parents through regular communication, while providing counselling and continuous mentoring to guide students in their academic, personal, and professional development

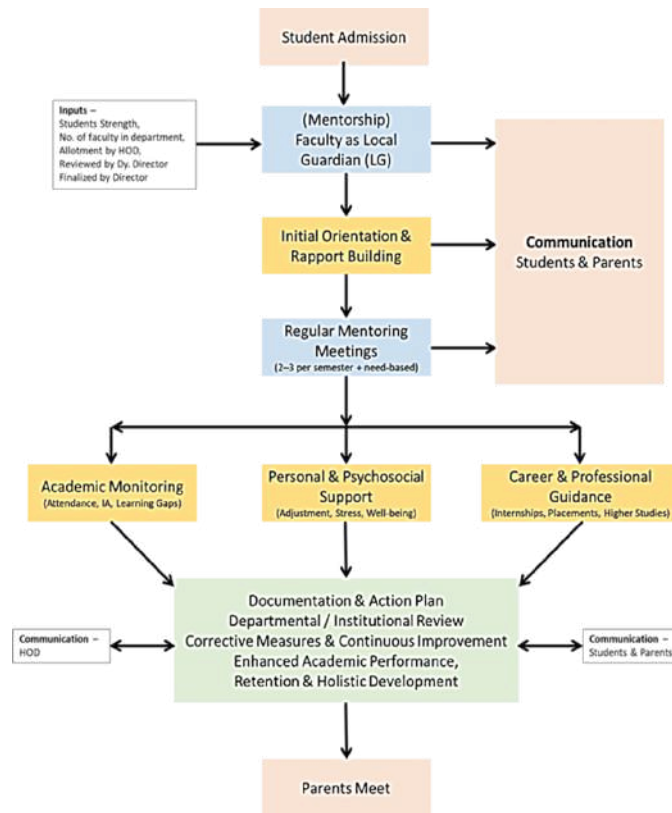


Figure 9.2.1: Structure and Process of the Local Guardian Mentoring System

Each student is assigned a faculty member as a Local Guardian (LG) who provides continuous academic and personal support, ensuring personalized guidance, early identification of issues, and timely intervention throughout the academic year (Refer Figure 9.2.1: Local Guardian System Framework).

Mentoring Process and Record: Each Local Guardian maintains LG student's record which includes:

- Semester-wise attendance details
- Test marks and End Semester Examination (ESE) results
- Mentoring meeting minutes & Parent communication/calling records

Roles and Responsibilities of Local guardians: The Local Guardian acts as the primary link between students, parents, and the Institute, supporting academic progress and personal well-being. The Local Guardian maintains records of attendance and academic performance, conducts regular one-to-one mentoring, identifies academic or personal issues through continuous monitoring, communicates with parents, and ensures timely intervention through institutional support systems when required.

Frequency and Mode of Mentoring: Structured mentoring is implemented through regular and need-based interactions to ensure continuous academic monitoring, personalized support, and timely intervention.

- Frequency: 2 to 3 meetings are conducted in a semester.
- Need-Based Support: Additional mentoring sessions are arranged for slow learners, frequently absent students, and those facing academic or personal challenges.
- Physical Mode: One-to-one and group mentoring sessions.
- Online Mode: ERP system, Parent App, telephonic/Whatsapp communication, and virtual meetings.

Parent Involvement and Monitoring: The Institute ensures continuous parent-faculty engagement through structured meetings and digital communication for effective monitoring of student progress.

- Attendance and academic performance are communicated through official letters and warning notices.
- Semester-wise Parent–Teacher Meetings are conducted to discuss academic performance and overall development.
- Proactive local guardian communication with parents is carried out in cases of absenteeism, poor performance or behavioral issues.
- Same-day ERP alerts are sent to parents for student absenteeism.
- A dedicated Parent App enables parents to track attendance, examination results, and academic progress on a regular basis.

Career, Skill Development and Professional Mentoring: The objective is to strengthen industry–academia collaboration through MoUs and integrate industry-relevant skills into the academic framework. This initiative aims to enhance employability, career readiness, and global exposure in alignment with Outcome-Based Education (OBE).

- A comprehensive Student Orientation and Induction Program is conducted at the beginning of Program & to support smooth transition from school to college.
- Students are introduced to academic regulations, code of conduct, institutional facilities, support systems, and career opportunities.
- Employability Skill Development Program (ESDP): Semester-wise aptitude training and online assessments through Campus Credential.
- Psychological well-being is recognized as essential for academic success and holistic development.
- Foreign Language Cell: Guidance for international exams, language proficiency, and global career opportunities.
- The Institute has active MoUs with industries, training organizations, and CSR partners to strengthen industry–academia collaboration under OBE.
- Alumni Mentorship Program: Career guidance, placement preparation, and industry exposure through alumni support.

B. Effectiveness of the Local Guardian (LG) System

The mentoring system supports Outcome-Based Education (OBE) through continuous academic, career, and personal guidance with timely identification of learning gaps and remedial actions. It enhances student performance, motivation, ethical values, and employability, leading to improved PO-PSO attainment.

- Improved Academic Performance: Continuous monitoring and personalized mentoring have enhanced internal and end-semester results.
- Reduced Absenteeism: Proactive tracking, ERP alerts, and parent communication have minimized absenteeism.
- Early Identification of At-Risk Students: Timely detection of academic and personal issues enables prompt remedial and counselling support.
- Better Retention and Progression: Sustained mentoring has reduced dropouts and improved semester-wise progression.
- Stronger Parent–Institute Connect: Regular interactions and digital communication have increased transparency and involvement.
- Enhanced Confidence and Motivation: One-to-one guidance has fostered positive academic attitude and self-confidence.
- Holistic Development: Integrated academic, emotional, and co-curricular support promotes all-round growth.
- Improved Career Readiness: Alumni mentoring, ESDP, and industry MoUs strengthen employability skills.
- Psychological Well-Being: Institutional and professional counselling support student mental health.

9.3.1 Feedback on Teaching and Learning Process and Corrective Measures Taken, if any (5)

Institute Marks : 5.00

The institute has established a structured and systematic feedback mechanism to obtain meaningful inputs from students on the Teaching–Learning Process and Academic Facilities. In addition to formal feedback tools, suggestion boxes installed at prominent locations on campus enable students to share concerns and suggestions freely.

Feedback is treated as a key quality enhancement tool and is regularly collected and analyzed for academic planning, faculty development, and infrastructure improvement, ensuring informed decision-making, transparency and continuous improvement across all programs.

Objectives

- To systematically obtain structured feedback from students on the Teaching–Learning Process and academic facilities.
- To assess the effectiveness of teaching practices and adequacy of infrastructure supporting learning.
- To identify strengths and improvement areas in academic delivery and facilities.
- To implement timely corrective and preventive actions based on feedback analysis.
- To enhance student satisfaction, engagement and overall academic experience.
- To institutionalize a continuous quality improvement mechanism through review and monitoring.

Institute has established, institutionalized and effectively implemented a systematic feedback mechanism to evaluate and continuously improve the Teaching–Learning Process across all undergraduate engineering programs.

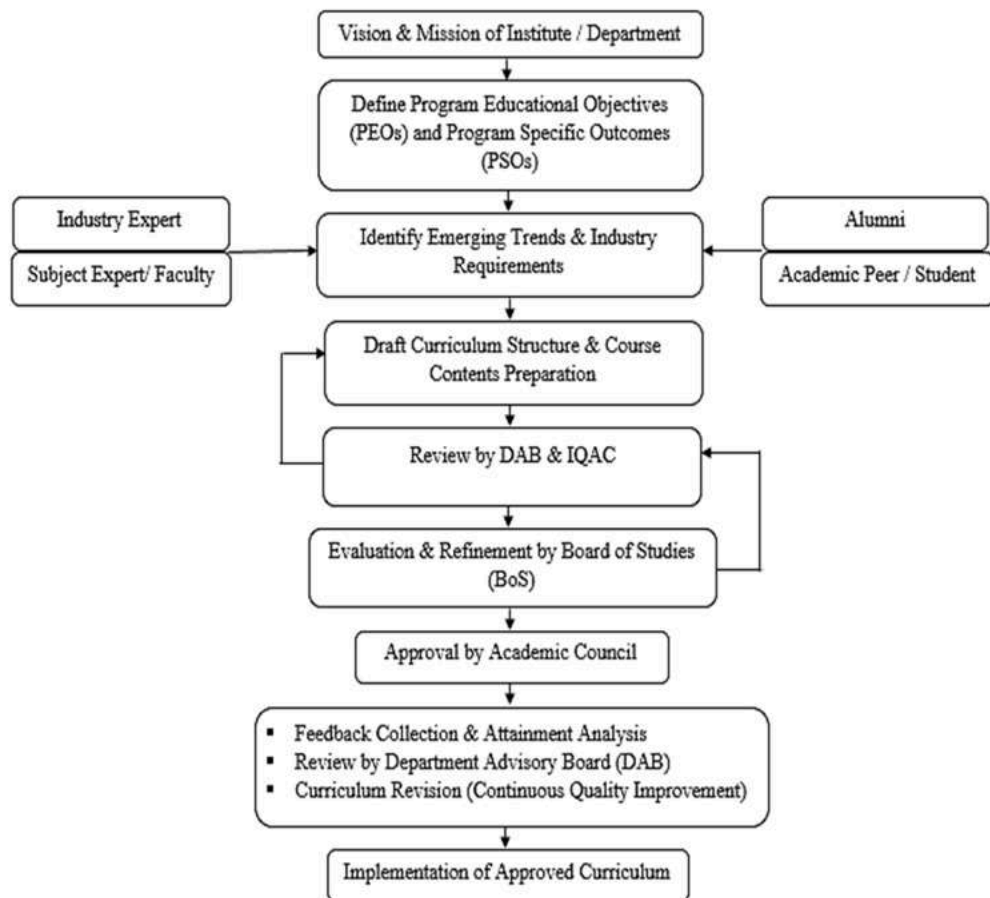


Figure 9.3.1.1: Process Flowchart for Student feedback system.

Feedback on the Teaching–Learning Process is collected regularly through an online feedback system. The process is coordinated by a designated committee to ensure confidentiality, transparency, and unbiased responses. The institute has established a systematic mechanism to collect and review feedback on faculty and academic activities for continuous improvement. (Refer Figure 9.3.1.1)

A. Feedback questionnaire used

The Teaching–Learning Process feedback tool is thoughtfully designed to ensure holistic evaluation of teaching effectiveness across academic, pedagogical, and professional dimensions. The questionnaire covers key aspects of the teaching–learning process. (Refer Figure 9.3.1.2)

QUESTIONNAIRE FOR STUDENT FEED BACK ABOUT THE TEACHER			
1. Does the teacher come well prepared for the class?	a. Never	b. Sometimes	c. Always
2. The teachers English, Presentation and teaching skills are	a. Unsatisfactory	b. Satisfactory	c. Good
3. How is the teacher's voice?	a. Not audible	b. Difficult to hear	c. Loud & Clear
4. How the teacher works on white board / smart board?	a. Shabby	b. satisfactory	c. Neat & clear
5. Does the teacher allow you to ask questions and answer the questions you have asked?	a. Never	b. Evades	c. Always
6. Does the teacher revise and ask questions, which are relevant to the topic discussion?	a. Never	b. Rarely	c. Always
7. Does the teacher give sufficient examples and solve previous examination problems in the class?	a. Never	b. Rarely	c. Always
8. Does the teacher assist you in laboratory and solve laboratory related problems in the class?	a. Never	b. Rarely	c. Always
9. Does the teacher give assignments and check the assignments?	a. Never	b. Rarely	c. Always
10. Does the teacher come in time to class and take class till the end of the hour?	a. Never	b. Sometimes	c. Always
11. Does the teacher neglect the acts of indiscipline in the class and outside the class?	a. Always	b. Sometimes	c. Never
12. How is the teacher's assessment of your internal assessment (test) books?	a. Erratic	b. Very Strict	c. Correct
13. Does the teacher favor some group of students while evaluating internal test books and regarding other issues?	a. Always	b. Can't say	c. Never
14. Does the teacher dictate the notes in the class?	a. Never	b. <25%	c. >25%

Figure 9.3.1.2: Questionnaire for Student Feedback on the Teaching–Learning Process

- Faculty preparedness, depth of subject knowledge, and systematic lesson planning.
- Clarity of communication, effectiveness of presentation, and audibility of voice.
- Appropriateness of teaching methodology and effective utilization of the teaching resources.
- Effectiveness of concept revision, questioning techniques, and problem-solving approach.
- Use of relevant examples, previous examination questions, and support during laboratory sessions.

- Quality of assignment design, fairness in evaluation, and timeliness of feedback.
- Punctuality, maintenance of classroom discipline, and professional conduct.
- Fairness, transparency, and objectivity in internal assessment processes.
- Classroom engagement practices including eye contact, approachability, and overall teaching style.

B. Feedback Analysis

The institution follows a well-defined and transparent mechanism for collecting and analyzing student feedback to enhance the quality of the teaching–learning process. This structured approach ensures continuous academic improvement through systematic evaluation and review. The process shown in Figure 9.3.1.3, consistently records an average student participation of 80% to 95%, demonstrating wide coverage, representativeness and reliability of the feedback data.



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Overall Feedback

Ques No.		a. Count	a. Multiplied	a. Sub Total	b. Count	b. Multiplied	b. Sub Total	c. Count	c. Multiplied	c. Sub Total	Obtained	Total	Percentage
1.		3	1	3	7	3	21	37	6	222	246	282	87.23%
2.		2	1	2	8	3	24	37	6	222	248	282	87.94%
3.		2	1	2	7	3	21	38	6	228	251	282	89.01%
4.		3	1	3	11	3	33	33	6	198	234	282	82.98%
5.		3	1	3	7	3	21	37	6	222	246	282	87.23%
6.		3	1	3	7	3	21	37	6	222	246	282	87.23%
7.		4	1	4	6	3	18	37	6	222	244	282	86.52%
8.		3	1	3	5	3	15	39	6	234	252	282	89.36%
9.		2	1	2	9	3	27	36	6	216	245	282	86.88%
10.		1	1	1	4	3	12	42	6	252	265	282	93.97%
11.		3	1	3	13	3	39	31	6	186	228	282	80.85%
12.		2	1	2	7	3	21	38	6	228	251	282	89.01%
13.		5	1	5	12	3	36	30	6	180	221	282	78.37%
14.		2	1	2	12	3	36	33	6	198	236	282	83.69%
Total Students:		47									3413	3948	8.64
Overall Feedback						Excellent							

Figure 9.3.1.3: Sample Faculty Feedback Report.

The student feedback system consists of 14 structured questions, as shown in the figure to evaluate the Teaching–Learning Process. Each question has three response options, namely Option A, Option B, and Option C, with scaling factors of 1, 3, and 6 respectively.

Let n be the total number of students who submitted feedback. The maximum marks for each question are calculated as $6 \times n$. The score for a faculty member for each question is calculated by multiplying the number of responses for Option A by 1, Option B by 3, and Option C by 6, and then dividing the total by $6 \times n$ to normalize the score.

$$S = \frac{(n_A \times 1) + (n_B \times 3) + (n_C \times 6)}{6 \times n}$$

Where: n_A , n_B , n_C represent the number of responses received for Options A, B, and C respectively. This process is repeated for all 14 questions. The cumulative score obtained is then converted to a 10-point scale, based on which performance grades are assigned as per following table and based on that corrective actions are by the higher authorities.

8.0 to 10	6.0 to 7.9	4.0 to 5.9	2.0 to 3.9	0.0 to 1.9
Excellent	Good	Satisfactory	Un-Satisfactory	Poor

C. Corrective Measures

The institution follows a structured approach to enhance faculty performance by providing corrective support where needed and recognizing excellence. This ensures continuous improvement, professional development, and motivation among teaching staff.

- Faculty members receiving feedback grades greater than 8.0 are issued appreciation letters. Those receiving grades between 6.0 and 7.9 are given advisory notes, while appropriate corrective actions are taken by higher authorities for faculty members receiving lower feedback grades.
- Advised to participate in FDPs, STTPs, workshops, webinars, conferences, and industrial visits.
- Guided to prepare structured lecture notes and course materials.
- Encouraged to complete NPTEL and other certification courses.
- Positively considered in Faculty Appraisal Performance Indicator (API) evaluations.

9.3.2 Feedback on Academic Facilities (5)

Institute Marks : 5.00

During the assessment period, the institute systematically collected feedback from students to ensure the adequacy, effectiveness, and continuous improvement of academic and support infrastructure. The feedback focused on students' perceptions of facilities essential for a conducive teaching-learning environment and overall campus experience. In addition to the formal feedback process, students could report facility-related issues through direct communication with laboratory assistants, local guardians, course teachers, class teachers, class coordinators, HoD.

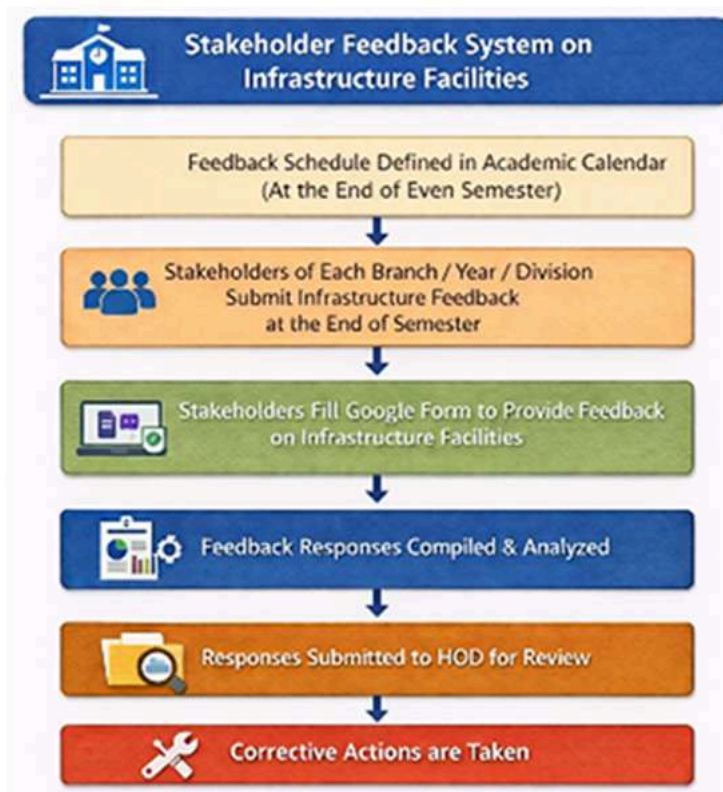


Figure 9.3.2.1: Mechanism for Student Feedback on Infrastructure Facilities

This multi-level approach enabled prompt identification and resolution of day-to-day operational issues. (Refer Figure 9.3.2.1).

A. Feedback questionnaire used

This questionnaire is designed to collect feedback from students regarding the availability, quality, and effectiveness of academic facilities, infrastructure, and support services provided by the institute (Refer Table 9.3.2.1). The responses will help identify strengths and areas for improvement in order to enhance the overall learning environment and campus experience.

Table No.9.3.2.1: Questionnaire for Academic Facilities Feedback.

Sr. No	Statement	1	2	3
Academic Facilities				
1	Classrooms are well-maintained and conducive to learning			
2	Laboratories are adequately equipped and regularly maintained			
3	Library resources meet academic needs			
4	Internet/Wi-Fi connectivity is reliable across academic blocks			
Technical & Digital Infrastructure				
5	Computer labs provide sufficient hardware/software			
6	Smart classrooms and digital tools enhance teaching quality			
7	Hostel rooms are clean, safe, and well-maintained			

8	Mess facilities provide hygienic and nutritious food			
9	Security measures in hostels are adequate			
Campus Environment & Amenities				
10	Campus cleanliness and waste management are Satisfactory.			
11	Sports, Gym and recreation facilities meet student Needs.			
12	Medical and emergency facilities are accessible.			
13	Transportation and parking facilities are adequate.			
Support & Services				
14	Administration responds promptly to facility-related issues			
15	Maintenance & repair requests are resolved in a Timely Manner.			

Rate each statement on a scale of 1 to 3, Where: 1 = Dissatisfied | 2 = Neutral | 3 = Satisfied

Stakeholders provided their responses on the following facility-related aspects:

- Classrooms: Smart boards/projectors, lighting, seating arrangements, ambience and air-conditioning facilities.
- Departmental and Central Laboratories: Availability and adequacy of hardware, software, tools and equipment.
- Library and Learning Resources: Access to books, journals, e-resources and other study materials.
- Computing, Wi-Fi, and Internet Connectivity: Reliability, speed and accessibility.
- Cleanliness and Ambience: Maintenance, sanitation and overall campus environment.
- Power Backup: Availability and reliability of uninterrupted power supply.
- Safety and Security Facilities: Adequacy of safety measures, security systems and emergency preparedness.
- Common Amenities and Student Support Services: Availability and effectiveness of facilities such as cafeterias, rest areas and student support offices.

The stakeholder facility feedback consists of 15 structured questions, as shown in the Table No.9.3.2.1, designed to evaluate the adequacy and effectiveness of institutional facilities supporting the Teaching–Learning Process. Each question provides three response options, namely Option A, Option B, and Option C. For each question, the number of responses received for Option A and Option B is calculated. If the combined percentage of responses for Options A and B exceeds 80% of the total responses, the facility is considered satisfactory and no improvement is required. If this percentage is less than 80%, the issue is identified for attention and appropriate corrective measures are initiated.

B. Frequency of Feedback and Its Impact

Feedback is collected annually for three consecutive assessment years and consolidated for analysis under the supervision of the IQAC. Feedback from formal tools and informal channels is reviewed through committee discussions to identify gaps and recommend appropriate corrective and preventive actions at departmental and institutional levels for continuous quality improvement.

The institute collects stakeholder feedback on infrastructure once every academic year at the end of the even semester, as specified in the academic calendar. Students from each branch and division submit their feedback through online forms, which is then compiled and analyzed by the department. The results are reviewed by the Head of the Department, and necessary corrective actions are implemented. This regular feedback system helps improve classrooms, laboratories, digital infrastructure, and campus facilities, thereby enhancing the overall teaching–learning environment and student experience.

C. Observations and Corrective Actions

The feedback analysis highlighted several areas requiring improvement in infrastructure and facilities. Stakeholders indicated the need for smart boards, upgraded classrooms, air-conditioning facilities, and overall improvement in physical infrastructure. Concerns were also raised regarding internet speed and connectivity, power backup systems, and availability of adequate laboratory resources. Additionally, there was a requirement for updated software and technical tools, along with improvements in cleanliness, hygiene, safety measures, and the overall campus ambience to support a better academic environment.

Based on the feedback received, the institute implemented several corrective measures to enhance the infrastructure and learning environment. These included the installation of smart boards, improvement in classroom lighting, AC upgrades, and modernization of classroom facilities. The institute also increased internet bandwidth, strengthened power backup systems, upgraded laboratories, updated software resources, and improved library and lift facilities. Furthermore, efforts were made to enhance campus safety, sanitation, and housekeeping, while also promoting student clubs, digital learning platforms, sports facilities, and outreach activities to create a more supportive and engaging campus environment.

The Institute has established a comprehensive, structured, and continuously monitored Training and Placement Support system to enhance students' employability, career readiness, higher studies preparedness, and professional progression. The system explicitly addresses training support, scheduled training calendar, career guidance and counseling, industry interaction for pre-placement and internships, placement facilitation, and support for higher studies, Outcome-Based Education (OBE), and NEP 2020. The Institute has a dedicated Training and Placement Cell responsible for planning, organizing, and implementing training and placement activities for students of first year to final academic year.

A. Infrastructure and Facilities for Training and Placement Cell

Training and Placement Cell focus on Trainings, Placements and for Career guidance to students by taking help of Alumni strength and interaction with industry. TPC has a well-established infrastructure to cater to the said services. The career guidance to students is done at well-structured one to one mentoring and through professional counseling. Pre-placement and industry-specific training are done at every stage of their undergraduate studies.

Objectives of Placement Cell:

- To Enhance students technical, behavioral, and leadership skills.
- Facilitate certifications, mock interviews, resume building, and soft-skill grooming.
- To Bridge the gap between Industry and Academic Practices MOU'S-Memorandum of Understanding with Industries.
- To Share the Experience and Expertise of alumni through Alumni-student mentorship and Industry personal for students Benefit.
- To organize various Workshops, Training Programs with Joint Participation of the faculty and The Industries.
- To organize industrial visits and industry interaction programs for students to provide practical exposure to real-world working environments.
- To offer career counseling and professional guidance along with foreign language training (Japanese and German) to choose suitable career paths and higher education opportunities.
- To create and facilitate employment and internship opportunities by establishing strong linkages with industry and corporate organizations.
- To match students' skills, competencies, and interests with appropriate job profiles, ensuring better employability and career alignment.

Training and Placement Organizational Structure: The Training and Placement Cell is headed by the Director, who provides overall policy direction, leadership, and periodic review to ensure alignment with the institution's vision and outcome-based education (OBE) framework. The Training & Placement Advisory Committee, chaired by the Deputy Director, supports strategic planning, industry linkage development, and continuous monitoring of placement-related activities.

The Head – Training & Placement (TPO) is responsible for the overall coordination, execution, and effective implementation of training, internships, and placement processes. The TPO acts as the central point of contact between students, faculty, alumni, and industry partners.

The cell is supported by specialized functional units focusing on Industry Interaction & Placement, Alumni Interaction for Placement, Training & Skill Development, and Career Guidance & Higher Studies, ensuring comprehensive student support from skill enhancement to career planning. (Refer Figure 9.4.1) At the operational level, Department Placement Coordinators provide department-wise support, maintain student and placement data, and coordinate departmental activities. Student Placement Coordinators assist in student communication, logistics, and smooth conduct of training programs, industrial visits, and placement drives, ensuring efficient and transparent placement operations. (Refer figure 9.4.2)



Figure 9.4.1: Training and Placement Cell – Organizational Hierarchy

Pre-Placement Preparation Facilities of training and placement cell: The Training and Placement Cell provides comprehensive pre-placement preparation facilities to equip students with the required technical skills, aptitude, soft skills, and professional readiness for employment and higher education opportunities.

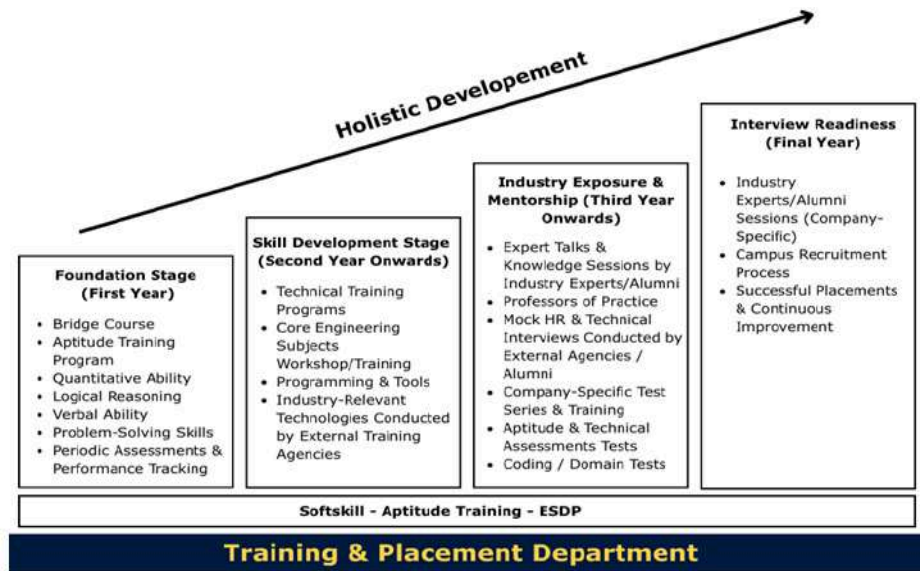


Figure 9.4.2: Training and Placement Framework for Holistic Development

Table No.9.4.1: Training & Skills Enhancement Facilities.

Skills	Facilities
Aptitude & Soft Skill Training	<ul style="list-style-type: none"> • Basic English communication. • Quantitative aptitude. • Logical reasoning and numerical analysis. • Resume writing & Group discussion sessions. • Mock personal interview sessions.
Computer & Language Proficiency Courses	<ul style="list-style-type: none"> • C, C++, Java programming. • AWS • HTML, CSS, SQL • Japanese & German language proficiency.
Core Domain Placement Assisted Training Courses	<ul style="list-style-type: none"> • CCNA. • Electrical Automation. • AutoCAD (2D), CREO & Unigraphics • Revit Architecture. • PLC / SCADA • SME-oriented technical training

B. Adequate Staff for Training & Placement Support

To align academic processes with industry requirements and enhance student employability, the Industry–Institute Interaction Cell has been constituted and has been functioning effectively since the academic year 2013–14. The members of the cell are listed below.

Table No.9.4.2: Training & Placement Staff

Sr. No	Name of Member	Post/Designation
1	Prof. Milkesh P. Jain	Head-Industry Institute Interaction Cell/TPO

Sr. No	Name of Member	Post/Designation
2	Prof. Krunal P. Rane	Assistant TPO
3	Prof. Dr. Pandit S. Patil	T & P Coordinator
4	Prof. Dr. Vinit V. Patel	T & P Coordinator
5	Prof. Mayur J. Patil	T & P Coordinator
6	Prof. Akash S. Pawar	T & P Coordinator
7	Prof. Krunal J. Gandhi	T & P Coordinator
8	Prof. Kailas D. Deore	T & P Coordinator

The Training & Placement Cell is led by the Head – Training & Placement (TPO) and supported by an Assistant TPO, Department Placement Coordinators, and Student Placement Coordinators for effective coordination and smooth execution of placement activities. (Refer Table 9.4.2 and 9.4.3)

The cell is further strengthened by trained faculty and industry experts from platforms such as Code Chef, Campus Credentials and Japanese German language, who conduct structured training, workshops, mock interviews, and career guidance aligned with industry requirements.

Table No.9.4.3: List of trainers associated with T&P Department.

Sr. No	Trainer Name	Skill Specialization
1	Mr. Harjot Singh Guliani	Aptitude
2	Mr. Musharraf Hassan	Aptitude
3	Mr. Vishwajeet Dhuppe	Aptitude
4	Mr. Sachin Bhosale	Aptitude
5	Mr. Jay Prakash	Aptitude
6	Mr. Nishant Thakare	Aptitude
7	Mr. Sumit Gaikwad	Aptitude
8	Mr. Manish Thakur	Technical IT
9	Mr. Raunak Mitra	Technical IT
10	Mr. Ashish Gadpayle	Technical IT
11	Mr. Prashant Jha	Technical IT
12	Mr. Akash Satdeve	Technical IT
13	Mr. Jayesh Raut	Technical IT
14	Mr. Prashant Shinde	Technical IT
15	Mr. Ganesh Bhosle	Verbal/Soft Skill
16	Mr. Rakesh Palkhe	Verbal/Soft Skill
17	Mr. Noor Ahmad	Programming and Coding
18	Mr. Jivan Jyoti	Programming and Coding
19	Mr. Pavan Kumar Rao	Japanese language
20	Miss. Reena Meena	German language

C. Pre-Placement Training Activities & Placement Process

The Training and Placement Cell provides comprehensive career guidance, industry exposure, and skill development support to enhance students' employability, entrepreneurship, and higher education prospects.

These activities are systematically planned to align student aspirations with industry expectations and outcome-based education goals.

- Placement-Oriented Counseling: Mock interviews, resume building, and interview readiness workshops in coordination with academic departments.
- Alumni Mentorship & Industry Exposure: Alumni mentoring, expert talks, and global industry exposure sessions to provide real-world insights.
- Industry Interaction: Guest lectures, workshops, industrial visits, pre-placement talks, and employer feedback for skill-gap identification.
- Internship Support: Internship facilitation through MoUs, alumni networks, internship drives, and implementation of the Institute Internship Policy.
- Placement Support: Pre-placement training (aptitude, technical, soft skills), resume and profile development, mock recruitment activities, and employer engagement.
- Higher Studies Support: Guidance for GATE, GRE, TOEFL, IELTS, CAT, and assistance with applications and documentation.

Improved career clarity, enhanced employability skills, increased placements and internships, higher studies admissions, and entrepreneurial orientation. The Training and Placement (T&P) process is a structured and systematic approach designed to guide students from career orientation to final placement. (Refer Figure 9.4.3)

It ensures effective coordination between students, the institute, and recruiting organizations, while also focusing on skill development, transparency, and continuous improvement.

Step-by-Step Process

- Orientation session by T&P for third-year students on available career options.
- Students submit placement policy/undertaking forms and indicate their area of interest.
- Expert, technical, and alumni talks are organized to brief students on industry trends.
- T&P department contacts and invites companies for campus recruitment.
- Recruiters share job details, eligibility criteria, and selection procedures.
- Interested students register through Google Forms or company-specific portals.
- Details of eligible and interested students are shared with company HR teams.
- Students are informed about recruitment schedules and selection processes.
- Pre-placement training is provided, including aptitude, technical, GD, and PI sessions.
- Companies visit the campus and conduct recruitment activities.
- Final selection list is announced by the recruiting company.
- T&P department circulates the selected students' list to all stakeholders.
- Recruitment records and employer feedback are documented.
- Exit meeting is conducted to review outcomes and suggest improvements.
- Student feedback is collected and used for further enhancement of the process.

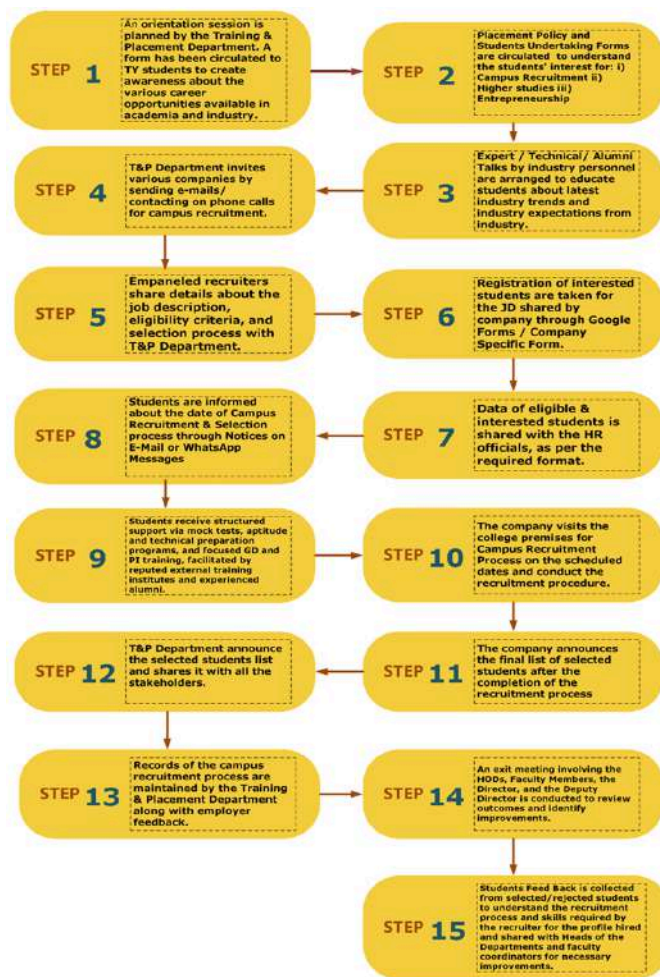


Figure 9.4.3: Process Flow of Training & Placement Activities

The Training and Placement (T&P) Cell plays a crucial role in organizing continuous and structured training programs to enhance student employability. During the academic year 2023–24, 11 training programs were conducted, which increased to 16 in 2024–25 and further to 17 in 2025–26, reflecting the institution’s sustained commitment to career readiness.

Table No.9.4.4: Year-wise Number of Training Programs Conducted by the Training & Placement Cell

Academic Year	Academic Year	Academic Year
2025-26	2024-25	2023-24
17	16	11

In 2025–26, the T&P Department organized diverse skill enhancement and pre-placement training programs. The Department has established a total of 30 Memoranda of Understanding (MoUs) in collaboration with reputed industries, organizations, and professional agencies to enhance academic quality, skill development, and student employability.

Out of these, 16 MoUs are focused on technical skill development, undertaken in collaboration with organizations such as CodeQuotient Pvt. Ltd., Sunrise Mentors Pvt. Ltd. (Coding Ninjas), Sorting Hat Technologies Pvt. Ltd. (CodeChef), Kruxonomy Consulting Pvt. Ltd. (MachineHack), Tessolve Semiconductor Pvt. Ltd., Campus Credentials, R3 Systems India Private Limited, Ambtronics Engineers Pvt. Ltd., Zitics Private Limited, Casepoint Private Limited, Esamyak Software Pvt. Ltd., EagleByte Solutions Pvt. Ltd., Infosys Limited (Springboard), Make MyCareer WCF, and CodeChef, facilitating structured training in core engineering skills, emerging technologies,

and industry-relevant competencies. In addition, 5 MoUs are dedicated to soft skill and holistic development, in association with RPG Foundation, Centum Foundation, Effective German Academy, and Yen Academy, focusing on aptitude development, communication skills, life skills, foreign language training, and overall career readiness.

Table No.9.4.5: Sample Activities conducted by the T&P Department

Sr. No	Name of Training Activity / Program	Skills / Focus Area	Target Students	Resource Person / Agency
1	Full Stack Developer Program	Full Stack Developer	Final Year	Symbiosis Pune
2	Softskill/Aptitude Training Program (Batch 1)	Softskill/Aptitude Training	Final Year	The Barclays GTT Foundation
3	Softskill/Aptitude Training Program (Batch-2)	Softskill/Aptitude Training	Final Year	The Barclays GTT Foundation
4	Mahindra NAANDI Foundation- Batch 1 (life, soft, communication, interview skills)	Life skill, soft skill, communication, interview skills	Final Year	Naandi Foundations Mahindra
5	Mahindra NAANDI Foundation- Batch 2 (life, soft, communication, interview skills)		Final Year	Mahindra Naandi Foundations
6	Mahindra NAANDI Foundation- Batch 3 (life, soft, communication, interview skills)		Final Year	Mahindra Naandi Foundations
7	Ethnus Training Program-FSD MERN	FSD MERN	Final Year	Infosys Foundation
8	Ethnus Training Program-AWS	AWS	Final Year	Infosys Foundation
9	r3 Sys Training IT skill development	IT skill development	Third Year	R3 Systems India Private Limited
10	r3 Sys Training_2026 for IT skill development	IT skill development	Second Year	R3 Systems India Private Limited
11	Technology Training Program	Technology Training	First to Final Year	Infosys Springboard

Sr. No	Name of Training Activity / Program	Skills / Focus Area	Target Students	Resource Person / Agency
12	Future Skills Development Program	Future Skills Development	Final Year	Symbiosis FSD
13	Java Project Based Learning	Java Project Based Learning	Final Year	Wipro TalentNext

Further, 9 MoUs are generic in nature and are utilized for academic interaction and allied activities such as project-based learning, internships, remote assignments, consultancy work, placement support, expert lectures, workshops, résumé building, syllabus revision, social outreach, and industrial exposure. These generic MoUs are established with Guruji Foundation, TCS Ltd., Persistent Systems (Pune), ISKCON Shirpur, Shirpur Constructions/Quantum, Dataserve Infotech Pvt. Ltd. (Pune), CVDragon India, Shalaka Pvt. Ltd., and Konark Global Pvt. Ltd. Collectively, these collaborations significantly enhance experiential learning, industry exposure, professional competence, and continuous academic enrichment of students, thereby strengthening their overall industry readiness.

Notable programs included Full Stack Development training with Symbiosis Pune and Infosys Foundation Ethnus, AWS training, Java and Database training under Wipro Talent Next, Infosys Springboard initiatives, soft skill programs with Barclays GTT Foundation, and life skills training through Nandi Foundation in association with Mahindra. Specialized programs such as Zensar ESD, r3 Sys training, and Japanese and German language courses further strengthened students' global competencies.

Table No.9.4.6: Calendar of Training Activities / Programs

Sr. No	Activity (Training /soft skill)	Month and Duration	No of Hours	Target Students
1	Bridge courses and induction program	September	70 Hrs.	FY
2	Employability and Skill Development Program (ESDP)	September to March	40 Hrs.	FY
3	Employability and Skill Development Program (ESDP)	September to March	40 Hrs.	SY
4	Employability and Skill Development Program (ESDP)	September to March	40 Hrs.	TY
5	Internship	January to June	6 Months	B.Tech
6	Alumni Interactions	Periodically (year-round)	45Hrs.	FY/SY/ TY/B.Tech
7	Foreign language training (Japanese/ German)	Periodically (year-round)	180Hrs.	FY/SY/ TY/B.Tech
8	Industry Expert sessions	Periodically (year-round)	65Hrs.	SY/TY/ B.Tech
9	CodeChef	Periodically (year-round)	4Hrs Weekly	FY/SY/ TY/B.Tech
10	Mock Interview	Periodically (year-round)	Department and T&P Level	FY/SY/ TY/B.Tech
11	Full Stack Developer Program	July	100+ Hrs.	Final Year

Sr. No	Activity (Training /soft skill)	Month and Duration	No of Hours	Target Students
12	NAANDI Foundation-Batch (life, soft, communication, interview skills)	June	36 Hrs.	Final Year
13	Ethanus Training Program-FSD MERN	July/ Sept	100+ Hrs.	Final Year
14	Ethanus Training Program-AWS	July	100+ Hrs.	Final Year
15	r3 Sys Training IT skill development	July	200+ Hrs.	Final Year
16	Technology Training Program Infosys Springboard	July	150+ Hrs.	Final Year
17	Future Skills Development Program Symbiosis FSD	Sept	100+ Hrs.	Final Year
18	Java Project Based Learning Wipro TalentNext	August	150+ Hrs.	Final Year

D.Support for Higher Studies.

Regular career guidance sessions and one-to-one counseling are organized to guide students towards placements, higher studies, competitive examinations, and entrepreneurship. The Institute provides comprehensive and continuous career guidance and counseling support to students through the Training and Placement Cell (TPC) in coordination with academic departments and institute-level leadership.

The objective is to guide students towards placements, higher studies, competitive examinations, entrepreneurship, and global career opportunities.

Structured Career Guidance Mechanism

- Regular career guidance sessions are conducted to create awareness about career options in core engineering, IT, higher education, government services, and entrepreneurship.
- One-to-one counseling sessions are organized for students to identify individual strengths, career interests, and skill gaps, and to provide personalized career roadmaps.

Meetings with Institute Authorities

- Periodic meetings with the Training and Placement Officer (TPO) and Training and Placement Cell (TPC) are conducted to guide students on placement strategies, internship planning, resume preparation, and recruitment process expectations.
- Career guidance meetings with the Director are organized to motivate students, provide strategic direction, and align academic performance with long-term career goals.

Support for Global Careers and Higher Studies

- Career guidance sessions conducted by the Dean – Foreign Language focus on international career opportunities, foreign language proficiency (Japanese, German, etc.), and pathways for global employment and higher studies abroad.
- Students are guided regarding international certifications, language requirements, and cross-cultural career readiness (Goethe, JLPT).

Foreign Language Training

The International Relations and Higher Studies Cell is a testament to our institutions commitment to bridging academic boundaries and creating a global learning environment. Foreign Language Cell. Under the Foreign Language Cell, RCPIIT actively promotes global employability and cross-cultural competence among students by offering structured foreign language training programs.

The institute currently conducts Japanese and German language programs, aligned with international industry requirements and higher education opportunities. To strengthen academic and industry collaboration, Memoranda of Understanding (MoUs) have been established with relevant language training and professional organizations.

These collaborations facilitate expert-led training, webinars, workshops, and guidance sessions, providing students with exposure to global career pathways, international work culture, and overseas education prospects.

The Foreign Language Cell regularly organizes:

- Certified training programs in Japanese and German languages
- Webinars and expert talks by language professionals and industry experts
- Career guidance sessions highlighting international job opportunities and higher studies
- Collaborative activities under MoUs, including mentoring and skill-oriented workshops

Table No.9.4.7: List of Recruiter Visited 2024-25 Batch

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
1	Zydus	E&TC,Electrical,Mechanical	On Campus
2	TSS	Comp,DS,AI ML,E&TC,	On Campus
3	Rheal Software	Comp,DS,AI ML,E&TC,	On Campus
4	Squad Synergy	Electrical	On Campus
5	Johnson Controls	E&TC,Electrical,Mechanical	Off Campus
6	Recruit CRM	Comp,DS,AI ML,E&TC,	Off Campus
7	Patseer	Comp,DS,AI ML,E&TC,	On Campus
8	Quality Kiosk	Comp,DS,AI ML,E&TC,	On Campus
9	Fox Solutions	E&TC,Electrical,	On Campus
10	Zeal Manufacturing	E&TC,Electrical,	On Campus
11	Tessolve	E&TC,Electrical,	On Campus
12	CodeQuotient	Comp,DS,AI ML,E&TC,Civil,Electrical, Mechanical	Off Campus
13	Faurecia	E&TC,Electrical,Mechanical	Off Campus
14	Probian Tech Pvt Ltd	Civil	On Campus
15	Green Design	Civil	On Campus
16	Ambetronics Engineering Pvt Ltd,Mumbai	E&TC,Electrical,Mechanical	On Campus
17	Nvidia	Comp,DS,AI ML,E&TC,	Off Campus
18	Tech Mahindra	Comp,DS,AI ML,E&TC,	Off Campus
19	Delhivery	Comp,DS,AI ML,E&TC,Civil,Electrical, Mechanical	On Campus

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
20	Wonder Cement	E&TC,Electrical,Mechanical	Off Campus
21	Sayeesh Infrastructure	Civil	Off Campus
22	Eagle Byte	Comp,DS,AIML,E&TC	On Campus
23	Apmosys Tech	Comp,DS,AIML,E&TC	On Campus
24	Endurance Technologies Ltd.	Electrical,Mechanical	Off Campus
25	Indovance Pvt. Ltd.	Civil	On Campus
26	Quantum Industries	Civil	On Campus
27	Campus Credentials	Comp,DS,AIML,E&TC,Electrical,Mechanical	On Campus
28	WebTech	Comp,DS,AIML,E&TC,Electrical,Mechanical	On Campus
29	Yamai Technologies	E&TC,Electrical,Mechanical	On Campus
30	Wind Hans Technologies	Electrical	Off Campus
31	Bharat Urja Electricals & Engineering	Electrical	Off Campus
32	InfraBeat Technologies Pvt. Ltd.	Comp,DS,AIML	Off Campus
33	Bit2Sky India Pvt. Ltd	Comp,DS,AIML	Off Campus
34	Cipher Web Infotech	E&TC	Off Campus
35	R3Sys India Pvt.Ltd.	Comp,DS,AIML,E&TC	On Campus
36	RSB Techno Services	Electrical	Off Campus
37	Fuelmatrix	E&TC	Off Campus
38	Kirloskar Pneumatic Company Limited	Mechanical	Off Campus
39	Maharashtra State Board Vocational Education and Training Skill development (MSBSVET)	Comp,DS,AIML,E&TC	On Campus

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
40	Suzlon	Electrical,Mechanical	On Campus
41	AISOLO	Comp,DS,AI ML,E&TC	On Campus
42	RDC concrete	Civil,Electrical,Mechanical	Off Campus
43	Jabil	E&TC,Electrical	Off Campus
44	Primus Techsystems Private Limited	Comp,DS,AI ML,E&TC	Off Campus
45	Talento	Comp,DS,AI ML,E&TC	Off Campus
46	Microdynamic Software Private Limited	Comp,DS,AI ML,E&TC	Off Campus
47	Hiliks Technologies Ltd.	Civil	On Campus
48	Reliance	Civil,Electrical,Mechanical	Off Campus
49	Humming Byte Technologies Pvt. Ltd	Comp,DS,AI ML,E&TC	Off Campus
50	BuildINT	Comp,DS,AI ML,E&TC	On Campus
51	Jackson Green	Civil	On Campus
52	WebLine	Comp,DS,AI ML,E&TC	On Campus
53	Codeest	E&TC,Electrical	On Campus
54	SJ Contracts	Civil	On Campus
55	Siddharth Carbochem	Mechanical	Off Campus
56	Suroj Buildcon Pvt Ltd	Civil	On Campus
57	Hitachi Astemo	Mechanical	On Campus
58	Bombay Flying Club	E&TC,Mechanical	On Campus
59	Entecrese Labs	E&TC,Electrical,Mechanical	On Campus
60	Cybernetics Software Pvt. Ltd	DS	Off Campus
61	Twin Engineers Pvt.Ltd.,Pune	Mechanical	Off Campus

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
62	Megha Engineering	Civil,Electrical,Mechanical	On Campus
63	Webber Electrocorp	Comp,DS,AI ML,E&TC	On Campus
64	Altimetrik	Comp,DS,AI ML	On Campus
65	STEMx India	E&TC,Electrical	Off Campus
66	Celebal	Comp,DS,AI ML,E&TC	Off Campus
67	Angel CAD CAM	Mechanical	Off Campus
68	CIE Automotive	E&TC,Electrical,Mechanical	Off Campus
69	Ashra Filters Pune	Comp,DS,AI ML,E&TC,Civil,Electrical, Mechanical	Off Campus
70	Dhanvanthri Engineers Pvt Ltd Mumbai	Electrical	Off Campus
71	Tau Power Electronics Pvt Ltd	E&TC,Electrical	Off Campus
72	Welspun Corp Limited(Sintex)	Mechanical	On Campus
73	Virtuoso Projects and Engineers Pvt. Ltd.	E&TC	On Campus
74	JBM Auto	Electrical	On Campus
75	Mungi Engineers	Electrical,Mechanical	On Campus
76	Nimap	Comp,DS,AI ML,E&TC	On Campus
77	LG Balakrishnan and Bros Ltd	Electrical,Mechanical	Off Campus
78	Paranjape Autocast Pvt. Ltd	Mechanical	Off Campus
79	Cognizant	Comp,DS,AI ML,E&TC,Electrical, Mechanical	On Campus
80	The Nahars Engineering India Pvt Limited	E&TC,Electrical,Mechanical	Off Campus
81	Sutherland	Comp,DS,AI ML,E&TC,Civil,Electrical, Mechanical	Off Campus
82	Tenneco Clean Air India Pvt. Ltd.	E&TC,Electrical,Mechanical	On Campus
83	L&T Technology Services Pune	Mechanical	Off Campus

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
84	GE Vernova, Vadodara	Mechanical	Off Campus
85	SVKM	Civil, Electrical, Mechanical, Comp, DS, AIML, E&TC	Off Campus
86	R&W, Pune	E&TC, Electrical, Mechanical	Off Campus
87	Techbean	E&TC, Electrical	On Campus
88	Lumax	E&TC, Electrical	Off Campus
89	Lear	Comp, DS, AIML, E&TC	Off Campus
90	MRF	E&TC, Electrical, Mechanical	Off Campus
91	SM Auto	E&TC, Electrical, Mechanical	Off Campus
92	Tube Investment India	E&TC, Electrical, Mechanical	Off Campus
93	Jaya Hind Industries Pvt Ltd	Electrical, Mechanical	Off Campus
94	NRB Bearing	Mechanical	Off Campus
95	Navgurukul	Comp, DS, AIML, E&TC	On Campus
96	SISECAM Glass	Civil, Electrical, Mechanical	On Campus
97	The Indian Hume Pipe Co. Ltd	Civil, Electrical, Mechanical	On Campus
98	BizDigital IT Services Private Limited	Comp, DS, AIML	Off Campus
99	Vayve Mobility Pvt Ltd (EVA)	E&TC, Electrical	Off Campus
100	Searce	Comp, DS, AIML	Off Campus
101	Rabbit and Tortoise Technology Solutions	Comp, DS, AIML	On Campus
102	TCS	Comp, DS, AIML, E&TC, Civil, Electrical, Mechanical	On Campus
103	Wipro	Comp, DS, AIML, E&TC, Civil, Electrical, Mechanical	On Campus

Table No.9.4.8: List of Recruiter Visited 2023-24 Batch

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
1	TSS	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
2	Netwin	Comp,DS,E&TC,Electrical	On Campus
3	Casepoint	Comp,DS,E&TC,Electrical	On Campus
4	Zyodus	Comp,DS,E&TC,Electrical,Mechanical	On Campus
5	Tessolve	Comp,DS,E&TC,Electrical	Off Campus
6	RecruitCRM	Comp,DS,E&TC	Off Campus
7	QualityKiosk	Comp,DS,E&TC	On Campus
8	Faurecia	E&TC,Mechanical	Off Campus
9	Metaroll	Civil	On Campus
10	NVIDIA	Comp,DS,E&TC	On Campus
11	Persistent	Comp,DS,E&TC	On Campus
12	Mungi Engineers	Electrical,Mechanical	On Campus
13	CapitalVia	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
14	Grow Steel Tech	Civil	On Campus
15	Hexaware	Comp,DS,E&TC,Electrical	On Campus
16	Plane Inc	Comp,DS	On Campus
17	PrincetonBlue	Comp,DS	On Campus
18	Johnson Controls India	Electrical	Off Campus
19	Sutherland	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
20	IBM	Comp,DS,E&TC,Electrical	Off Campus
21	Eng Consulting Services Pvt Ltd	Civil	On Campus
22	WebLedger	Comp,DS	Off Campus
23	Ambetronics Engineering Pvt Ltd,Mumbai	E&TC,Electrical,Mechanical	On Campus
24	Winsoft	Comp,DS,E&TC,Civil,Mechanical	On Campus
25	Rheal Software	Comp,DS,E&TC,Mechanical	On Campus
26	Wipro Pari	Mechanical	Off Campus

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
27	Midoffice Applications	Comp,DS	Off Campus
28	FinoFy Technologies	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
29	Artyard Design Studio	Civil	Off Campus
30	eSamyak Software	Comp,DS,E&TC,Civil	On Campus
31	Zitics Pvt Ltd	Comp,DS	On Campus
32	Finulent	Civil,Mechanical	On Campus
33	Green Design	Civil	On Campus
34	S J Construction	Civil	On Campus
35	Hiliks Technologies Ltd.	Civil	On Campus
36	Gofloat Technologies Pvt Ltd	E&TC	Off Campus
37	GARTECH Equipments	Electrical,Mechanical	On Campus
38	DESSAN TEXTFAB PVT. LTD.	Electrical,Mechanical	On Campus
39	MSS India Nashik	Mechanical	Off Campus
40	Ampcustech	Comp,DS,E&TC	Off Campus
41	Tech Mahindra	Comp,DS,E&TC	Off Campus
42	PatSeer	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
43	FOX IT	Comp,DS,E&TC,Electrical	On Campus
44	Plastic omnium	Mechanical	On Campus
45	Bayone	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
46	Mitsogo	Comp,DS,E&TC,Electrical,Mechanical	Off Campus
47	SVKM	Comp,DS,E&TC	On Campus
48	Fox Solutions	E&TC,Electrical	On Campus
49	Dataserve	Comp,DS,E&TC	On Campus
50	Indovance	Civil,Mechanical	On Campus
51	Belrise Industries Limited	Mechanical	Off Campus
52	TCS	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
53	EagleByte	Comp,DS,E&TC	On Campus

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
54	Sankey solutions pvt ltd	Comp,DS,E&TC	On Campus
55	MM Nova Tech	Comp,DS	On Campus
56	Paramatrix	Comp,DS,E&TC	On Campus
57	SJ Contracts	Civil	On Campus
58	Quantum Pvt. Ltd	Comp,DS,E&TC,Civil	Off Campus
59	Suroj Buildcon	Civil	On Campus
60	Endo Par Formulation Pharma	Electrical,Mechanical	On Campus
61	Shree Cement	Mechanical	On Campus
62	IGT Solutions	Comp,DS,E&TC	Off Campus
63	Capgemini	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
64	Dali and Samir-Engineering Pvt Ltd	Mechanical	Off Campus
65	Vertiv Energy	E&TC,Electrical	On Campus
66	Varroc Engineering	E&TC,Electrical	Off Campus
67	Sansera Engineering	E&TC,Electrical	Off Campus
68	Rucha Engineering	E&TC,Electrical	Off Campus
69	Flash Pvt Ltd	E&TC,Electrical	Off Campus
70	Lumax Pvt Ltd	E&TC,Electrical	Off Campus
71	Advik Hi Tech Pvt Ltd	E&TC,Electrical	Off Campus
72	S M Auto	E&TC,Electrical	Off Campus
73	AutoComp Panse Pvt Ltd	E&TC,Electrical	Off Campus
74	NAHARS ENGINEERING INDIA PVT.LTD	E&TC,Electrical	Off Campus
75	L G Balkrishnan and Bros Ltd	Mechanical	Off Campus
76	Wonder Cement	E&TC,	On Campus
77	Mylan	E&TC,Electrical,Mechanical	On Campus
78	Microturners	E&TC,	Off Campus

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
79	Jeena Logistics	E&TC,Mechanical	Off Campus
80	Syrma SGS Technology Ltd, Ranjangaon	E&TC,	Off Campus
81	Infosys	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
82	Vilas Javdekar Developers	Comp,DS,E&TC,Civil,Electrical,Mechanical	On Campus
83	TOX PRESSOTECHNIK India Pvt Ltd.	Comp,DS,E&TC	Off Campus
84	Zeal Manufacturing	E&TC,Electrical	On Campus
85	Seatrium	E&TC,Electrical	Off Campus

Table No.9.4.9: List of Recruiter Visited 2022-23 Batch

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
1	Hexaware	Comp,E&TC,Electrical	On Campus
2	Infosys	Comp,E&TC,Civil,Electrical,Mechanical	On Campus
3	Cybage	Comp	On Campus
4	TCS	Comp,E&TC,Civil,Electrical,Mechanical	On Campus
5	Dataserve	Comp,E&TC,Mechanical	On Campus
6	Make My House	Civil,E&TC,Civil,Electrical, Mechanical	On Campus
7	Netwin	Comp,E&TC,Electrical	On Campus
8	360 Realtors	E&TC,Civil,Electrical, Mechanical	On Campus
9	Vilas Javdekar Developers Pune	Civil	On Campus
10	Verzeo	Comp,E&TC,Electrical, Mechanical	On Campus
11	Crave Infotech	Comp,E&TC,Electrical,	On Campus
12	Weblin	Comp,E&TC,	On Campus
13	Tech Mahindra	Comp,E&TC,	On Campus
14	Infinity Structural Solution	Civil,	Off Campus
15	Virtusa	Comp,E&TC,Electrical, Mechanical	On Campus
16	Reliance Jio	Comp,E&TC,Electrical,	On Campus

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
17	Bitwise	Comp,E&TC	On Campus
18	Faurecia	E&TC	Off Campus
19	Rheal Software	Comp,E&TC,Electrical,Mechanical	On Campus
20	Green Design	Civil	On Campus
21	Atos	Comp,E&TC,Electrical,Mechanical	On Campus
22	Smyle Housing Development	Civil,	On Campus
23	Webtech	Comp,E&TC,Electrical,Mechanical	On Campus
24	Mungi Engineers	Electrical,Mechanical	On Campus
25	RecruitCRM	Comp	Off Campus
26	Spinta Solutions	Mechanical	On Campus
27	Clover	Comp,E&TC,Electrical, Mechanical	On Campus
28	Hexaware(PGET)	Comp,E&TC,Electrical, Mechanical	On Campus
29	Fox Soutions	E&TC,Electrical	On Campus
30	Tricera Technology LLP	E&TC,	Off Campus
31	Metaroll	Civil	On Campus
32	ZF India Steering Gear LTD	Mechanical	Off Campus
33	Corbello Construction. Company, Pune	Civil	Off Campus
34	IBM	Comp,E&TC,	Off Campus
35	Veda Engineering Private Limited	Mechanical	On Campus
36	Cappgemini	Comp,E&TC,Electrical,Mechanical	On Campus
37	Amiti Software Technologies	Comp	Off Campus
38	Nirma	Electrical,Mechanical	On Campus
39	Hitachi	Mechanical	On Campus
40	DTDC	Comp,E&TC,Civil,Electrical, Mechanical	On Campus
41	Deloitte	Comp,E&TC	Off Campus
42	Gridlogics (Patseer)	Comp	On Campus
43	Finulent Solutions	Civil	On Campus

Sr. No.	Name of The Recruiter	Program participated	On/Off Campus
44	Cognizant	Comp,E&TC	On Campus
45	Ekam Venture - Project Management Consultancy (PMC)	Civil	Off Campus
46	Just Dial	Comp,E&TC,Civil,Electrical,Mechanical	On Campus
47	Bedmutha	Mechanical	Off Campus
48	Torpedo Engineering Solutions	Electrical,	On Campus
49	Praj Industries	Comp	On Campus
50	Sulzer	Mechanical	On Campus
51	360 Edge+	E&TC,Civil,Electrical, Mechanical	On Campus
52	Paramatrix	Comp,E&TC	On Campus
53	Patil Automation	Electrical,Mechanical	On Campus
54	Accolite Digital	Comp	Off Campus
55	Axcess io	Comp	Off Campus
56	GM Mfg services pvt Ltd, Pune	Mechanical	On Campus
57	Emkay casting forging	Mechanical	Off Campus
58	Airbus	Comp	Off Campus
59	KPIT	Comp,E&TC,Electrical,	Off Campus
60	Accenture	Comp,E&TC,Electrical	Off Campus

These initiatives significantly enhance students' communication skills, global mobility, and employability, thereby supporting the institute's vision of holistic student development and contributing effectively to NBA Criterion on Student Support and Skill Development. It has impacted in improved global employability skills, Enhanced readiness for multinational companies and Support for overseas higher studies and international careers.

A. Entrepreneurship cell/ Incubation cell

Students are encouraged to adopt an entrepreneurial mindset through structured start-up and entrepreneurship activities aimed at promoting innovation-based learning and motivating students to transform original ideas into viable businesses. In alignment with national initiatives on innovation and entrepreneurship, these activities help students develop competencies such as problem identification, design thinking, business model development, and self-employment.

To institutionalize these efforts, the institute established the Institution's Innovation Council (IC201811420) in 2018, as per the guidelines of Ministry of Education. The IIC functions as the policy-driven and strategic body responsible for promoting innovation, creativity, intellectual property awareness, and start-up orientation among students and faculty. Working under the framework and guidance of the IIC, the Entrepreneurship Cell (E-Cell) acts as the operational and implementation arm of entrepreneurship initiatives at the institute. (Refer Figure 9.5.1)

Inspired by best practices of premier institutions such as Indian Institute of Technology Bombay, the E-Cell functions with the motto "Creating Job Creators." It comprises faculty coordinator and active student members who plan, organize, and execute entrepreneurship-related activities such as workshops, idea competitions, mentoring sessions, and start-up awareness programs.



Figure 9.5.1: IIC Establishment Certificate

The Institute Innovation Council (IIC) and Entrepreneurship Cell (E-Cell) work in a coordinated manner to promote innovation and entrepreneurship among students. While the IIC provides strategic direction and policy-level support aligned with national initiatives, the E-Cell ensures effective execution and active student participation. This integrated approach has strengthened the institute's innovation ecosystem and fostered a sustainable start-up culture on campus.

Key Initiatives and Support Mechanism

- IIC provides strategic guidance, national alignment, and policy support for innovation activities.
- E-Cell facilitates grassroots-level execution and encourages active student engagement.
- Dedicated incubation environment supports brainstorming, mentorship, and prototype development.
- Access to computers, internet, software tools, and departmental laboratories for idea validation.
- Continuous mentoring by faculty members and industry experts on technical and entrepreneurial aspects.
- Student participation encouraged in Hackathons, business plan competitions, start-up challenges, and national innovation programs.
- Training and awareness programs on Intellectual Property Rights (IPR), patent filing, and funding opportunities.
- Regular organization of entrepreneurship events such as expert talks, Hackathons, boot camps, YUKIT innovation challenges, and business plan competitions.
- Active student involvement and measurable outcomes demonstrate the effectiveness of innovation and start-up initiatives.

B. Activities Conducted

The Table 9.5.1 highlights key entrepreneurship and innovation activities conducted by the institute, showcasing expert involvement, student participation, and measurable outcomes in fostering entrepreneurial and innovation skills.

Table 9.5.1: Details of Entrepreneurship and Innovation Activities Conducted

Sr. No	Resource Person & Organization	Name of Activity	Date	No. of Student	Outcome/ Output
1	Mr. Shaurya Gaikwad Founder & CEO – LEAP & EnterpreneX, Advisory Council Member – HBR	My Story / Building Before Graduation: AI, Startups & Practical Entrepreneurship	22–24 Nov 2025	2000+	Large-scale impact through experiential learning; strengthened startup execution skills and innovation mindset.
2	Mr. Pankaj Kasar AI-ML Engineer, Griffyn Robotech Pvt. Ltd., Pune	Workshop on AI and I4.0 Tools for Innovators and Entrepreneurs	15 Nov 2025	85	Hands-on exposure to AI and Industry 4.0 tools; enhanced technical and entrepreneurial competencies.
3	Prof. Jayesh Badane, Gurumantra Vocational Training Institute, Dhule	My Story / Motivational Expert Session by Successful Innovators & Entrepreneurs	6 Nov 2025	50	Inspired students through entrepreneurial experiences; increased motivation towards startups.
4	Dr. Hemraj Kumavat, IPR Expert, R. C. Patel Institute of Technology, Shirpur	National Level Webinar on IPR Awareness: From Innovation to Patent Filing	29 Aug 2025	800+	Large-scale awareness on patent filing process; motivated students and faculty to pursue IP protection.
5	Prof. Dr. Sanjay L. Kurkute, Founder & CEO – PRISM Technology	Expert Session on “Innovation and Start-up Ecosystem Enablers”	26 Aug 2025	185	Improved understanding of innovation enablers, incubation, funding, and ecosystem support mechanisms.
6	Dr. Santosh Rane, President IIC-SPCE, Mumbai	National-level Webinar on “Lean Start Up Ecosystem”	21 Aug 2025	489	Exposure to lean startup principles and scalable business models; strengthened entrepreneurial thinking.
7	Mr. Jai Veer, Assistant Controller of Patents & Designs, DPIIT (MIC Driven)	Commercialization of Patents & Government Support Systems	26 Apr 2025	100+	Improved awareness of government schemes and patent commercialization mechanisms.
8	Dr. Dara Ajay, IIT Madras (MIC Driven)	Patent to Product	26 Apr 2025	100+	Understanding of converting patents into market-ready products and commercialization strategies.
9	Dr. Sripathi Rao Kulkarni, CSIR Innovation Complex – Mumbai (MIC Driven)	Significance of IP Protection and Commercialization	25 Apr 2025	100+	Awareness on IP commercialization pathways and industry-academia collaboration.

Sr. No	Resource Person & Organization	Name of Activity	Date	No. of Student	Outcome/ Output
10	Dr. Rahul Taneja, Haryana State Council for Science & Technology (MIC Driven)	Mark the Spot: Trademarks Talk	24 Apr 2025	100+	Knowledge of trademark registration and branding protection.
11	Dr. Hemant Khosla, DPIIT (MIC Driven)	Copyright Protection Mechanisms & Case Studies	23 Apr 2025	100+	Clarity on copyright enforcement and legal frameworks.
12	Ms. Anooja Padhee, K&S Partners (MIC Driven)	Copy That! Copyrights Uncovered	23 Apr 2025	100+	Awareness of copyright ownership and protection mechanisms.
13	Dr. Chakravarthy, Mahindra University (MIC Driven)	Importance of Design Protection & Case Studies	22 Apr 2025	100+	Improved understanding of design protection using real-world cases.
14	Prof. Gauri Gargate, IIT Kharagpur (MIC Driven)	Discover More with Design Registrations	22 Apr 2025	100+	Knowledge of design registration procedures and benefits.
15	Prof. (Dr.) Unnat P. Pandit, CGPDTM, DPIIT (MIC Driven)	IP Awareness & Innovation National Development	21 Apr 2025	100+	Understanding of IP's role in national innovation and development.
16	Dr. Sacha Wunsch-Vincent, WIPO (MIC Driven)	Inauguration of IP UTSAV & World Creativity and Innovation Day	21 Apr 2025	100+	Promotion of innovation culture and IP awareness.
17	Dr. Jeeva B, Kumaraguru College of Technology	Protecting IPR & IP Management for Start-ups	20 Mar 2025	70	Understanding of IPR management and TRL concepts.
18	Mr. Subham Sughandi, Founder – Marketing Mantra	Expert Lecture on National Startup Day	16 Jan 2025	80	Exposure to startup branding and marketing strategies.
19	Mr. Dipen Sahu, Innovation Officer, MoE Cell (MIC), Government of India	Orientation & Refresher Session on IIC Objectives & Structure	5 Aug 2024	300+	Improved understanding of IIC governance and operations.
20	Mr. Dipen Sahu, Innovation Officer, MoE Cell (MIC), Government of India	YUKTI Innovation & IPR Repository (YIIR)	2 Aug 2024	300+	Capability to manage and track innovations via YUKTI portal.

Sr. No	Resource Person & Organization	Name of Activity	Date	No. of Student	Outcome/ Output
21	Mr. Dipen Sahu, Innovation Officer, MoE Cell (MIC), Government of India	Strengthening IIC Linkages with ATLS & SICs	31 Jul 2024	200+	Enhanced collaboration with schools and mentorship framework.
22	Mr. Dipen Sahu, Innovation Officer, MoE Cell (MIC),	Innovation Ambassadors Framework & Reward	29 Jul 2024	200+	Faculty and students trained as Innovation Ambassadors.
23	Dr. Yogesh Fulpagare, Cooler Master, Taiwan	Process of Innovation Development	24 Feb 2024	200	Understanding of structured innovation development processes.
24	Mr. Arjun Deshpande, Founder & CEO, Generic Aadhaar	My Story – Motivational Session	21 Jan 2024	150	Motivation through real entrepreneurial journey.
25	Mr. Arjun Malhotra, Co-Founder HCL Group	Innovation & Entrepreneurship Outreach Program	22 Dec 2023	300+	Exposure to entrepreneurship opportunities beyond campus.
26	Hon'ble Prime Minister Shri Narendra Modi	Launch of "Viksit Bharat@2047: Voice of Youth"	11 Dec 2023	500+	National-level awareness on innovation-led nation building.

C. Student Start-ups: Evidence of Innovation-Driven Outcomes

Structured innovation activities, supported by continuous mentoring from trained faculty and Innovation Ambassadors, enabled students to acquire practical entrepreneurial skills, resulting in registered student start-ups, active founders, and award-winning participation at multiple levels—evidencing innovation-driven outcomes.

Table 9.5.2: Details of Student Start-ups and Founders

Sr. No	Name of Founder	Start-Up Name	Registration No.
1	PRATHAMESH MALI	STEMSAGE	ACG-9397
2	OM PATIL	DRONI CULTURE SYSTEMS PVT. LTD	AAY-3425
3	RAHUL BAVISKAR	SWADESHI HANDICRAFTS PVT. LTD	U51310MH2021PTC358417
4	TEJAS PAWAR	MWS SOLUTION	UDYAM-MH09-0015846
5	ROHIT LOHAR	VIVA-TECHNOLOGY DRIVEN SPONSOR ENGAGEMENT	ACP-1208
6	GIRASE TEJAS	ALLINO	Incubated at DBATU, Lonere



Fig 9.5.3: Glimpse of students Achievements

Motivated by this exposure and mentoring support, some students further initiated their own start-up ventures, translating innovative ideas into entrepreneurial outcomes. These achievements reflect the effectiveness of the institute's entrepreneurship initiatives in nurturing innovation, self-employment, and job creation among students.

Faculty members have been trained as Innovation Ambassadors to strengthen the institutional innovation ecosystem. Currently, 09 faculty members have completed Innovation Ambassador training, and 03 have successfully completed Advanced Innovation Ambassador Training under the Institution's Innovation Council (IIC). These trained faculty members play a pivotal role in providing structured mentoring, coaching, leadership, and strategic guidance for innovation, start-up, and entrepreneurship activities conducted through the IIC and E-Cell, ensuring continuity, quality, and measurable impact in entrepreneurial initiatives.

Table 9.5.3: Students Achievements

Sr. No.	AY	Name of Competition	Level	Organizing Agency	Achievement / Position	Outcome
1	25-26	YUKTI Innovation Challenge	National	Ministry of Education	Semi-finalist	Prototype
2	24-25	Youth Ideathon	National	SBI	Top 100 Selection	Idea validation & mentoring
3	24-25	Smart India Hackathon	National	Govt.	Finalist	Prototype

Sr. No.	AY	Name of Competition	Level	Organizing Agency	Achievement / Position	Outcome
4	24-25	Eureka	National	IIT Bombay	Shortlisted for Final Round	Investor pitching
5	25-26	ISF Unicorn Challenge	International	ISF	Selected for Dubai Round	Global exposure
6	24-25	Maharashtra State Innovation Challenge	State	Govt. of Maharashtra	Winner ₹1,00,000 Prize	Funding support

- More than 2,000 students have participated in 26 innovation and entrepreneurship programs organized by the institute.
- Seven student start-ups have been registered or are currently under incubation as a direct outcome of these initiatives.
- Two student teams received ₹1,000,000 each as state-level start-up funding for their innovative ideas.
- Students have secured state-level awards, won national competitions, and achieved recognition in international innovation and business contests.
- These achievements indicate significant improvement in students' innovation, start-up, and entrepreneurial skills.
- A functional Institution's Innovation Council (IIC) has been in operation since 2018 to sustain and guide innovation activities.
- The IIC is supported by structured faculty, expert, and student councils for effective implementation.
- Trained and Advanced Innovation Ambassadors provide continuous mentoring and guidance.
- The institute organizes 15–20 innovation and entrepreneurship activities annually, resulting in increased student participation and a strong innovation-driven start-up culture.

R. C. Patel Institute of Technology (RCPIT), Shirpur, has formulated a comprehensive Institutional Strategic Plan and Institutional Development Plan (IDP) for the period 2023-2030, aligned with its Vision, Mission, and Outcome-Based Education (OBE) framework.

A. Institute Strategic Plan (2020-2030)

A 360 degree perspective plan is developed by an IQAC which considers important factors i.e. structure, mechanisms and stake holders within the system and their capacity to act, their creativity, the collaboration between them, their confidence, and the coherence of the action with other initiatives (Refer Figure 9.6.1.1).

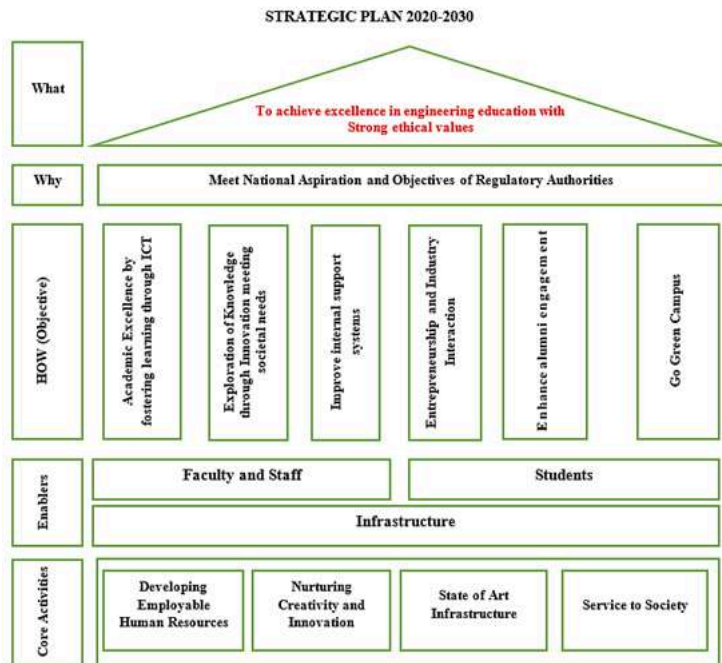


Figure 9.6.1.1: Institutional Strategic Planning Framework (2020-2030)

Goal 1: Academic Excellence by fostering learning through ICT

Values-based Education creates a strong learning environment that enhances academic achievement and develops students social and relationship skills that last throughout their lives. The positive outcomes are achieved through teaching-learning methods blended with ethical values and cross domain research in cutting edge technologies. This leads to the all-round personality development of the students. It also provides social capacity to students, equipping them with social and relationship skills, intelligence and attitude to succeed at every aspect of their lives. A high quality of academic excellence can provide value-added experience for the students.

Table No.9.6.1.1: Strategic Objectives Aligned with Institutional Development

Sr. No	Strategic Plan
1	Academic Excellence by fostering learning through ICT
2	Exploration of Knowledge through Innovation meeting societal needs
3	Improve Internal Support Systems

Sr. No	Strategic Plan
4	Entrepreneurship and Industry Interaction
5	Enhance alumni engagement
6	Go Green Campus

Strategies:

Curriculum Enrichment and Value Addition: Being an affiliating College the HEI has insignificant role in curriculum designing and development. However measures have been taken for Industrial certificate Course, Value added courses and activities sensitizing students to cross-cutting issues such as gender, environment and sustainability, human values and professional ethics, development of creative and divergent competencies.

Table No.9.6.1.2: Key Result Areas and Performance Measures for Academic Quality Enhancement

Key Result Areas	Measures
Curriculum Enrichment	Industrial Certificate Courses
	Courses focusing on Skill development and Employability
	Value Added Courses
Learner Centric Curriculum delivery	Academic Plan as per OBE & Academic calendar
	Quality projects
	ICT utilization / Pedagogy Tools
	Online Self learning Resources
	Industry exposure through Internships
	Workshops/FDPs on Pedagogy/Technology
	Learning Management System
Smart Classrooms	Multimedia and support equipment
	E-Learning Facilities.
Laboratories	Periodic maintenance and up gradation
	Virtual Laboratory
	Additional Design and open ended experiments

Pedagogy and Delivery Modes: The day to day classroom delivery is through modern pedagogy evenly balancing the traditional methodology. The classrooms are equipped with the required infrastructure to facilitate the new modes of delivery. The faculty are trained on the ICT methodologies and continuous apprise of the same is provided through conduct and participation in faculty development programs, workshops and seminars. An exclusive teaching/ learning center is in place to support faculty teaching, student learning and communication. E- Learning / online learning will be encouraged in addition to the traditional class room teaching-learning practice. Faculties and students are encouraged for MOOC- SWAYAM-NPTEL Certification.

Goal 2: Exploration of Knowledge through Innovation meeting societal needs

The Institute addresses and enhances students' imagination, initiative and practical skills and equips them to innovate and confidently cross the threshold of challenges. Strategies as shown in table 9.6.1.3 Added to the academic activity additional open ended experiments, Micro/ Mini Projects, Industrial based projects, Product based projects are encouraged.

Table No.9.6.1.3: Strategic Initiatives for Research Publications, IPR and Collaboration

Key Result Areas	Measures
Research Publications	Numbers of papers published in reputed National and international journals
	Numbers of papers presented in reputed National and international conferences
	Faculty as reviewers for reputed journals
Frontiers of knowledge	Operational Centers of Excellence
	Conferences/seminars/workshops conducted.
	MOUs with higher learning institutes in India & broad.
Patents and copyrights	IPR Workshops
	Number of Indian Patents
	Books and Monograms, Copy rights

The innovative idea of students are transformed into reality by:

- Project Based Learning from micro to macro levels involving processes and products.
- Enhancing collaborative projects with academic institutes, industry.

Goal 3: Improve internal support systems

The Institute has installed a modern and comprehensive Enterprise Resource Planning (ERP) system after streamlining all processes with the aim of improving efficiency and transparency of operations. The number of technical staff in the departments will be increased, including senior staff with higher qualifications. The Institute will provide additional administrative staff to departments to manage routine work such as, arranging admissions and examinations, maintenance, recording minutes of meetings, as well as specialized activities such as publishing newsletters, maintaining website and engaging with industry and alumni.

The Institute will enhance the purchase section to provide greater support for facilitating purchases in a timely manner. A conference/FDP/STTP course support cell will be set up to help arrange conferences/ FDPs/STTPs. The Institute will provide adequate staff and online systems to enable maintenance of the estate and buildings at a higher standard.

Action points

- Simplify systems and processes with a modern ERP system.
- Appoint and empower departmental managers to support and co-ordinate purchase, maintenance and administration in the Department.
- Conduct annual satisfaction survey.
- Service orientation and training for staff, service response and online complaint systems.
- Establish improved faculty orientation and mentorship Programme for new faculty members.
- Create a conference organizing support cell as a part of CEP.

Metrics/Targets

- Reduction in average processing times
- Continuous improvement on satisfaction survey scores
- Tracking and reduction in complaint redressal times

Goal 4: Entrepreneurship and Industry Interaction

The Institute aims to create an ecosystem for deeper collaboration with industry in several modes, including consultancy, sponsored research projects, technology transfer and continuing education. Measures are taken to transform classroom learning to a project based experience. The idea to innovate is encouraged through the Innovation Competition and the best idea is rewarded.

Infrastructure is provided to implant the ideas. Young technocrats get opportunities to exploit their full potential by setting up their own ventures

thus becoming "job generators" rather than "job seekers". Strategy to provide a platform to business Start-ups to develop the innovative ideas into commercially viable products.

Training and mentoring to the students is given through Entrepreneurship Development Cell to realize the idea into application/ product at institute. Initial awareness on entrepreneurship is facilitated by conducting awareness camps, guest lectures, seminars, workshops, and skill development programs.

The Industry Institute Interaction Cell proactively builds partnerships with industry in areas of strengths of the Institute. Collaboration with the industry is built through well-structured student internships and appointment of industry professionals as Visiting Faculty. A significant quantum of research will originate from problems identified as a result of the faculty's engagement with industry.

Table No.9.6.1.4: Strategic Measures for Entrepreneurship and Industry Engagement

Key Result Areas	Measures
Industry Collaboration	Industry Supported Labs
	Student Internships
	Knowledge exchange through seminars and workshops
	Faculty as Corporate Trainer
	Consultancy and Testing to industry
	Sponsored and funded collaborative research
	MOUs with Premier industries
Innovation and Entrepreneurship	Exclusive incubation facility
	Proactive participation of Students and Faculty
	Focus on Product development
Resources & Infrastructure	Exclusive facility for R&D
	Licensed Technologies

B. Approval & Implementation

The objective is to ensure the quality and imbibe the culture of excellence and focus on the time-bound goals set for academic, administrative, research and development activities. The entire process is based on participative approach wherein the faculty members, and other stakeholders are involved in the development of plans and its efficient execution. The summary is as follows

The Strategic Plan clearly focuses on academic excellence, research and innovation, industry engagement, ethical values, faculty and staff development, student development, and transparent governance, with defined timelines, responsibilities, and measurable outcomes. The availability of the Institute's strategic intent, priority areas, and quality assurance mechanisms is reflected through publicly accessible IQAC documentation and quality assurance reports, which function as institutional strategic reference documents and demonstrate openness to stakeholders.

Web evidence:

- IQAC & academic planning framework: <https://www.rcpit.ac.in/iqac-and-academics> (<https://www.rcpit.ac.in/iqac-and-academics>)
- AQAR 2022-23 (strategic focus, quality initiatives, e-governance, monitoring): <https://www.rcpit.ac.in/files/AQAR-2022-23.pdf> (<https://www.rcpit.ac.in/files/AQAR-2022-23.pdf>)

The Institutional Strategic Plan and IDP were approved by the competent authority, namely the Governing Body, after due deliberations. The governance framework supporting strategic approval and oversight comprises the Governing Body, Academic Council, and Finance Committee, ensuring balanced consideration of policy, academic planning, and financial feasibility. The constitution, roles, and statutory nature of these bodies are documented and disclosed through mandatory statutory disclosures available on the Institute website, reinforcing transparency and regulatory compliance.

Web evidence:

- Mandatory Disclosure (Governing Body, Finance Committee, Academic Council, governance structure): <https://www.rcpit.ac.in/uploads/download/1684477044.pdf> (<https://www.rcpit.ac.in/uploads/download/1684477044.pdf>)

- IQAC & Academic Committees page (academic governance linkage): <https://www.rcpit.ac.in/iqac-and-academics-committee> (<https://www.rcpit.ac.in/iqac-and-academics-committee>)

The implementation of the Strategic Plan and IDP is carried out through department-wise annual action plans aligned with institutional strategic objectives. These action plans translate long-term goals into short-term and mid-term initiatives covering curriculum delivery, outcome attainment, research activities, industry interaction, faculty development, student support systems, and governance processes. Alumni actively contribute to implementation through mentoring, curriculum feedback, internships, placements, and professional guidance, facilitated via the Institute's dedicated alumni portal.

Web evidence:

- Alumni engagement and participation platform: <https://alumni.rcpit.ac.in> (<https://alumni.rcpit.ac.in>)

The Internal Quality Assurance Cell (IQAC) through periodic reviews, academic and administrative audits, stakeholder feedback analysis, and preparation of Action

Taken Reports (ATRs) systematically carry out Monitoring and evaluation of the Strategic Plan and IDP. The progress of strategic initiatives, corrective actions, and quality improvement outcomes are documented through Annual Quality Assurance Reports (AQARs) and placed before the Governing Body for review, ensuring accountability, transparency, and continuous improvement. Evidence of continuity and incremental improvement is available through successive AQARs published on the Institute website.

Web evidence:

- AQAR 2022–23 (implementation, review): <https://www.rcpit.ac.in/files/AQAR-2022-23.pdf> (<https://www.rcpit.ac.in/files/AQAR-2022-23.pdf>)
- AQAR 2021–22 (continuity and monitoring incremental improvement outcomes) <https://www.rcpit.ac.in/files/AQAR-2021-22.pdf> (<https://www.rcpit.ac.in/files/AQAR-2021-22.pdf>)

Thus, the Institutional Strategic Plan and IDP of RCPIT are publicly available, formally approved by the competent authority, systematically implemented through departmental action plans, and continuously monitored through IQAC-led mechanisms, with key evidence transparently disseminated through the Institute website, alumni portal, and official communication platforms.

A. Organizational Set-up: Governing Body, Administrative Setup, Functions of Various Bodies

R. C. Patel Institute of Technology has established a clearly defined, participative, and autonomous governance and administrative framework that ensures academic autonomy, transparent administration, financial accountability, and holistic institutional development. The governance system is structured with distinct statutory, executive, academic, administrative, developmental, and functional layers, each with clearly defined roles, approval mechanisms, and documented processes.

At the apex, the Governing Body (GB) functions as the highest statutory authority responsible for policy formulation, strategic direction, institutional oversight, and regulatory compliance. The Academic Council (AC) operates as the apex academic body, ensuring academic autonomy through approval of curricula, academic regulations, assessment frameworks, and Outcome Based Education (OBE) implementation. The Finance Committee (FC) ensures financial oversight, budget approval, and prudent resource allocation. The constitution, roles, and approval of these statutory bodies are disclosed through mandatory statutory disclosures available on the Institute website.

Under the Academic Council, Program-wise Boards of Studies (BoS) function as the primary academic bodies responsible for curriculum design, revision, and academic content development. The recommendations of the BoS are placed before the Academic Council for approval, ensuring a bottom-up, academically rigorous, and industry-relevant curriculum development process, which is a key requirement for autonomous institutions. The Director serves as the chief executive authority responsible for implementation of decisions of statutory bodies and overall institutional administration, supported by the Deputy Director. Execution of academic and administrative functions is carried out through three clearly differentiated yet integrated structures (Refer Figure 9.6.2.1)

- Academic & Assessment Structure, comprising Heads of Departments (HODs) and the Controller of Examinations (COE). The COE ensures transparent, fair, and independent conduct of examinations and evaluations, functioning academically under the Academic Council and administratively reporting to the Director, thereby maintaining separation between teaching and evaluation.
- The functioning of these structures is supported by statutory and functional committees, including the Internal Quality Assurance Cell (IQAC), Purchase Committee (for transparent and need-based acquisition of latest technologies), Recruitment Committee (to attract and select a diverse pool of talent), Student and Employee Grievance Redressal Committees, Anti-Ragging Committee, Internal Complaints Committee (Women Harassment Prevention), SC/ST Cell, Disciplinary Committee, Sports and Cultural Committees, NSS, Student Clubs. All committees function with approved composition, defined roles, documented meeting notices, agendas, minutes, and Action Taken Reports (ATRs).

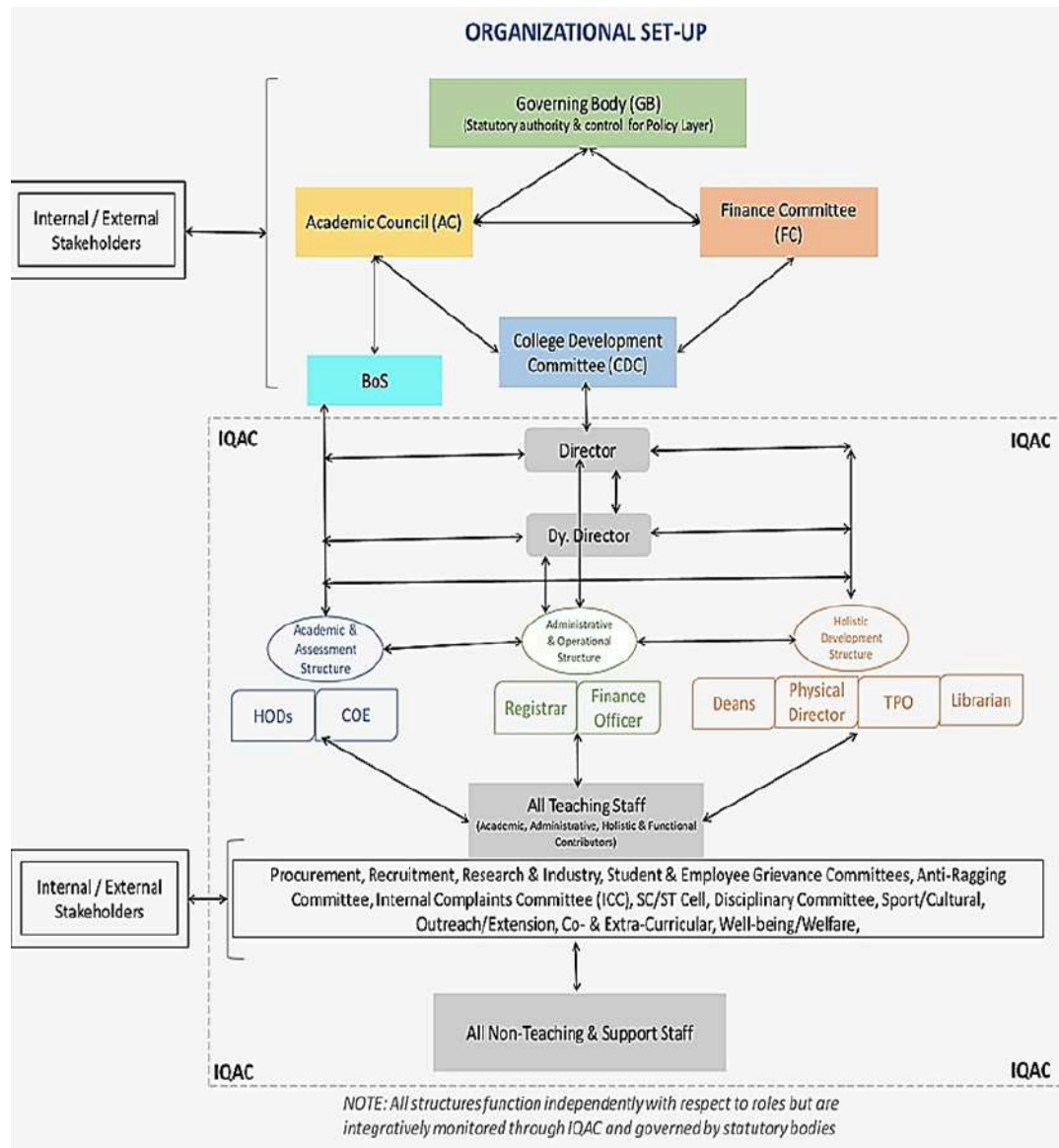


Figure 9.6.2.1: Governance, Leadership and Institutional Support Structure of the Institution

- All teaching and non-teaching staff contribute to institutional functioning through these structures and committees, forming an integrated institutional platform. The entire governance and administrative framework is independently governed by statutory bodies and integratively monitored through IQAC, ensuring transparency, accountability, and continuous quality improvement. The Institute follows documented service rules, recruitment procedures, promotion policies, and procurement norms, which are published through mandatory disclosures on the Institute website.
- Administrative & Operational Structure, comprising the Registrar and Finance Officer, responsible for implementation of service rules, recruitment and promotion procedures, statutory compliance, administrative coordination, financial administration, procurement execution, and audit readiness.
- Holistic Development Structure, comprising Deans, Physical Director, Training & Placement Officer (TPO), and Librarian, focusing on research and innovation, faculty development, student development, employability enhancement, leadership, wellness, sports, cultural activities, learning resources, outreach, and extension activities.

B. Service Rules

R. C. Patel Institute of Technology follows clearly documented service rules for teaching and non-teaching staff, defining service conditions related to appointment, probation, confirmation, workload, leave, performance expectations, disciplinary procedures, grievance handling, and separation.

Web evidence: Mandatory Disclosure:

<https://www.rcpit.ac.in/uploads/download/1684477044.pdf> (<https://www.rcpit.ac.in/uploads/download/1684477044.pdf>)

Service Rule:

<https://www.rcpit.ac.in/academics/servicrules> (<https://www.rcpit.ac.in/academics/servicrules>)

These service rules are aligned with AICTE norms, State Govt. norms, affiliating university guidelines, and management policies, and are implemented through the Registrar under the supervision of the Director. The service rules and related governance provisions are publicly disclosed through the Institute's Mandatory Disclosure, ensuring transparency and stakeholder awareness.

C. Recruitment Procedures

Recruitment at RCPIT is carried out through a transparent, merit-based, and committee-driven process to attract a diverse and competent pool of academic and administrative talent. Vacancies are widely advertised through multiple channels, including print media, the Institute website, and official professional platforms such as LinkedIn, Facebook, Instagram ensuring broad visibility and equal opportunity. Reservation for the posts is applicable as per the applicability to Minority Institutions and is clearly stated in each published advertisement.

The Institute follows flexible recruitment modalities, including online and offline interviews, as well as off-campus interviews and selection processes wherever appropriate, to widen outreach and attract quality candidates. Applications received are scrutinized as per eligibility norms, and shortlisted candidates are invited for structured selection processes.

The Selection Committee is constituted in accordance with institutional and regulatory norms and includes:

- Members of the Governing Body, Director and Deputy Director,
- Concerned Head of the Department (HOD), and
- Two subject experts, including internal and external experts from university affiliated colleges.

The University faculty-selection along with approvals of faculty is carried out as per the guidelines issued by the University. This multi-member committee structure ensures fair evaluation, academic rigor, transparency, and objectivity in selection decisions. The competent authority before appointment approves recommendations of the Selection Committee.

Web evidence:

Mandatory Disclosure (Recruitment procedures and selection framework): <https://www.rcpit.ac.in/uploads/download/1684477044.pdf> (<https://www.rcpit.ac.in/uploads/download/1684477044.pdf>)

Official communication and outreach platforms: <https://www.rcpit.ac.in/careers>, <https://www.linkedin.com/school/shirpurrpcpit/> (<https://www.rcpit.ac.in/careers>, <https://www.linkedin.com/school/shirpurrpcpit/>)

D. Promotion Policies

The Institute follows clearly defined, transparent, and performance-oriented promotion policies for faculty and staff, aimed at ensuring career progression, professional motivation, and retention of talent. Faculty promotions are governed through a structured performance-based appraisal system, wherein faculty members submit an API-based self-appraisal report documenting their contributions in teaching-learning processes, research and publications, professional development, institutional responsibilities, and outreach activities.

Promotions and Career Advancement Scheme (CAS) decisions are processed in accordance with AICTE guidelines, taking into consideration API scores, prescribed eligibility criteria, academic experience, and overall performance. A Performance Evaluation Committee comprising internal and external academic experts, ensuring objectivity and academic rigor, evaluates the appraisal and promotion process. Recommendations of the committee are placed before the competent authority for approval, thereby maintaining fairness, transparency, and compliance with regulatory norms.

To further strengthen transparency and accountability, faculty and staff are provided with an opportunity to seek clarification or raise grievances related to appraisal or promotion decisions through the institutional Grievance Redressal Committee, ensuring due process and equitable resolution.

Web evidence:

Mandatory Disclosure (Promotion policies, appraisal framework, CAS norms): <https://www.rcpit.ac.in/uploads/download/1684477044.pdf> (<https://www.rcpit.ac.in/uploads/download/1684477044.pdf>)

Career Advancement Scheme (CAS) details: <https://www.rcpit.ac.in/academics/CAS> (<https://www.rcpit.ac.in/academics/CAS>)

R. C. Patel Institute of Technology, Shirpur, practices transparent governance and proactive dissemination of institutional information by systematically publishing policies, rules, processes, decisions, and performance-related information through its official website, ERP systems, and digital communication platforms.

Transparency is embedded across academic, administrative, financial, and student-support processes, ensuring accessibility, accountability, and stakeholder confidence.

A. Transparency in Admissions, Fee Structure, and Student-Related Processes

The Institute ensures transparency in admissions, fee structure, and student-related processes through publicly available information on eligibility criteria, admission procedures, fee details, academic regulations, examination rules, and assessment norms published on the Institute website.

An ERP-based e-governance system is implemented to manage admissions, academic records, attendance, assessments, and financial transactions. The ERP provides individual login credentials to students as well as parents, enabling real-time access to academic progress, attendance, examination schedules, fee status, notices, and circulars, thereby strengthening transparency and parental involvement.

All financial transactions related to fees are carried out through online payment modes integrated with the ERP system, ensuring traceability, transaction records, and digital proof of payment. Students and parents receive system-generated acknowledgements and messages confirming transactions, reinforcing financial transparency.

The Institute provides a clear and accessible framework for Government Scholarships, including eligibility criteria, application procedures, timelines, and grievance redressal, through its website and student support offices. This ensures that economically and socially eligible students are well informed and supported.

To further enhance transparency and informed decision-making, the Institute conducts career counselling and orientation programs for prospective students prior to admission, offering clarity on programs, career pathways, employability prospects, and academic expectations. Following admission, structured induction programs are conducted to familiarize students with institutional policies, academic systems, assessment processes, support services, and ethical guidelines, ensuring smooth academic integration.

B. Transparency in Recruitment, Promotion, and Human Resource Governance

Transparency in human resource governance is ensured through publicly disclosed service rules, recruitment procedures, and promotion/Career Advancement Scheme (CAS) policies. Vacancy notifications are disseminated through print media, the Institute website, and official professional platforms, ensuring equal opportunity and wide outreach.

The Institute has adopted HR e-governance practices, including online attendance systems, online leave application and sanctioning mechanisms, and digital service records, ensuring traceability, accountability, and timely administrative processes. Promotion decisions are governed through API-based self-appraisal systems and AICTE guidelines, with committee based evaluation and approval by competent authorities. These digital and policy-driven mechanisms reinforce fairness and transparency in faculty and staff management.

C. Transparency in Procurement, Financial Management, and Decision-Making

The Institute follows a transparent, need-based, and bottom-up procurement mechanism. Academic, research, and infrastructure requirements are first identified at the departmental and functional unit level based on curriculum needs, technological relevance, and student learning outcomes. These proposals are consolidated by the Heads of Departments and forwarded for institutional processing.

The proposals are evaluated by the Procurement / Optimized Buying (OB) Committee, which scrutinizes technical specifications, quality, relevance, cost-effectiveness, and compliance with institutional and regulatory norms. Based on the committee's recommendations, proposals are placed before the Finance Committee for financial scrutiny, budgetary verification, and approval as per delegated financial powers. Thereafter, the approved procurement decisions are placed as a note before the Governing Body for information and institutional oversight, ensuring transparency at the apex governance level. All procurement activities are supported by proper documentation, committee approvals, comparative evaluations, and audit compliance, and financial transactions are recorded through institutional financial systems. This structured approval flow—from departmental initiation to OB Committee evaluation, Finance Committee approval, and Governing Body noting—ensures accountability, traceability, and transparent financial governance.

D. Transparency through Feedback and Performance Monitoring Mechanisms

The Institute ensures transparent monitoring and continuous improvement through structured feedback mechanisms involving students, parents, and faculty, supported by digital platforms and formal review processes.

Student performance assessment is carried out through defined internal and external evaluation mechanisms, and the assessment outcomes, attendance records, and academic progress are made available through the ERP system. The ERP provides secure login access to students as well as parents, enabling real-time visibility of academic performance, internal assessment marks, attendance, examination schedules, and notices. This transparency strengthens parental awareness and involvement in the academic progress of students. To further reinforce transparency and stakeholder engagement, the Institute conducts Students Parents-Faculty meetings, wherein student performance, academic progress, attendance, and areas for improvement are discussed in a structured manner. These interactions ensure open communication, shared responsibility, and timely academic interventions.

Faculty performance feedback is governed through a multi-source mechanism, including structured student feedback on teaching effectiveness and HOD feedback on academic performance and institutional contributions. The outcomes are reviewed by academic leadership and used for performance improvement, mentoring, and faculty development, ensuring transparency and fairness.

E. Governance Transparency through Statutory Bodies

Transparency in governance is ensured by publishing details of statutory and academic bodies, including the Governing Body, Academic Council, Finance Committee, Boards of Studies, and IQAC, on the Institute website. The agendas, minutes of meetings, and Action Taken Reports (ATRs) of these bodies are documented and made accessible through statutory disclosures and quality assurance reports, enabling stakeholders to understand policy formulation and institutional decision-making processes.

F. Grievance Redressal and Stakeholder Support Mechanisms

The Institute maintains transparent and accessible grievance Redressal systems for students and staff through designated committees such as the Student Grievance Redressal Committee, Employee Grievance Redressal Cell, Internal Complaints Committee (Women Harassment Prevention), Anti-Ragging Committee, SC/ST Cell, and Disciplinary Committee. Information regarding grievance procedures, contact details, and escalation mechanisms is published on the Institute website, ensuring fairness and timely resolution.

G. Publicly Available Resources and Digital Communication Platforms

RCPIT actively disseminates institutional information through multiple official platforms, including the Institute website, ERP portals, alumni portal, and social media channels such as LinkedIn, Facebook, and Instagram. In addition, official What Sapp-based circular communications are used for timely dissemination of academic notices, examination schedules, fee reminders, event updates, and emergency information to students and staff. These multi-channel communication mechanisms ensure wide reach and real-time transparency.

H. Extent of Stakeholder Awareness

The effectiveness of transparency initiatives is reflected in high stakeholder awareness, achieved through ERP access, regular circulars, induction and orientation programs, counselling sessions, website updates, and social media outreach. Students and parents actively use ERP logins for academic and financial information, while faculty and staff engage with HR e-governance systems. Alumni, parents, and recruiters remain informed through digital platforms, and feedback collected through IQAC and stakeholder surveys confirms accessibility and awareness of institutional information.

Thus, policies, academic and financial processes, governance decisions, student support, and grievance mechanisms are transparently communicated through ERP systems, institutional websites, and official channels, ensuring effective e-governance and integrated statutory compliance.

9.7 Budget Allocation, Utilization, and Public Accounting at Institute Level (12)

Total Marks 12.00

Total Income at Institute level: For CFY,CFYm1,CFYm2 & CFYm3

CFY : (Current Financial Year),

CFYm1 : (Current Financial Year minus 1),

CFYm2 : (Current Financial Year minus 2) and

CFYm3 : (Current Financial Year minus 3)

Table 1 - CFY

Total Income 411022622				Actual expenditure(till...):	Total No. Of Students	Expenditure per student
Fee	Govt.	Grants	Other sources(specify)			
411022622	0	0	0	265387223.44	3126	84896.74

Table 2 - CFYm1

Total Income 347559054.79				Actual expenditure(till...):	Total No. Of Students	Expenditure per student
Fee	Govt.	Grants	Other sources(specify)			
342049550.00	157850.00	5351654.79	0	347559054.79	2819	123291.61

Table 3 - CFYm2

Total Income 335917998.69				Actual expenditure(till...):	Total No. Of Students	Expenditure per student
Fee	Govt.	Grants	Other sources(specify)			
266009533.00	203955.00	69704510.69	0	335917998.69	2351	142883.03

Table 4 - CFYm3

Total Income 298391116.17				Actual expenditure(till...):	Total No. Of Students	Expenditure per student
Fee	Govt.	Grants	Other sources(specify)			
264594318.00	41828.00	33754970.17	0	298391116.17	2430	122794.70

Items	Budgeted in	Actual Expenses in till	Budgeted in	Actual Expenses in till	Budgeted in	Actual Expenses in till	Budgeted in	Actual Expenses in till
Infrastructure Built-Up	561850C	4003147	155000C	141846E	195000C	179577C	266000C	258036C
Library	301000C	2144543	390000	365810	475000	428611	600000	562977

Laboratory equipment	1931300	1376081	1800000	1633478	4000000	3740419	2030000	1942207
Teaching and non-teaching staff	2001330	1485989	2605000	2580216	2440000	2399152	2083000	2062747
Outreach Programs	1505000	1072271	100000	93515	250000	236479	44000	41828
R&D	2634000	1876475	260000	220720	200000	190765	44000	41417.4
Training, Placement and Industrial	9030000	6433629	7500000	7142410	7200000	6839043	3230000	3035586
SDGs	6533600	4557154	6200000	5892102	7000000	6373556	7640000	7069269
Entrepreneurship	1693000	1206305	150000	139055	175000	168410	142000	133549
Others, specify	1658400	4691188	1500000	720000	7000000	2705775	4000000	4092368
Total	375423000	265387223.11	379400000	356143592.53	352800000	335917998.69	133920000	126973714.36

9.8 Program Specific Budget Allocation, Utilization (8)

Total Marks 8.00

Total Income at Institute level: For CFY,CFYm1,CFYm2 & CFYm3

CFY: (Current Financial Year),

CFYm1 : (Current Financial Year minus 1),

CFYm2 : (Current Financial Year minus 2) and

CFYm3 : (Current Financial Year minus 3)

Table 1 :: CFY

Total Budget 27502196.74		Actual expenditure (till...): 19441354.48		Total No. Of Students 229
Demanded	Actual Allocated	Actual Expenditure	% Spent	Expenditure per student
28702197	27502196.74	19441354.48	67.73	84896.74

Table 2 :: CFYm1

Total Budget 29743667.97		Actual expenditure (till...): 27920444.82		Total No. Of Students 221
Demanded	Actual Allocated	Actual Expenditure	% Spent	Expenditure per student
32343668	29743667.97	27920444.82	86.32	126336.85

Table 3 :: CFYm2

Total Budget 40067035.3		Actual expenditure (till...): 38149768.46		Total No. Of Students 267
Demanded	Actual Allocated	Actual Expenditure	% Spent	Expenditure per student
42667035	40067035.3	38149768.46	89.41	142883.03

Table 4 :: CFYm3

Total Budget 44605092.59		Actual expenditure (till...): 42364170.81		Total No. Of Students 345
Demanded	Actual Allocated	Actual Expenditure	% Spent	Expenditure per student
47205093	44605092.59	42364170.81	89.74	122794.70

Items	Budgeted in	Actual Expenses in till	Budgeted in	Actual Expenses in till	Budgeted in	Actual Expenses in till	Budgeted in	Actual Expenses in till
Laboratory equipment	1414803	1008070	1411138	1280591	4542747	4247945	2882098	2757455
Software	183141.0	1710402	2743881	2711456	5678434	5280865	7098765	5810152
SDGs	4786290	3338414	4860588	4619208	7949808	7238364	1084691	1003661
Support for faculty developmen	36628.20	3516315	6271728	5644555	9085496	8176946	7098765	6814814
R & D	192957.0	1374641	2038311	1730370	2271374	2166493	624691	588025
Industrial Training, Industry exp	661506.0	4713055	5879744	5599406	8176946	7767012	4585802	4309782

Miscellaneous Expenses*	0.00	000	000	000	000	000	000	000
Total	7275328.53	5161457.76	6970241.22	6560603.69	9903190.14	9071381.68	12380814.81	11398384.30

9.9 Quality of Learning Resources (Hard/Soft) (5)

Total Marks 5.00

The institution ensures the quality of learning resources through systematic planning, regular up-gradation, and effective utilization of physical and digital resources to support outcome-based education. These resources are continuously enhanced to meet curriculum requirements, industry expectations, and the diverse learning needs of students.

A. Availability of Learning Resources

LIBMAN - Library Management System: RCPIT Library uses the LIBMAN integrated library management system to automate acquisition, cataloguing, circulation, OPAC, and reporting activities. The system ensures efficient resource management, quick issue-return services, accurate record maintenance, and easy access to library resources for users. (Refer Table 9.9.1)

OPAC: https://libcloud.mastersofterp.in/OPAC_V3/ (https://libcloud.mastersofterp.in/OPAC_V3/)

LIBMAN OPAC (Online Public Access Catalog) is a digital interface for the LIBMAN library management system, allowing users to easily search a library's collection by title, author, subject, keywords, etc., find availability and location, and even check personal account details like borrowed items, all from a web-based or mobile-friendly portal. It acts as an online library card catalog, making resources accessible remotely and improving user convenience with features like consolidated data and detailed book info.

Table 9.9.1: Library Resources and Information Access Facilities

Sr. No.	Particulars	Details
1	Program Name	Engineering & Technology
2	Titles	Hardcopies : 5766, E-Copies: 6620, Total Copies :12386
3	Volumes	Hardcopies : 38609, E-Copies: 620, Total Copies : 45229
4	Name of Journals	UG Journals : 66
	International Journals	International Journals :11
	National Journals	National Journals :55
5	E-Resources	DELNET: E-Journals – 37,847; E-Books – 1,683 N-List: E-Journals – 3,537; E-Books – 31 lakh NDL: E-Journals – 3 lakh; E-Books – 7 lakh Springer E-Journals- 514
6	DBATU's E-consortium	Available
7	Library Facilities	09:00am to 08:00pm
8	Investment till the date	1,77,12,534/-
9	Budget of current year	18,71,000/-
10	Area (In Sqm.)	801 sq. m.
11	Reading Room Capacity	150
12	Reprographic Facility	Available
13	News Paper	English- 2 Marathi- 6
14	Library Networking	Available

Sr. No.	Particulars	Details
15	No. of Multimedia PCs	10
16	Type of Access	Open Access
17	Library Management Software	LIBMAN (Master-soft)
18	Bar-code or RF tab book Handling : Available	
19	e-journals	DELNET :1103, N-List :6069, NDL : 7 lakh
20	DELNET : 10/05/2025 to 09/05/2026 (Rs. 13570/-) N-List (INFLIBNET): Till Process NDL : 29/03/2025 to 29/03/2026 (Free)	

M-OPAC: 100% assurance for import of other library software data into LIB-MAN. Mark standard data import/export. Book data fetching from ISBN site and Google API saves data entry time. Supports Ebook uploading & reading. Follows all library latest standards such as Marc 21, library congress standards, AACR2. Reports / data export to word, excel, PDF, text. Fully secured & maintenance free. Fully documented user manual. Best backup and recovery. Reports on laser/inkjet printers. Lib-Man is embedded with multilingual fonts, Barcode & QR Code fonts. Print barcode using barcode printer like Argox, TSC, etc.

It supports all latest technologies which include cloud hosting, smartphone, tablets, SMS, email, UHF RFID, payment gateway, etc. It also supports smart phone app for book search - MOPAC.

Usage Barcode System: The RCPIT Library uses a barcode-based circulation system that includes barcoded books, borrower cards, and barcode readers. Each user is issued a borrower card with a unique barcode, enabling quick and accurate identification during issue and return transactions.

This system ensures efficient circulation, minimizes manual errors, and maintains reliable usage records through the library management software.

Foreign Language and Quantitative Examination Learning Resource: The institute provides a wide range of quality learning resources, including physical books and online e-learning materials, to support students in foreign language proficiency and preparation for competitive examinations and higher studies.

B. Accessibility of Learning Resources

The Central Library plays a vital role in supporting the Engineering & Technology program by providing extensive print and digital resources, including textbooks, reference books, national and international journals, and e-resources through platforms such as DELNET, N-LIST, NDL, and Springer.

Table 9.9.2: Last three years enhancement

Sr. No.	Details	2023-24	2024-25	2025-26
1	Title	185	132	48
2	Volume	1151	749	197
3	Print Journals	60	72	66
4	E- Resources	DELNET: E-Journals – 37,847; E-Books – 1,683 N-List: E-Journals – 3,537; E-Books – 31 lakh NDL: E-Journals – 3 lakh; E-Books – 7 lakh Springer E-Journals- 514 (Till on 2025) Copyleaks		

The library follows an open-access system and is equipped with modern facilities and library management software to ensure easy and effective access to information. The well-equipped library significantly enhances teaching-learning and research activities by facilitating access to updated knowledge resources, supporting self-learning, project work, and research. Extended working hours, digital access, and adequate reading space contribute to improved academic performance, research output, and overall student learning experience.

Table No. 9.9.3: Foreign Language and Quantitative Examination Learning Resource

Sr. No.	Particulars	Details
1	Foreign Language Learning Resource Books	353
2	Foreign Language Online E- Learning Resource	85
3	Quantitative Examination (GATE, GPAT, MPSC & Other)	600

E- Resource:

The institute provides access to a wide range of digital learning resources and platforms to support academic excellence, skill development, and employability. Subscriptions to national and international digital libraries, virtual laboratories, coding platforms, language learning tools, and industry-supported programs ensure continuous learning beyond the classroom and promote self-paced, outcome-based education.

DELNET: (Development Library Network):

E-Book : 1683, E-Journals: 37847



NDL: - National Digital Library

- E-Book - 7 lakh (Authors-3 lakh & Languages- 70)
- E-Journals - 3 lakh (Authors- 2 lakh)
- Videos - 18000 (Video Lectures from Source 11)
- Thesis - 95000 (Researches from different Indian Institute)

N-List: - INFLIBNET:

- E-Book - 31 lakh
- E-Journals - 3537

Virtual Lab: Virtual Labs are available to students to perform experiments remotely using simulation-based and interactive modules. These labs support conceptual understanding and practical learning beyond regular laboratory hours, especially for core engineering subjects.

Code-Chef: Code Chef is used as a programming practice and competitive coding platform to enhance students' problem-solving, logical thinking, and coding skills. Students participate in practice sessions and contests aligned with curriculum requirements.

Language Lab: The Language Lab supports the development of communication skills, listening, speaking, reading, and writing abilities. It is used for improving professional communication, presentation skills, and employability readiness.

Foreign Language: Foreign language learning specially (Japanese and German) resources are provided through print books and online platforms to help students acquire basic proficiency in international languages, supporting global employability and higher studies.

Infosys Springboard: Infosys Springboard is an online digital learning platform offering free courses in technical, professional, and life skills. Students use the platform for self-paced learning, certification courses, and industry-oriented skill development.

Campus Credentials: Campus credentials are provided to students for authenticated access to subscribed e-resources, digital library platforms, and online learning systems, ensuring secure and seamless utilization of academic resources.

Wipro TalentNext: Wipro TalentNext is an industry-oriented learning initiative that provides students with access to technical training modules, skill development programs, and assessments to enhance employability and industry readiness.

Table No. 9.9.4: Access to e-learning Resources

Sr. No.	Particulars	Details
1	DELNET	https://delnet.in/index.html (https://delnet.in/index.html)
2	NDL	https://club.ndl.iitkgp.ac.in/club-home (https://club.ndl.iitkgp.ac.in/club-home)
3	OPAC	https://libcloud.mastersofterp.in/OPAC_V3/ (https://libcloud.mastersofterp.in/OPAC_V3/)
4	N-List	https://nlist.inflibnet.ac.in/ (https://nlist.inflibnet.ac.in/)
5	E- shodhganga	https://shodhganga.inflibnet.ac.in/ (https://shodhganga.inflibnet.ac.in/)
6	NPTEL	https://nptel.ac.in/ (https://nptel.ac.in/)
7	Swayam	https://swayam.gov.in/ (https://swayam.gov.in/)
8	Foreign Language CD	https://forms.gle/6xRkW5Lo1daX6ndd7 (https://forms.gle/6xRkW5Lo1daX6ndd7)
9	Plagiarism Software (Copy-leaks)	https://copyleaks.com/ (https://copyleaks.com/)
10	Springer Nature 3 Subject Collections	https://link.springer.com/brands/springer (https://link.springer.com/brands/springer)
11	Virtual Lab	https://iitb.vlabs.co.in/outreachportal/ (https://iitb.vlabs.co.in/outreachportal/)
12	Code-Chef:	https://www.codechef.com/college/dashboard (https://www.codechef.com/college/dashboard)
13	Language Lab: I Tell - Orell Talk Corporate Version	https://sesrcp.in/it/login.html (https://sesrcp.in/it/login.html)
14	Infosys Springboard	https://infyspringboard.onwingspan.com/web/en/page/home (https://infyspringboard.onwingspan.com/web/en/page/home)
15	Campus Credentials	https://code.campuscredentials.com/ (https://code.campuscredentials.com/)
16	Wipro TalentNext	https://talentnext.wipro.com/PBLApp/index.jsp (https://talentnext.wipro.com/PBLApp/index.jsp)

All print resources are classified (DDC) and catalogued using LIBMAN ILMS:

All print resources in the RCPIT Library are systematically classified using the Dewey Decimal Classification (DDC) scheme and catalogued through the LIBMAN Integrated Library Management System (ILMS), ensuring easy organization, quick retrieval, and efficient access to learning resources.

Print Resources Access during Library Working Hours:

Print resources in the RCPIT Library are accessible to students and faculty during regular library working hours. During examination periods, library hours are extended by two additional hours to provide enhanced support for study and academic preparation.

Print Journals: To support quality teaching–learning, research, and academic enrichment, the institute subscribes to a wide range of national and international journals across all departments. These journal subscriptions provide faculty members and students with access to recent research findings, emerging technologies, and advancements in their respective disciplines. The table below presents department-wise details of national and international journal subscriptions for the period January to December 2025, highlighting the adequacy and relevance of scholarly resources available to support curriculum delivery, research activities, and continuous professional development.

Table No. 9.9.5: Statistics of Print Journals: National and international journals

Sr. No.	Departments	Total Journals	Total frequency
1	Computer Engineering	12	33
2	CSE (Data Science) Engineering	6	23
3	Artificial Intelligence & Machine Learning Engineering	6	23
4	Artificial Intelligence Data Science (AIDS)	6	17
5	Information Technology (IT)	6	19
6	Electronic and Telecommunication Engineering	12	39
7	Mechanical Engineering	6	18
8	Civil Engineering	6	28
9	Electrical Engineering	6	17

Number of users using library through e-access (OPAC) :

https://libcloud.mastersofterp.in/OPAC_V3/ (https://libcloud.mastersofterp.in/OPAC_V3/)

OPAC Monthly Login Number of Access- 1445

The RCPIT Digital Library actively supports teaching and self-learning by providing online access to syllabus copies, autonomous question papers, OPAC, e-databases, e-resources, newspaper cuttings, and foreign language books/CDs. Usage data shows maximum participation from Computer, Applied Science and Data Science departments. The library is primarily utilized by students (over 96%), highlighting its important role in academic preparation, examination support, and independent learning activities.

The institution has implemented a comprehensive Mastersoft Enterprise Resource Planning (ERP) system to ensure efficient academic administration, student support, transparency, and Outcome-Based Education (OBE) compliance. The ERP integrates all academic and administrative activities into a single digital platform with role-based access for students, faculty, administrators, and management.

Mastersoft Enterprise Resource Planning (ERP)

- **Student Support Module:** The Student Support Module provides end-to-end services for students, including online admission, registration, attendance monitoring, mentoring, grievance Redressal, scholarships, placements, and hostel, transport, and feedback systems. Students and parents have real-time access to academic and attendance information, promoting transparency and student-centric learning.

The screenshot shows the 'Attendance Register Report' interface. At the top, there is a breadcrumb trail: Academic > Examination > E- Learning > Payroll > Establishment > Administration > Obe. On the left, a sidebar lists 'Attendance Management' with sub-items: 'Alternate Attendance Allotment' and 'Attendance Register Report'. The main area is titled 'Attendance Register Report' and contains a form with the following fields:

- Buttons: 'Courses' and 'Free / Global Elective'
- *Session: Please Select
- *Course: Please Select
- *From Date: From Date
- College: Please Select
- Semester: Please Select
- Course Type: Please Select

 At the bottom right, there are three buttons: 'Show', 'Faculty Attendance Register Report', and 'Cancel'.

The screenshot shows the 'Exam Mark Entry By Admin' interface. At the top, there is a breadcrumb trail: Academic > Examination > E- Learning > Payroll > Establishment > Administration > Obe. On the left, a sidebar lists 'Conduction Of Examination' with sub-items: 'Exam Mark Entry By Admin'. The main area is titled 'Exam Mark Entry By Admin' and contains a form with the following fields:

- *School/Institute: Please Select
- *Session: Please Select
- *Degree: Please Select
- *Program/Branch: Please Select
- *Scheme: Please Select
- *Semester: Please Select
- *Subject: Please Select
- *Course: Please Select
- *ExamName: Please Select

 At the bottom right, there are four buttons: 'Show Student', 'Save', 'Lock', and 'Cancel'.

The screenshot shows the 'Result Analysis Report' interface. At the top, there is a breadcrumb trail: Academic > Examination > E- Learning > Payroll > Establishment > Administration > Obe. On the left, a sidebar lists 'Examination Reports' with sub-items: 'Result Analysis Report'. The main area is titled 'Result Analysis Report' and contains a form with the following fields:

- *College: Please Select
- *Session: Please Select
- *Section: Please Select
- *Exam: Please Select
- Student Type: Please Select
- Course Type: Please Select

The screenshot shows the 'Employee PaySlip' interface. At the top, there is a breadcrumb trail: Academic > Examination > E- Learning > Payroll > Establishment > Administration > Obe. On the left, a sidebar lists 'Reports' with sub-items: 'Employee PaySlip'. The main area is titled 'Employee PaySlip' and contains a form with the following fields:

- *Month / Year: Please Select
- College: R C Patel Institute Of Technology

Figure 9.10.1: Mastersoft Enterprise Resource Planning (ERP) Modules

- **Academic Support Module:** The Academic Support Module strengthens the teaching–learning process and supports OBE implementation. It includes curriculum and course management, lesson planning, timetable allocation, faculty workload management, internal assessment tracking, CO-PO-PSO mapping, and attainment calculation. The module enables data-driven academic planning and continuous improvement.
- **Finance Module:** The Finance Module ensures transparent and efficient financial management through student fee collection, online payment integration, scholarship accounting, budget monitoring, payroll management, and audit-ready reports. It supports effective resource planning and utilization.
- **Examination System Module:** The Examination Module manages the complete examination lifecycle, including exam scheduling, hall tickets, marks entry, result processing, grade generation, revaluation, and performance analysis. Examination assessments are mapped to course outcomes, supporting outcome attainment analysis.
- **Reporting and Governance:** The ERP generates real-time dashboards and reports on student performance, outcome attainment, faculty workload, financial utilization, and feedback analysis, supporting evidence-based decision making.

The ERP system has significantly enhanced academic efficiency, student support services, financial transparency, and examination integrity. It serves as a strong digital backbone for continuous quality improvement in alignment with the OBE framework.

Tally Prime 2.1 ERP (TSS Gold)

The institute has implemented the Tally ERP Accounting and Finance Module to ensure efficient financial management, transparency, and compliance with statutory and accreditation requirements as part of its institutional ERP system.

- Automates accounting and financial processes, reducing manual errors and improving accuracy.
- Supports real-time financial data generation for informed managerial decision-making.
- Used by the Accounts and Finance Section for student fee collection, payroll processing, and expenditure management.
- Enables head-wise fee recording, transparent tracking, and easy reconciliation of accounts.
- Automates salary processing for teaching and non-teaching staff, including statutory deductions (PF, PT, and Income Tax).
- Maintains accurate ledgers, vouchers, and statutory records in compliance with government and audit norms.
- Generates audit-ready reports such as trial balance, income and expenditure statements, balance sheet, and fund utilization reports.
- Improves financial transparency, reduces paperwork, and enables faster report generation.
- Integrated with admission and payroll systems for seamless data flow and effective financial monitoring.

The institute has implemented a comprehensive e-governance framework to enhance efficiency, transparency, and effectiveness in academic, administrative, and support services through the use of digital platforms and ICT tools.

E-Governance in Academic and Administrative Processes

- Mastersoft ERP and Eduplus ERP manage admissions, academics, examinations, finance, HR, and payroll.
- Supports online admission, examination processing, faculty workload, and financial operations.

Learning Management and Academic Delivery

- Moodle LMS is used for course content delivery, assessments, and outcome-based learning.
- Enables blended learning with anytime access for students and faculty.

Digital Communication and Collaboration

- Microsoft 365 provides official email, virtual classrooms, and cloud-based collaboration.
- Promotes paperless communication and efficient documentation.

Library Automation and Knowledge Resources

- Koha ILMs automates library operations including circulation, cataloguing, and OPAC.
- Enhances digital access and effective utilization of library resources.

Attendance, Time, and Payroll Management

- Timelabs biometric system monitors attendance and integrates with HR and payroll.

- Ensures accurate tracking of working hours and leave records.

Admissions and Student Relationship Management

- Meritto (Education CRM) manages student enquiries, counselling, and admission analytics.
- Improves transparency, data-driven decisions, and stakeholder engagement.

Campus-Wide Computing Resources and Accessibility

- Campus-wide LAN, Wi-Fi, and department-wise computer labs are provided.
- Ensures secure and seamless access to ERP, LMS, and digital services.

9.11 Initiatives and Implementation of Sustainable Development Goals (SDGs) (10)

Total Marks 10.00

R. C. Patel Institute of Technology, Shirpur has adopted a clear and structured institutional policy to promote sustainable development in alignment with the United Nations Sustainable Development Goals (SDGs). The policy emphasizes clean and renewable energy adoption, conservation of natural resources, waste reduction, water preservation, carbon footprint mitigation, social inclusion, health, gender equality, and quality education. Sustainability principles are integrated into institutional planning, infrastructure development, academic delivery, and community outreach activities through NSS and other societal engagement programs. The institute ensures periodic review, governance oversight, and continuous improvement of SDG-related initiatives in line with national priorities and regulatory frameworks.

The sustainability policy is implemented through a comprehensive approach that integrates campus-based initiatives, academic activities, and community-oriented programs. At the infrastructure level, the institute has installed a 320 kW rooftop solar photovoltaic power plant to promote clean energy usage, supported by BEE star-rated equipment, LED lighting systems, and energy-efficient electrical infrastructure. Water conservation measures include rainwater harvesting systems, while waste management is addressed through bio-composting, responsible disposal practices, plastic-free campus drives, and paperless digital operations. In parallel, the institute actively implements SDGs through structured outreach and extension programs coordinated under NSS, including tree plantation drives, Swachh Bharat Abhiyan cleanliness campaigns, water conservation activities, plastic-free environment awareness programs, village adoption initiatives, and Unnat Bharat Abhiyan activities.

Health and social well-being are promoted through blood donation camps, health check-up camps, yoga and fitness awareness programs, eye donation campaigns, and public health awareness initiatives such as Nasha Mukti Bharat Abhiyan. Programs focusing on education, democratic values, and social empowerment include literacy and education awareness drives, voter awareness programs, Constitution Day and National Unity Day celebrations, and self-defense training programs for girls. Sustainability is further integrated into academics through SDG-mapped student projects addressing renewable energy, smart agriculture, environmental monitoring, waste management, and smart city applications, thereby strengthening the linkage between academic learning and societal needs.

The implementation of SDG initiatives is supported by documented and verifiable evidence, including Energy, Environmental, and Green Audit reports conducted by certified external agencies. Institutional records such as audit reports, infrastructure documentation, NSS activity reports, photographs, beneficiary data, and academic records of SDG-aligned projects provide adequate evidence of effective implementation. These mechanisms ensure transparency, accountability, and continuous monitoring of sustainability initiatives.

As a result of systematic policy implementation, inclusive outreach, and continuous monitoring, the institute has achieved measurable and sustainable outcomes aligned with multiple SDGs. These outcomes include reduction in carbon footprint and dependence on conventional energy sources, improved water and waste management practices, enhanced environmental quality of the campus, and increased awareness of sustainability among students and the surrounding community. Community outreach programs have benefitted a large number of citizens through initiatives related to health, education, environmental protection, and social empowerment, thereby reflecting the institute's sustained efforts toward institutionalizing sustainable development practices.

- SDG 1 – No Poverty: Community outreach and village adoption programs under NSS and Unnat Bharat Abhiyan support socio-economic awareness and inclusive development.
- SDG 3 – Good Health and Well-Being: Blood donation camps, health check-up camps, yoga and fitness programs, eye donation campaigns, and Nasha Mukti Bharat Abhiyan promote physical and mental well-being.
- SDG 4 – Quality Education: Literacy drives, education awareness programs, voter education initiatives, and SDG-mapped student projects strengthen learning outcomes and social responsibility.
- SDG 5 – Gender Equality: Self-defense training programs and awareness initiatives empower girl students and promote gender equity.
- SDG 6 – Clean Water and Sanitation: Rainwater harvesting systems, water conservation drives, and Swachh Bharat Abhiyan cleanliness campaigns support sustainable water management.
- SDG 7 – Affordable and Clean Energy: Installation of a 320 kW rooftop solar photovoltaic plant, LED lighting, and BEE star-rated equipment reduce carbon footprint and energy consumption.
- SDG 11 – Sustainable Cities and Communities: Village adoption, cleanliness drives, Unnat Bharat Abhiyan activities, and smart city-oriented student projects contribute to sustainable community development.
- SDG 12 – Responsible Consumption and Production: Bio-composting, plastic-free campus initiatives, responsible waste disposal, and paperless digital operations promote sustainable resource use.
- SDG 13 – Climate Action: Tree plantation drives, environmental monitoring activities, and awareness programs contribute to climate resilience and environmental protection.
- SDG 16 – Peace, Justice and Strong Institutions: Constitution Day and National Unity Day celebrations and voter awareness programs promote democratic values and responsible citizenship.
- SDG 17 – Partnerships for the Goals: NSS activities, Unnat Bharat Abhiyan initiatives, health and sanitation drives, village adoption programs, and selected technical workshops conducted with external stakeholders promote collaborative engagement, shared responsibility, and effective implementation of community-oriented and sustainability initiatives.

Sustainability initiatives are effectively integrated with Outcome-Based Education (OBE) through SDG-aligned student projects focusing on areas such as renewable energy, smart agriculture, waste management, and environmental monitoring. These projects enable students to apply theoretical knowledge to real-world sustainability challenges, thereby enhancing learning outcomes and societal relevance. The implementation and impact of these initiatives are systematically assessed through Energy, Environmental, and Green Audits conducted by certified agencies, along with supporting evidence such as NSS activity reports, photographs, beneficiary data, and academic records, ensuring transparency and accountability. As a result, the institute has achieved measurable outcomes including a reduction in carbon footprint, improved water and waste management practices, enhanced environmental quality of the campus, and increased sustainability awareness among students and the surrounding community.

Table 9.11.1: SDG-Based Institutional Initiatives and PO Attainment

Sr. No.	Activity / Project	SDG(s)	PO Mapped	Description / Implementation Details	Application Area / Domain	Learning Outcome / Impact
1	Grid-Connected Solar PV Plant	SDG 7	PO6, PO7	320 kW rooftop solar PV plant under net-metering with MSEDCL	Renewable Energy	Clean energy adoption and sustainability awareness
2	CO ₂ Emission Reduction	SDG 13	PO6, PO7	Carbon emission reduction through renewable energy usage	Climate Action	Understanding of carbon footprint mitigation
3	Rainwater Harvesting System	SDG 6	PO6, PO7	Rooftop rainwater collection and reuse system	Water Conservation	Sustainable water management awareness
4	Solid & E-Waste Management	SDG 12	PO6, PO7	Waste segregation, composting, and authorized e-waste disposal	Waste Management	Responsible consumption practices
5	Tree Plantation Drives	SDG 13, 15	PO6, PO7	Tree plantation through NSS and institutional drives	Environment	Ecological and environmental awareness
6	Swachh Bharat Cleanliness Drives	SDG 11,SDG 17	PO6, PO7	Cleanliness drives on campus and in nearby communities	Public Health	Civic responsibility and hygiene awareness
7	Blood Donation Camp	SDG 3, SDG 17	PO6, PO8	Voluntary blood donation for healthcare support	Healthcare	Social responsibility and communication skills
8	Health Check-up Camp	SDG 3, SDG 17	PO6	Free health screening and medical consultation	Public Health	Preventive healthcare awareness
9	Village Adoption Program	SDG 1, 11, SDG 17	PO6, PO9	Community development and awareness activities	Rural Development	Teamwork and societal engagement
10	Literacy & Education Awareness	SDG 4	PO6, PO8	Literacy drives and educational awareness programs	Education	Communication and social outreach skills
11	Voters' Awareness Program	SDG 16	PO6, PO8	Electoral awareness and democratic participation	Governance	Civic awareness and communication
12	Self-Defense Training for Girls	SDG 5	PO6, PO9	Skill-based safety and empowerment training	Gender Equality	Confidence building and teamwork
13	Special NSS Residential Camp (Karvand)	SDG 3, 4, 11, 17	PO6, PO9, PO10	7-day rural service and development camp	Community Service	Ethical responsibility and teamwork
14	Unnat Bharat Abhiyan – Plastic-Free Drive	SDG 12, 13, SDG 17	PO6, PO7	Community awareness on plastic reduction	Sustainability	Environmental responsibility
15	Smart Agriculture Monitoring System	SDG 2, 12, 13	PO1, PO2, PO3, PO5	Climate-based irrigation monitoring	Agriculture / IoT	Decision-making algorithms
16	All-in-One STEM Box	SDG 4, 9	PO1, PO2, PO3, PO5	Integrated electronics learning kit for school students	Education / STEM	Hands-on electronics and programming
17	Suitcase Electric Vehicle for Physically Disabled	SDG 3, SDG 11, SDG 9, SDG 10	PO1–PO12, PSO2, PSO3	Portable suitcase-type electric vehicle designed to support mobility of physically disabled persons.	Electric Vehicle / Assistive Mobility	Improved accessibility and awareness of sustainable EV-based mobility solutions
18	Portable Electric Scooter	SDG 7, SDG 9, SDG 13	PO1–PO12, PSO1, PSO3	Compact portable electric scooter designed for eco-friendly short-distance transportation.	Electric Vehicle / Green Mobility	Promotes clean energy transportation and awareness of sustainable mobility solutions
19	CureConnect-Enterprise Edition	SDG 3	PO1 to PO12	Healthcare management platform designed to connect hospitals, doctors, patients	Healthcare Information Systems	Students understand enterprise web application development, system design
20	COLLAX: Online, Coding, Interview, Platform	SDG 4	PO1 to PO12	Design system to conduct online technical interviews	Smart interview Platform	Conduct interviews seamlessly
21	Ganapati Visarjan Nirmalya Cleaning Problem at River	SDG 6 SDG 14	PO1–PO12, PSO1, PSO2	Design and fabrication of a Nirmalya collection system to reduce river pollution during Ganapati Visarjan.	Design and Fabrication	Reduces river pollution, improves water quality, protects aquatic life, and promotes eco-friendly festival practices.

Sr. No.	Activity / Project	SDG(s)	PO Mapped	Description / Implementation Details	Application Area / Domain	Learning Outcome / Impact
22	3D Modeling and Drafting of Special Fastener	SDG 9 SDG 12	PO1-PO12 PSO1 PSO2	Design of a customized special fastener using 3D CAD modeling and drafting for specific industrial applications.	Machine Design	Promotes efficient design, reduces material waste, enhances product reliability, and supports sustainable manufacturing.
23	IoT Based Water Network System	SDG 6, SDG 9, SDG 11	PO2, PO3, PO5, PO6, PO7, PO11	Development of an IoT-based water network monitoring system for leakage detection and efficient water management.	Water Resource	Water Management and Conservation
24	Sustainable Materials in Concrete with Partial Replacement of Cement Bagasse Ash	SDG 9, SDG 11, SDG 12:	PO1, PO2, PO4, PO7, PO12	Experimental study on partial replacement of cement with bagasse ash to develop sustainable concrete.	Sustainable Materials	Sustainable Materials
25	Student Feedback System for RCPIT	SDG 4	PO1 to PO12	Faculty feedback is taken from students in transparent way.	Application	Understanding Data Analytics
26	The Smart Car Parking System with IoT	SDG 9, SDG 11	PO1 to PO12	It provides automated solution to manage parking spaces efficiently	IoT	Understand the implementation of IoT-based smart parking systems

Overall, the institute has effectively integrated sustainability initiatives with Outcome-Based Education (OBE) and the Sustainable Development Goals (SDGs) through a wide range of institutional practices, community outreach activities, and SDG-mapped student projects.

These initiatives have enabled students to apply engineering knowledge to real-world societal and environmental challenges, resulting in measurable learning outcomes such as enhanced technical competence, environmental awareness, social responsibility, teamwork, and ethical values. Systematic assessment through certified audits, documented records, and stakeholder feedback ensures transparency, accountability, and continuous improvement. The tangible outcomes—reduced carbon footprint, improved water and waste management, strengthened community engagement, and increased sustainability awareness—clearly demonstrate the institute's commitment to institutionalizing sustainable development practices

R. C. Patel Institute of Technology, Shirpur has implemented innovative, NEP-2020–aligned initiatives to promote student mobility, inclusivity, and flexible learning. The institute has adopted the Academic Bank of Credits (ABC) as per UGC guidelines, enabling seamless credit earning, transfer, and redemption through SWAYAM/NPTEL, MOOCs, inter-institutional electives, and value-added skill courses such as Code Chef. Regular orientation programs and academic collaborations with other Higher Education Institutions further strengthen multiple entry–exit awareness and enrich students’ academic exposure.

Initiatives Taken Towards Mobility of Students

The institute has undertaken several initiatives to promote academic and professional mobility of students in line with NBA and NEP-2020 guidelines. The Choice Based Credit System (CBCS) is implemented, allowing students to select electives across departments and enabling horizontal mobility within the institute. The curriculum provides flexibility for interdisciplinary learning and supports credit equivalence.

In compliance with UGC regulations, the institute has implemented the Academic Bank of Credits (ABC). Students are encouraged to earn credits through SWAYAM/NPTEL MOOCs, which are mapped with curriculum courses and transferred as per institutional policy. This initiative enables students to learn from premier institutions such as IITs, IISc, and central universities, thereby enhancing academic mobility at the national level.

The institute actively facilitates student internships, industrial training, and project work in collaboration with industries, research organizations, and academic institutions. These opportunities allow students to gain exposure to diverse work environments and practical learning experiences beyond the parent institute, thereby promoting professional mobility. Students are also encouraged and financially supported to participate in workshops, conferences, competitions, summer schools, and certification programs conducted by other institutions and professional bodies. Academic leave, mentoring support, and recognition of participation are provided to ensure continuity in learning while encouraging external exposure.

Key Initiatives for Holistic Education and Inclusivity:

- **Holistic and Value-Based Education:** Integration of Universal Human Values, ethics, environmental studies, sustainability, yoga, meditation, and wellness programs to promote professional ethics, social responsibility, and overall well-being.
- **Multidisciplinary & Experiential Learning:** Promotion of multidisciplinary and interdisciplinary learning through open electives across engineering, science, humanities, management, and arts, along with project-based learning, internships, industry-linked problem-solving, seminars, and workshops.
- **Research, Innovation & Indian Knowledge System (IKS):** Strengthening research culture through minor projects, innovation cells, incubation initiatives, and promotion of Indian Knowledge System via guest lectures, curriculum integration, and celebration of Indian heritage and national days.
- **Inclusivity, Equity & Support for Slow Learners:** Implementation of scholarships, fee concessions, reservation policies, counselling, mentoring, and structured remedial measures including diagnostic tests, tutorial sessions, peer mentoring, and continuous academic monitoring.
- **Support for Physically Challenged Students:** Provision of a barrier-free campus with accessible infrastructure, academic accommodations such as extra exam time, scribes, flexible attendance, digital learning resources, and dedicated mentoring and counselling to ensure equal participation and dignity.

Objectives: In alignment with NEP-2020, the institute has adopted a learner-centric approach to foster academic flexibility, holistic development, and inclusive education. These initiatives aim to create an equitable, multidisciplinary, and value-driven learning environment for all students. To enhance student mobility and academic flexibility through the Academic Bank of Credits (ABC) and MOOC-based learning platforms.

- To implement holistic education by integrating human values, ethics, wellness, and sustainability into the curriculum.
- To promote multidisciplinary and interdisciplinary learning across diverse academic domains.
- To create awareness and integrate the Indian Knowledge System (IKS) into teaching–learning practices.
- To ensure equity, inclusivity, and accessibility for economically, socially, and physically challenged students.
- To identify and support slow learners through structured academic monitoring and targeted remedial interventions.

Student Mobility & Academic Bank of Credits (ABC):

- Implementation of Academic Bank of Credits (ABC) as per UGC guidelines
- Credit earning and transfer through SWAYAM/NPTEL, MOOCs, and inter-institutional electives
- Orientation programs on ABC and multiple entry–exit options
- Collaborations with other HEIs for academic mobility and exposure
- Skill-based and value-added courses (e.g., Code Chef, industry certifications)

Holistic Education & Human Values

- Courses on Universal Human Values, ethics, environmental studies, and sustainability
- Yoga, meditation, wellness, and stress-management programs
- Emphasis on professionalism, social responsibility, and leadership skills

Multidisciplinary & Interdisciplinary Curriculum

- Open electives across engineering, science, humanities, management such as Product life cycle management, Personal Finance Management etc and arts such as Constitution of India, Universal Human Value etc.
- Interdisciplinary projects, seminars, workshops, and minor projects
- Project-based learning, internships, and industry-linked problem-solving activities

Indian Knowledge System (IKS)

- Guest lectures on ancient Indian science, mathematics, yoga, Ayurveda, and Vedic knowledge
- Integration of IKS concepts and examples in relevant subjects
- Celebration of Indian festivals, national heritage days, and cultural programs

Inclusivity, Equity & Student Support

- Scholarships, fee concessions, and reservation policies as per government norms
- Mentoring, counselling, and student support services & Awareness programs

Support for Economically, Socially & Physically Challenged Students

- Barrier-free campus with ramps, handrails, wide corridors, accessible classrooms and washrooms
- Lift facilities wherever required
- Academic accommodations including extra examination time, scribes/readers, and flexible attendance
- Access to digital resources, recorded lectures, and soft copies of study materials
- Dedicated faculty mentoring, counselling, and financial assistance

Action Plan for Slow Learners

- Identification through diagnostic tests, continuous internal assessment, and faculty observation
- Remedial classes and tutorial sessions
- Peer mentoring and faculty counselling
- Continuous academic monitoring and performance tracking
- Societal development and national priorities.
- Action plan has been discussed, and its impact has been briefly explained in Criteria 2, Section 2.1 (I).

9.13 Faculty Performance Appraisal and Development System (FPADS) (10)

Total Marks 10.00

R. C. Patel Institute of Technology (RCPIT), Shirpur has established a structured and transparent Faculty Performance Appraisal and Development System (FPADS) to enhance teaching effectiveness, research productivity, professional growth, and institutional contribution. (Refer Figure 9.13.1)

The system ensures continuous faculty development through systematic evaluation, feedback, and targeted improvement initiatives. R. C. Patel Institute of Technology, Shirpur follows a structured self-appraisal system for faculty assessment comprising three categories:

- Teaching, Learning and Evaluation
- Co-curricular, Extension Professional Development
- Research, Publications and Academic Contributions

Faculty members submit the appraisal form with supporting documents at the end of each academic year, which is evaluated by an institute-appointed committee.

A. Performance Appraisal System

The implementation of a self-appraisal system involves the following steps:

Establishing a committee: Committee comprising Governing Body members, Director and the respective Heads of Department (HODs) is constituted to conduct the Faculty Performance Appraisal at the end of each academic year.

Performance Review: The committee reviews the progress and performance of faculty members based on various criteria and indicators. These include teaching effectiveness, research contributions, professional development, and other relevant factors.

Overall Performance Rating: After reviewing the performance, an overall performance rating is assigned to each faculty member. This rating serves as feedback for self-improvement and helps identify areas where faculty members need to focus on enhancing their skills and performance.

Feedback and Recommendations: Faculty members who receive a poor performance rating are provided with specific feedback on areas requiring improvement. The feedback aims to guide them towards self-improvement and professional development.

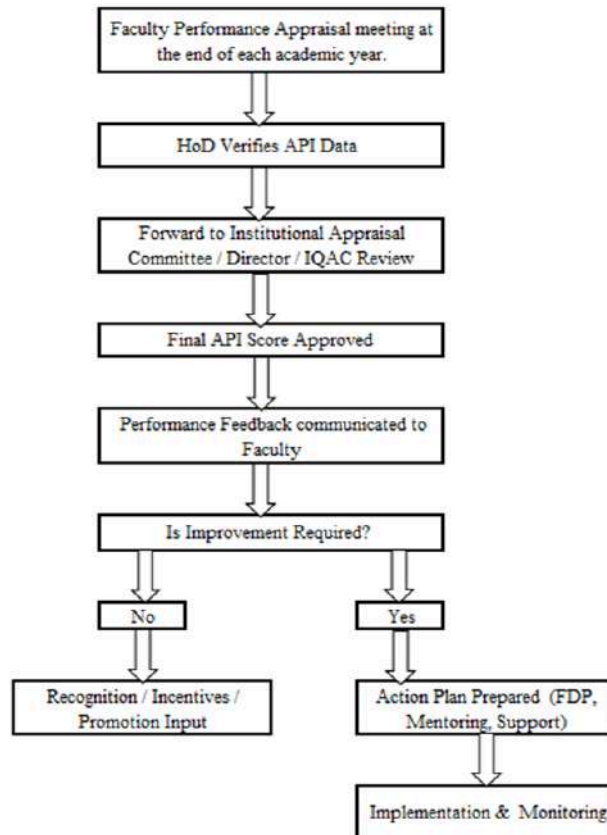


Figure 9.13.1: Faculty Performance Appraisal and Feedback Mechanism

Recognition and Rewards:

Faculty members who receive good performance ratings are rewarded with recognition, such as awards, appreciation letters, and promotions through a career advancement scheme. These rewards serve as incentives and acknowledgements for their dedication and contribution to their roles.

Sample Appraisal Form

The sample API form is a structured self-appraisal tool designed to evaluate faculty performance in teaching-learning, research, professional development, and institutional contributions. It captures quantitative and qualitative details of academic activities along with supporting documents to ensure transparency. The form is verified by the HOD & reviewed by the IQAC Committee and Director. The final API score is used for feedback, performance improvement and career advancement

		The Shirpur Education Society and R C Patel Educational Trust			
Teachers Performance Appraisal Form					
(The format to be used by all institutes for performance appraisal of the teacher)					

1.1A) PERFORMANCE IN ENGAGING LECTURES / PRACTICALS/ TUTORIALS /ADMINISTRATIVE LOAD/ RESEARCH SUPERVISION/PROJECT GUIDANCE (MAXIMUM SCORE: 50 POINTS)

SN (1)	Class /Course (2)	Subject Taught (3)	No. of Hours Targeted (4)	Hrs. Actually Engaged (5)	% Target Achieved (6)	Avg. of Col. (6) (7)	Performance & Multiplying Factor (8)	Max. Weight (9)	API Score Claimed 8*9 (10)	Verified API Score (11)
1		SOM (Theory) SOM (Pract.) (Div-A) EG (Theory) EG (Pract.) (Div- F and I) Research Supervision SEM-I	192	235	100	100	Excellent-1	50	50	50
2		EG (Theory) (Div- A and D) EG (Pract.) (Div- A and E) Research Supervision SEM-II	192	206	100					

1.1B) PERFORMANCE IN ATTENDANCE OF STUDENTS (MAXIMUM SCORE: 20 POINTS)

SN (1)	Class /Course (2)	Subject Taught (3)	Sum of Students Present (4)	Lectures Actually Engaged (5)	Students on Roll (6)	Avg. Attendance = $\frac{(4) \times 100}{(5) \times (6)}$ (7)	Avg. of Col. (7) (8)	Performance & Multiplying Factor (9)	Max. Weight (9)	API Score Claimed 8*9 (10)	Verified API Score (11)
1	SY [A]	SOM	782	24	58	56.178161	75.56071468	Excellent-1	20	20	20
2	FY [F]	EG	2163	39	63	88.034188					
3	FY [I]	EG	2040	38	63	85.213033					
4	FY [A]	EG	1922	46	62	87.391304					
5	FY [D]	EG	2347	46	63	80.986888					
6											
7											
8											
9											
10											

1.1C) PERFORMANCE IN RESULTS: (THEORY SUBJECT) (MAXIMUM SCORE: 20 POINTS)

SN (1)	Class /Course (2)	Subject Taught (3)	% Result of the Same Subject in the University (4)	% Result of the Same Subject in the Institute (5)	Column (5/4)*100 (6)	Avg. of Col. (6) (7)	Performance & Multiplying Factor (9)	Max. Weight (9)	API Score Claimed 8*9 (10)	Verified API Score (11)
1	SY [A]	SOM	45	45	100.00	100.00	Excellent-1	20	20	20
2	FY [F]	EG	90	90	100.00					
3	FY [I]	EG	86	86	100.00					
4										
5										
6										
7										
8										
9										
10										

1.2) LECTURES AND ACADEMIC DUTIES IN EXCESS OF UGC NORMS (MAXIMUM SCORE: 10POINTS)

SN (1)	Type of Activity (2)	No. of Students Benefited (3)	No. of Hours Engaged for the Activity (4)	API Score Claimed (Sum of Col. (4) /30)*2 (5)	Verified API Score (11)
1	Remedial Coaching SOM	20	6	10	10
2	Career Counseling Admission	57	72		
3	Competitive Exam Preparation				
4	General Counseling	240	48		
5	Soft Skill Development of the Student				
6	Extra Teaching Load		57		
7	LG Monitoring	13	48		
8	Add on Courses				
9	Any other Approved by Principal: SC ST Cell NSS	107	24		

Note:- Records to be maintained

1.3) PREPARATION OF STUDY MATERIAL AND RESOURCES (MAXIMUM SCORE: 20 POINTS)

SN	Study Material/ Resources	API Score Claimed	Verified API Score
1	Updated Lecture Notes (SOM, EG)	10	10
2	Lab Manuals (SOM, EG)	8	8
3	List of E Resource (SOM, EG)	2	2
4	Question Paper Solution (SOM, EG)	10	10
5	Any other Approved by Principal Blue Print for EG	5	5
TOTAL		20	20

1.4) INNOVATIVE TEACHING LEARNING METHODS (MAXIMUM SCORE: 20 POINTS)

SN	Study Material/ Resources	API Score Claimed	Verified API Score
1	Teacher Diary	10	10
2	To Prepare and use ICT based Teaching Material	5	5
3	Model/ GD / Case Study (Points=5 for each case)	10	10
4	Any other Approved by Principal		
TOTAL		20	20

1.5) STUDENT'S FEEDBACK (MAXIMUM SCORE: 15 POINTS)

SN	Class	No. of students involved in feedback	Feedback frequency per course	Methodology	API Score Claimed	API Score Verified
1	SY_A	50	1	Online feedback	15	15
2				Manual paper feedback		
3	FY	48	1	Online feedback	15	15
4				Manual paper feedback		
TOTAL					15	15

1.6) EXAMINATION RELATED WORK (MAXIMUM SCORE: 25 POINTS):

SN	Type of Examination Work	API Score Claimed	Verified API Score
1	Conduction of Test, Tutorials, Term work and their Evaluation and Maintaining Proper Records	10	10
2	Examination Work Assigned by University	5	5
3	Examination Work Assigned by Institute	10	10
TOTAL		25	25

CATEGORY-1**TOTAL API SCORE CLAIMED****180****TOTAL API SCORE VERIFIED****180**

CATEGORY 2: CO-CURRICULAR, EXTENSION AND PROFESSIONAL DEVELOPMENT RELATED ACTIVITIES
(MAXIMUM SCORE: 70)

2.1) STUDENT RELATED CO-CURRICULAR, EXTENSION AND FIELD BASED ACTIVITIES (MAXIMUM SCORE: 30 POINTS)

SN	Name of Activity	API Score Allotted	API Score Claimed	Verified API Score
1	NSS/NCC Chief Program Officer	10	8	8
2	Other Program Officer	8		
3	Student Welfare Officer	5		
4	NET/SET Workshop Conduct(1 Week)	5		
5	Cultural Activities (Departmental/Institutional)	5	5	5
6	Lectures on Special Topics	5		
7	Presentations / Debate/ Elocution (Points=5 for each case)	5	5	5
8	Study Tour	5		
9	Avishkar (Student Guidance)	5		
10	Essay Competition	5		
11	Project Exhibition	5	5	5
12	Science Day Celebrations	5	3	3
13	Subject Association	5	5	5
14	Any other Activity Approved by Principal (Equal Opportunity Cell)	5	5	5
15	Any other Activity Approved by Principal (SES Examiner)	5	5	5
16	Any other Activity Approved by Principal (Food Inspection)	5	5	5
17	Any other Activity Approved by Principal (SC ST Cell)	5	5	5
18		5		
19		5		
20		5		
21		5		
TOTAL			30	30

2.2) CONTRIBUTION TO CORPORATE LIFE AND COMMUNITY WORK (MAXIMUM SCORE: 25 POINTS)

2.2A) COMMUNITY WORK (MAXIMUM SCORE: 5 POINTS)

SN	Name of Activity	API Score Allotted	API Score Claimed	Verified API Score
1	Blood Donation+ Small Family+ Yoga Day+ Club Samarpan + Tande Sports+ Clus Saksbam	5	5	5
TOTAL of 2.2A			5	5

2.2B) ADMINISTRATIVE AND ACADEMIC (MAXIMUM SCORE: 20 POINTS)

SN	Name of Activity	API Score Allotted	API Score Claimed	Verified API Score
1	Head /Dean/Reclor	5		
2	Vice Principal	10		
3	Admission Committees (First Year,D2D and Departmental)	5	3	3
4	Converges-2023 (Dept. Co-ordinator)	5	5	5
5	Statutory Committees of the University	5		
6	Placement Activity	5	3	3
7	Academic Committee* (Class Teacher, Local Guardian, Time Table, Examination Competitive Exam Committee such as NET/SET/GATE etc) (Points=5 for each case).	5	5	5
8	NBA Committee	5	5	5
9	Happiness Matrix Scheme (Co-ordinator)	5	5	5

10	Ansys Training for Faculty Members (Co-ordinator)	5	5	5
11	BoS Committee (Co-ordinator)	5	5	5
TOTAL of 2.2B			20	20
TOTAL of 2.2(2.2A & 2.2B)			25	25

2.3) PROFESSIONAL DEVELOPMENT ACTIVITIES (MAXIMUM SCORE: 15 POINTS)

SN	Name of Activity	API Score Allotted	API Score Claimed	Verified API Score
1	Participation in Seminar / Symposia / Conference ICRAMM-2022, ERP NBA NEP OBE IPR in RCPIT (Active Participation: 2 Points, Attended: 1 Points)	10	10	10
2	Convener/Organizing Secretary/ Chairman/ Member of professional Body (IAENG Membership) (Points=5 for each case)	5	5	5
3	Talks Delivered in Program Outside (at V N Naik, Shahada)	5	5	5
4	General Article Publication/ Editor of the conference proceeding /Reviewer of journal (Reviewer) (Points=5 for each case)	5	5	5
TOTAL			15	15

CATEGORY-2	
TOTAL API SCORE CLAIMED	70
TOTAL API SCORE VERIFIED	70

CATEGORY-1 + CATEGORY-2	
TOTAL API SCORE CLAIMED	250
TOTAL API SCORE VERIFIED	250

CATEGORY 3: RESEARCH, PUBLICATIONS AND ACADEMIC CONTRIBUTION
**** (Refer Manual for the Marks)**

3.1) PUBLISHED PAPER IN JOURNAL (JOURNAL+CONFERENCE PROCEEDINGS =MAXIMUM 30 POINTS)

SN	Title with Page No.	Journal	ISSN/ISBN No.	Peer Reviewed	Impact Factor	No. of Co-Authors	Whether you are the main author?	API Score Claimed	Verified API Score
1	PEEKICIZONSCATB	Materials Today, Elsevier	22147853	YES	3.2	2	YES	12	12
2								0	
3								0	
4								0	
5								0	
6								0	
7								0	
8								0	
9								0	
10								0	
TOTAL								18	18

3.2) ARTICLES/ CHAPTERS PUBLISHED IN BOOKS AND CONFERENCE PROCEEDINGS (MAXIMUM 25 POINTS)

3.2.1A) PUBLISHED BOOKS

SN	Title of book	Name of Publisher	National / International or Other	ISSN/ ISBN No.	No. of Co-Authors	Whether you are the main author	API Score Claimed	Verified API Score
1								
2								
3								0
TOTAL of 3.2.1.A							0	0

3.2.1B) ARTICLES/CHAPTERS PUBLISHED IN BOOKS

SN	Title of book	Name of Publisher	National / International or Other	ISSN/ ISBN No.	No. of Chapters	API Score Claimed	Verified API Score
1						0	
2						0	
TOTAL of 3.2.1.B						0	0
TOTAL of 3.2.1						0	0

3.2.2A) PAPERS IN CONFERENCE PROCEEDINGS									
SN	Title with Page no.	National/ International or Other	Details of Conference Publication	Full Paper or Abstract	ISSN/ ISBN No.	No. of Co-Authors	Whether you are main author?	API Score Claimed	Verified API Score
1	PEEKCIZONSCATB	YES	ICRAMM-2022	YES	22147853	2	YES	3	3
2								0	
3								0	
4								0	
5								0	
6								0	
7								0	
8								0	
9								0	
10								0	
TOTAL of 3.2.2.A								3	3

3.2.2B) AVISHKAR/ANY OTHER								
SN	Title of Paper/Poster/Model	Avishkar	Prize Won	No. of Co-Authors	Whether you are main author?	API Score Claimed	Verified API Score	
1	Avishkar 2022	YES	NO	0	YES	3	3	
2						0		
3						0		
4						0		
TOTAL of 3.2.2.B						3	3	
TOTAL of 3.2.2 (This total will be added in 3.1 as a research publication)						6	6	

3.3) ONGOING AND COMPLETED RESEARCH PROJECTS AND CONSULTANCIES (MAXIMUM 20 POINTS)									
SN	Title	Agency	Period	Type of Project	Grant/Amount Mobilized (Rs. Lakh)	Are You Principal Investigator?	No. of Co-Invest.	API Score Claimed	Verified API Score
1								0	
2								0	
3								0	
4								0	
5								0	
TOTAL								0	0

3.4) RESEARCH GUIDANCE /QUALIFICATION (MAXIMUM 20 POINTS)

3.4A) RESEARCH GUIDANCE (MAXIMUM 10 POINTS)						
SN	Research Guidance	Number Enrolled	Thesis Submitted	Degree Awarded	API Score Claimed	Verified API Score
1	M. Phil /ME/ M Pharm				0	
2	MCA/M.ed/MSC				0	
3	Ph.D. or Equivalent				0	
TOTAL of 3.4A					0	0

3.4B) RESEARCH QUALIFICATION (MAXIMUM 10POINTS)					
SN	Qualification	Submitted	Awarded	API Score Claimed	API Score Claimed
1	Ph.D.	YES	YES	10	10
2	ME/M.Phil/M pharm			0	
TOTAL of 3.4B				10	10
TOTAL of 3.4				10	10

3.5) PATENT/ IPR (MAXIMUM 15 POINTS)						
SN	Title	REG. NO.	Submitted	Granted	API Score Claimed	Verified API Score
1	SPFSAAENCOCFR	L-124775/2023	YES	No	10	10
2					0	
TOTAL					10	10

3.6) TECHNICAL WORKSHOPS / SOFT SKILL DEVELOPMENT WORKSHOPS PARTICIPATION (MAXIMUM 15 POINTS)					
SN	Programme	Duration (Mention in Days)	Organized By	API Score Claimed	Verified API Score
1	Electric Power Systems	4 Week	Coursera	15	15
2	Energy The Enterprise	4 Week	Coursera	15	15
3	Recent Trends In Advanced Manufacturing Technology	1 Week	D Y Patil College of Engineering, Akurdi, Pune	15	10
TOTAL				15	15

CATEGORY-3	
TOTAL API SCORE CLAIMED	53
TOTAL API SCORE VERIFIED	53

IV. SUMMARY OF API SCORES					
Category	Criteria	API for Assessment Year	API Score Claimed	Verified API Score	Diff. in %
I	Teaching , Learning and Evaluation Related Activities		180	180	0
II	Co-curricular, Extension, Professional Development etc		70	70	0
	Total I+II		250	250	0
III	Research and Academic Contribution		53	53	0
IV	Others*				

Grade on the Basis of API Score Claimed	
API Category I+II+III	Grade
303	O (Outstanding)

Grade on the Basis of API Score Verified	
API Category I+II+III	Grade
303	O (Outstanding)

Mention Year of Experience in this Institute	9
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UNDERTAKING

I **Dr. Nitin Girdhar Shinde** undertake that the information provided is correct as per records submitted by me to College/ Institute and /or documents enclosed along with the duly filled API Proforma.

Date Signature of the Teacher with Designation

****Note:** The special API Score of maximum of 5 each may be awarded by principal for the following activities for reward category only. This score shall be added to the score total secured in category I +II.

- Extra ordinary contribution beyond institution (Please mention activities for which special weight is given)
- Overall impression of the teacher (Like attitude, Integrity, Self discipline, Loyalty Towards Institute etc).

API GRADES TABLE AND ASSESSMENT SUMMARY

Grade shall be given according to API score as shown below.

API Category I+II+III	Grade	
≥300	O	Outstanding
275-299	A+	Excellent
250-274	A	Very Good
225-249	B+	Positively Good
200-224	B	Good
180-199	C+	Satisfactory
160-179	C	Improvement Required
<160	NotAcceptable	NotAcceptable

REMARK OF THE ASSESSMENT OFFICER:

Assessment Grade:	O (Outstanding)
-------------------	-----------------

Place

Date

Assessment officer Sign and Designation
(Chairman IQAC / HOD)

Figure 9.13.2 : Sample Academic Performance Indicator (API) Form

B. Implementation & Impact of faculty Appraisal system

The implementation of the Academic Performance Indicator (API) system at Institute has resulted in significant improvement in overall faculty performance and institutional quality as shown in Table 9.13.A.

Table 9.13.A: Academic Year-wise Percentage Distribution of Faculty Performance Grades

Year/ Grade	O	A+	A	B+	B	C+	C	D
24-25	14.29	57.14	25.00	2.68	0.00	0.00	0.00	0.89
23-24	16.67	53.70	28.70	0.93	0.00	0.00	0.00	0.00
22-23	4.12	54.64	41.24	0.00	0.00	0.00	0.00	0.00
21-22	3.70	30.86	60.49	4.94	0.00	0.00	0.00	0.00
20-21	2.27	56.82	32.95	7.95	0.00	0.00	0.00	0.00
19-20	2.00	33.00	43.00	20.00	2.00	0.00	0.00	0.00
18-19	4.50	36.04	45.05	10.81	2.70	0.00	0.90	0.00
17-18	3.60	36.04	44.14	11.71	1.80	2.70	0.00	0.00
16-17	0.83	26.67	38.33	25.83	6.67	1.67	0.00	0.00
15-16	0.00	15.00	24.17	55.00	5.00	0.00	0.00	0.83
14-15	0.83	3.31	23.97	54.55	17.36	0.00	0.00	0.00
13-14	0.00	4.62	3.08	6.15	20.00	49.23	16.92	0.00

Table 9.13.B: API Assessment Scaling (Faculty Performance Evaluation)

Grade	Award & Reward	Recognition	Counselling	Advisory Note / Action Plan
O (Outstanding)	Special incentive Best Faculty Award	Certificate of Excellence	Not Required	<ul style="list-style-type: none"> Encourage leadership roles Nominate for external awards, FDPs, funded projects
A+ (Excellent)	Performance-based incentive	Certificate of Appreciation	Not Required	<ul style="list-style-type: none"> Encourage mentoring of junior faculty Support for research & innovation
A (Very Good)	Merit Certificate	Department-level appreciation	Optional (if needed)	<ul style="list-style-type: none"> Encourage improvement in research / pedagogy Recommend FDP participation
B+ (Positively Good)	No monetary reward	Appreciation letter	If required	<ul style="list-style-type: none"> Identify gaps Suggest skill up gradation & training programs
B (Good)	Not Applicable	Not Applicable	Mandatory	<ul style="list-style-type: none"> Issue advisory note Improvement plan with timelines

Grade	Award & Reward	Recognition	Counselling	Advisory Note / Action Plan
C+ (Satisfactory)	Not Applicable	Not Applicable	Mandatory	<ul style="list-style-type: none"> Formal counselling by HoD/Director Short-term improvement targets
C (Poor)	Not Applicable	Not Applicable	Mandatory (Intensive)	<ul style="list-style-type: none"> Written warning Monitoring for next appraisal cycle
D (Very Poor)	Not Applicable	Not Applicable	Mandatory (Critical)	<ul style="list-style-type: none"> Strict advisory / show-cause Corrective action as per service rules

Over the years, there is a clear shift of faculty ratings towards higher performance bands (A and A+), indicating enhanced teaching effectiveness, increased research output, and greater professional engagement.

- Significant increase in the number of faculty members attaining A+ and A grades, indicating improved teaching and research performance.
- Enhanced quality of teaching–learning processes through systematic feedback, mentoring, and adoption of innovative pedagogies.
- Improved research output, including publications, projects, FDP participation, and professional contributions.
- Increased faculty motivation and engagement due to transparent evaluation, recognition, and career advancement opportunities.
- Identification and support of faculty requiring improvement through targeted action plans, FDPs, and mentoring.
- Overall continuous improvement in academic excellence and institutional performance.
- **Self-Reflection and Growth:** The self-appraisal system encourages faculty members to reflect on their own performance and identify areas for improvement. This self-reflection fosters personal growth and enables faculty members to take ownership of their professional development.
- **Motivation and Engagement:** The feedback received through the self-appraisal system can motivate faculty members to excel in their roles. The recognition and rewards for good performance further enhance motivation and engagement.
- **Targeted Development:** By providing specific feedback, faculty members are able to focus on areas requiring improvement. This targeted approach to professional development enables them to enhance their skills and competencies in a more effective manner.
- **Fair and Objective Evaluation:** The self-appraisal system, combined with the committees review, ensures a fair and objective evaluation of faculty performance. The involvement of multiple stakeholders helps minimize biases and ensures a comprehensive assessment.
- **Performance Enhancement:** The feedback and recommendations provided through the self-appraisal system enable faculty members to identify and address their weaknesses. This, in turn, leads to continuous performance enhancement and contributes to the overall improvement of teaching and research quality
- **Retention and Career Advancement:** The self-appraisal system, coupled with promotions through a career advancement scheme, provides faculty members with opportunities for growth and advancement within the organization. This can contribute to increased job satisfaction and retention.

RCPIT undertakes a wide range of outreach activities aimed at community development, social awareness, and experiential learning. Under initiatives such as Unnat Bharat Abhiyan (UBA), students adopt nearby villages and work closely with local communities to identify and address issues related to sanitation, water conservation, renewable energy, education, and digital literacy. These activities help students develop problem-solving skills while contributing to rural development.

A. Initiatives

The institute also promotes community service and social internships, where students participate in health awareness programs, blood donation camps, environmental conservation drives, and Swachh Bharat initiatives. Through society connect activities, students collaborate with NGOs, local bodies, and government agencies to conduct technical awareness programs, skill development workshops, and sustainability-oriented projects. These outreach efforts have resulted in improved social awareness among students, enhanced leadership and teamwork skills, and a strong sense of civic responsibility, while creating a positive impact on the surrounding community.

Student Development through Clubs: Student clubs and professional society chapters offer structured experiential learning beyond the classroom, complementing the curriculum and supporting Outcome-Based Education (OBE) and attainment of POs and PSOs.

Clubs and chapters such as Akatsuki Coding Club, GDGoC, Glitchverse Gaming Tech Club, Unstop Igniters Club, Aakritix, RCPIT Motorsport Club, Fetch.AI, Energy Club, Communicado, Data Polaris, Commexus, ACM Student Chapter, NSS, E-Builder, RoboTEMB Club, CESA, RCPIT-Wings, and other institute-level forums promote hands-on learning, technical skill development, innovation, leadership, teamwork, professional communication, and social responsibility. Through workshops, competitions, projects, hackathons, and community-oriented activities, students gain practical exposure, ethical values, and lifelong learning skills, thereby strengthening OBE and effective PO attainment.

To enhance holistic student development through club activities aligned with Outcome-Based Education (OBE).

- Improves technical knowledge, problem-solving, innovation, and modern tool usage (PO1–PO3, PO5).
- Develops teamwork, leadership, communication, and project management skills (PO7–PO9).
- Instills ethics, social responsibility, and community engagement (PO6, PO10).
- Encourages lifelong learning and overall attainment of POs & PSOs (PO11, PO12).

The institution promotes Outcome-Based Education (OBE) by encouraging student participation in outreach and society-connect activities, fostering societal development along with professional and ethical competencies. Some of the outreach activities undertaken are as follows:

Table 9.14.1: SDG-Mapped NSS Outreach and Extension sample Activities

Sr. No	Name & Details of Activity	Organized By	A.Y.	Date/ Duration	Relevant SDG(s)
1	Tree Plantation Drives	NSS	24-25	09/12/2024	SDG 13, SDG 15
2	Swachh Bharat Abhiyan (Cleanliness Drives)	NSS	24-25	17/09/2024	SDG 3, SDG 6, SDG 11
3	Blood Donation Camps	NSS	24-25	14/09/2024	SDG 3
4	Health Check-up Camps	NSS	24-25	03/04/2025	SDG 3
5	Water Conservation Activities	NSS	24-25	03/11/2024	SDG 6
6	Village Adoption Programs	NSS	24-25	03/07/2024	SDG 1, SDG 11
7	Literacy & Education Awareness Programs	NSS	24-25	03/11/2025	SDG 4
8	National Voters' Awareness Programs	NSS	24-25	17/09/2024	SDG 16
9	Yoga & Fitness Awareness Camps	NSS	24-25	21/06/2025	SDG 3

Sr. No	Name & Details of Activity	Organized By	A.Y.	Date/ Duration	Relevant SDG(s)
10	Constitution Day	NSS	24-25	26/11/2024	SDG 16
11	National Unity Day Activities	NSS	24-25	31/10/2025	SDG 16
12	Special NSS Camps (7-Day Residential Camps) – Karvand village	NSS	24-25	07/03/2025 To 13/03/2025	SDG 3, SDG 4, SDG 11, SDG 17
13	Plastic-Free Campus Campaigns (Swachhata Abhiyan Rally)-Shivpuran place- Kravand	NSS	24-25	12-09-2024	SDG 3, SDG 6, SDG 11
14	Public Health Awareness Campaigns (Nasha Mukti Bharat abhiyan program pledge program and rally)	NSS	24-25	12/8/2024 To 15/08/2024	SDG 3
15	Eye Donation companion "Netradan"	NSS	24-25	25/02/2025	SDG 3
16	Self Defense Training for the girls	NSS	24-25	10/10/2024	SDG 5
17	Literacy & Education Awareness Programs	NSS	24-25	15/10/2024	SDG 4
18	Digital Poster Making	Fetch.ai	25-26	11/09/2025	SDG 12, SDG 13
19	GlitchVerse Gaming Tech Club Inaugration and Expert Session	GlitchVerse Gaming Tech Club	25-26	6/10/2025	SDG 4, SDG 9, SDG 17
20	Workshop by GDGoC Think in C	Google Developer Groups on Campus	25-26	07/10/2025	SDG 4, SDG 9
21	Sustainable Energy Solutions Hackathon 23	Energy Club	23-24	2/11/2023	SDG 7, SDG 9, SDG 11, SDG 12, SDG 13
22	Poster Making Competition on Energy Sustainability and Green Innovations	Energy Club	25-26	04/10/2025	SDG 7, SDG 12, SDG 13

Sr. No	Name & Details of Activity	Organized By	A.Y.	Date/ Duration	Relevant SDG(s)
23	Microcontroller and Sensors Workshop	Energy Club	25-26	14/10/2025	SDG 4, SDG 9, SDG 11
24	Tree Plantation	CESA	23-24	19/08/2025	SDG 13, SDG 15
25	Stationary note book & pen donate to school STUDENTS	CESA	23-24	26/01/2024	SDG 6
26	Jal saptha (Awariness Programme)	CESA	23-24	26/01/2024	SDG 6 SDG 13
27	Engineers Day	CESA	23-24	15/09/2024	SDG 4 SDG 9
28	Constitution Day Celebration	NSS	23-24	26/11/2023	SDG 8
29	Engineers Day	CESA	24-25	15/09/2025	SDG 8 SDG 9
30	Maharashtra Day & Traditional Day Celebration	RCPIT	24-25	01/05/2025	SDG 4 SDG 8 SDG 11
31	Mother's Day Celebration	Student Affairs Department	22-23	9/05/2022	SDG 3 SDG 4 SDG 5
32	Visit to "SAMABHAV – International Film Festival"	MAVA	22-23	18/9/2023	SDG 5 SDG 10 SDG 16
33	Expert Talk on "Journey of Life – Know Thyself"	RCPIT	22-23	8/06/2022	SDG 3 SDG 4
34	Yoga Month Celebration & International Yoga Day 2022 "Yoga for Humanity".	RCPIT	22-23	21/06/2022	SDG 3 SDG 4:
35	Garba Night & Dandiya Raas Celebration (Navratri 2022)	RCPIT	22-23	22/09/2022 To 26/09/2022	SDG 4 SDG 11:
36	SAMARPAN – Distribution of fruits & Biscuits at Government Hospital	RCPIT	22-23	15/09/2022	SDG 3 SDG 10

Sr. No	Name & Details of Activity	Organized By	A.Y.	Date/ Duration	Relevant SDG(s)
37	Grain & Ration Donation Drive at Residential School, Thalner	RCPIT	22-23	28/11/2022	SDG 2 SDG 10
38	Awareness of Menstrual Hygiene & Distribution of Sanitary Pads	Student Affairs / Social Outreach	22-23	3/06/2022	SDG 3
39	Tree Plantation Drive on "Azadi Ka Amrit Mahotsav"	RCPIT	22-23	13/08/2022	SDG 13 SDG 15
40	VIHANGAM 2023 – Bird Feeder Making & Placement Drive	RCPIT	22-23	25/04/2023	SDG 13 SDG 15
41	Kargil Vijay Diwas Celebration	RCPIT	23-24	26/07/2023	SDG 13 SDG 16
42	Women's Day Outreach – Menstrual Health Awareness & Free Sanitary Pad Distribution	RCPIT	23-24	7/04/2024	SDG 3 SDG 5
43	Tree Plantation Program at Borkheda	RCPIT	23-24	27/08/2023	SDG 13 SDG 15
44	International Women's Day Session on Sexual Harassment at Workplace	RCPIT	23-24	8/03/2024	SDG 5 SDG 16
45	Women's Premier League (WPL) 2024 – Cricket Tournament Participation- Women's Premier League 2024	MPCT Shirpur & Astitva Foundation	23-24	5/03/2024 To 09/03/2024	SDG 3 SDG 5
46	BANDISH – A Musical Event	RCPIT	23-24	10/08/2024	SDG 4 SDG 11
47	COLOURWAVE – Drawing Competition (Theme: Indian Festivals)	RCPIT	24-25	28/02/2025	SDG 4 SDG 11
48	Sufi Night – A Celebration of Spiritual Music & Harmony	RCPIT	24-25	26/02/2024	SDG 4 SDG 11
49	UTSARG 2K25 – Five-Day Cultural Extravaganza	RCPIT	24-25	11/02/2025 To 15/02/2025	SDG 4 SDG 11

Sr. No	Name & Details of Activity	Organized By	A.Y.	Date/ Duration	Relevant SDG(s)
50	International Women's Day Celebration – Fun Games for Ladies Faculty	RCPIT	24-25	8/03/2025	SDG 5 SDG 3
51	Engineer's Cricket Championship (ECC) 2024.	RCPIT	24-25	28/08/2024	SDG 3

Students actively participated in community service programs such as cleanliness drives, health and hygiene awareness campaigns, blood donation camps, tree plantation drives, and road safety awareness programs in nearby villages and urban localities. These activities helped students develop leadership skills, teamwork, social responsibility, and ethical values.



Figure 9.14.1: Sample Outreach Activities

Unnat Bharat Abhiyan (UBA): Under the Unnat Bharat Abhiyan initiative, students adopted nearby villages and conducted need-based surveys focusing on sanitation, education, water management, digital literacy, and renewable energy awareness. Students interacted directly with villagers to identify local challenges and propose feasible technical and social solutions. On Unnat Bharat Abhiyan Foundation Day, R. C. Patel Institute of Technology, Shirpur organized a Plastic-Free Environment Awareness Camp at its adopted village — Rampur.



Figure 9.14.2: Unnat Bharat Abhiyan Activities

As part of this initiative, an awareness drive was conducted to promote environmental sustainability. Cloth bags were also distributed to encourage the reduction of plastic use and inspire the villagers to adopt eco-friendly practices.

Social Internship: A digital literacy and education support Programme was organized at Karvand Village ZP School to enhance rural students' learning skills and awareness of basic digital tools.



Figure 9.14.3: Photographs of Sample Outreach Activities

Outcomes and Impact

- Students demonstrated enhanced professional competencies, including leadership, teamwork, communication, and ethical responsibility through sustained community engagement.
- Improved ability to apply technical knowledge to real-life societal problems such as sanitation, water management, digital literacy, health awareness, and environmental sustainability.
- Increased awareness and commitment towards Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health & Well-being), SDG 4 (Quality Education), SDG 5 (Gender Equality), SDG 6 (Clean Water & Sanitation), SDG 11 (Sustainable Communities), SDG 13 (Climate Action), and SDG 15 (Life on Land).
- Development of civic sense and social sensitivity, aligning with Graduate Attributes and Program Outcomes related to ethics, environment, and lifelong learning.
- Positive social impact on adopted villages through cleanliness drives, plastic-free campaigns, digital literacy programs, health awareness activities, and education support initiatives.
- Improved health, hygiene, and environmental awareness among community members due to campaigns like Nasha-Mukta Bharat Abhiyan, Swachh Bharat Abhiyan, and tree plantation drives.
- Strengthened institution–society linkage under Unnat Bharat Abhiyan by addressing local needs through participatory surveys and sustainable solutions.
- Rural school students benefited from digital literacy and educational support, contributing directly to SDG 4 (Quality Education).
- Overall, these activities reinforced Outcome-Based Education (OBE) by ensuring holistic student development while contributing meaningfully to societal development and national priorities.

Engineering Graduates will be able to:

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

(B) PROGRAM SPECIFIC OUTCOME (PSOs)
Program should specify 2-4 program specific outcomes.

PSO1	Students will be able to apply Mechanical Engineering principles and modern tools to design and improve mechanical systems with innovative solutions.
PSO2	Students will demonstrate ethical practice, teamwork, and communication to develop engineering solutions for societal and sustainable development.

Declaration

The head of the institution needs to make a declaration as per the format given -

- I undertake that, the institution is well aware about the provisions in the NBA's accreditation manual concerned for this application, rules, regulations, notifications and NBA expert visit guidelines inforce as on date and the institutes hall fully abide by them.
- It is submitted that information provided in this Self Assessment Report is factually correct.
- I understand and agree that an appropriate disciplinary action against the Institute willbe initiated by the NBA. In case, any false statement/information is observed during pre-visit, visit, postvisit and subsequent to grant of accreditation.

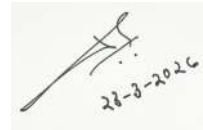
Head of the Institute

Prof. Dr. Jayantrao Bhaurao

Name : Patil

Designation : Director

Signature :



Seal of The Institution :



Place : Shirpur

Date : 23-03-2026 11:59:42