



Marathwada Mitramandal's
Institute of Technology, Pune

Department of Computer Engineering

**Outcome Based Education Manual
(OBE)**

*Quality Manual for Academic Planning
and Monitoring*

VISION

To achieve techno-social excellence by fostering innovative, sustainable and ubiquitous computing solutions for societal needs.

MISSION

M1 Providing quality education in computing through innovative pedagogy and research. (Foundation: teaching–learning process)

M2 Promoting innovation and creative thinking in technology-driven studies. (Skill development and mindset building)

M3 Encouraging real-world application of evolving technological trends. (Practice and application of knowledge)

M4 Developing industry-ready competencies among graduates. (Outcome: employability and professional readiness)

PROGRAM SPECIFIC OUTCOMES

PSO1 : Apply analytical and programming skills using open-ended environments to design, implement, test, and deliver solutions

PSO2 : Develop effective solutions using standard software engineering principles and life-cycle practices aligned with industry standards.

PROGRAM EDUCATIONAL OBJECTIVE (PEO)

PEO1 : Apply foundational knowledge of mathematics, science, and computer engineering to solve complex and computing problems.

PEO2 : Design, develop, and deliver innovative, sustainable, and industry-ready computing solutions using standard software engineering practices

PEO3 : Demonstrate ethical, social, and professional responsibility by integrating techno-social awareness and sustainable practices into engineering solutions.

PEO4 : Exhibit personal integrity, professional competence, teamwork, and leadership qualities to contribute effectively in multidisciplinary environments and to society

PROGRAM OUTCOMES (PO)

PO1-Engineering knowledge : Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop the solution of complex engineering problems.

PO2-Problem Analysis : Identify , Formulate , Review research literature , and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics , natural sciences, and engineering sciences.

PO3-Design /Development of Solutions : Design solutions for complex engineering Problems and design system components or processes that meet the specified needs with appropriate Consideration for the public health and safety , and the cultural , societal , and environmental considerations.

PO4-Conduct investigations of Complex Problems : Use research -based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems.

PO5-Mordern Tool Usage : Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6--The Engineer and Society : Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7-Environment and sustainability : Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8-Ethics : Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering profession.

PO9- Individual and Team work : Individual and team work function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10-Communication : Communicate effectively on complex engineering activities with the engineering community and with society at large, such as , being able to comprehend and write effective reports and design documentation, make elective presentations, and receive clear instructions.

PO11-Project Management and Finance : Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work , as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12-Life-Long Learning : Life long learning recognizes the need for, and has the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

OUTCOME BASED EDUCATION (OBE)

Outcome based education (OBE) is a student - centric instruction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills and attitudes. Its focus remains on evaluation of outcomes of the program by stating the knowledge, skill and behaviour a graduate is expected to attain upon completion of a program and after 4 – 5 years of graduation. Outcome Based Education (OBE) is a method of curriculum design and teaching that focuses on what students can actually do after they are taught. OBE's instructional planning process is a reverse of that associated with TE (Traditional Education) planning. The desired outcome is selected first and the curriculum, instructional materials and assessments are created to support the intended outcome. All educational decisions are made based on how best to facilitate the desired outcomes. Program Outcomes are essentially a range of skills and knowledge that a student will have at the time of graduation.

OBJECTIVES OF OBE

- Enable Students to do more challenging tasks: write project proposals, complete projects, analyse case studies, give case presentations, show their abilities to think, question, research, and make decisions based on the findings.
- Enable prospective students, parents, employers and others to understand the nature and level of learning outcomes (knowledge, skills, attitudes and values) or attributes a graduate of a programme should be capable of demonstrating on successful completion of the programme of study.
- Maintain national standards and international comparability of learning outcomes and academic standards to ensure global competitiveness, and to facilitate student/graduate mobility.
- Provide higher education institutions an important point of reference for designing teaching-learning strategies, assessing student learning levels, and periodic review of programmes and academic standards.

FRAMING COMMON POLICY FOR OBE IN INSTITUTE

Outcome-Based Education (OBE) is a student-centric learning model that helps teachers to plan the course delivery and assessment

- Define Mission statements, Vision statements for the Institute and department
- Define Program Educational Objectives
- Prepare lecture-wise Course Lesson Plan
- Define Course Objectives
- Define Course Outcomes with Bloom's Taxonomy for each course
- Define pedagogical tools for course outcomes delivery
- Map topics with Course outcomes
- Use Learning Management Tool such as Moodle for Assignments, Quizzes, Content beyond syllabus coverage, Tests, course feedback etc.
- Define rubrics for Tutorial, Practical, seminar, Mini Project, Final year Project
- Measure the attainment of each CO through Direct/Indirect assessments
- Track students performance
- Map courses with Program outcomes at suitable levels of Bloom's Taxonomy
- Identify Gaps in the Curriculum and adopt suitable measures to bridge the Gap
- Compare PO/PSO for last 3 academic years and propose remedial actions
- Assess the attainment of Program Educational Objectives

DRAFTING METHODOLOGY FOR IMPLEMENTATION OF OBE

Aspects of the Outcome Based Education:

The course is defined as a theory, practical or theory cum practical subject studied in a semester. For Eg. Engineering Mathematics

Programme is defined as the specialization or discipline of a Degree. It is the interconnected arrangement of courses, co-curricular and extracurricular activities to accomplish predetermined objectives leading to the awarding of a degree. For Example: B.E., Marine Engineering.

A few parameters that are required in order to measure Outcome-Based Education are:

Course Outcome (CO): COs are major domain specific outcomes written using action verbs which are specific, measurable and can be demonstrated by students on completion of the course. Course outcomes are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course. Generally six or more course outcomes may be specified for each course based on its weightage. Course outcomes are the measurable parameters which evaluate each student's performance for each course that the student undertakes in every semester.

Program Educational Objectives (PEOs): The Program Educational Objectives of a program are the statements that describe the expected achievements of graduates in their career, and also in particular, what the graduates are expected to perform and achieve during the first few years after graduation. PEOs should be consistent with the mission of the Institution. The PEO's should evolve through constant feedback from alumni, students, industry, management etc.,.

Programme Specific Outcomes (PSO) : Programme Specific Outcomes are what the students should be able to do at the time of graduation with reference to a specific discipline. Usually there are two to four PSOs for a programme.

Programme Outcomes: Program outcomes are narrower statements that describe what students are expected to know and be able to do by the time of graduation. They must reflect the 12 Graduate attributes as described by NBA for undergraduate engineering programs. Define PEO, PO, PSO and CO. This is the most important part of the Outcome-Based Education model. Course Outcomes (CO) are defined for all courses and Program Outcomes (PO)/Program Specific Outcomes (PSO) are measured for all programs in the institution. Course Outcome remains the base of the hierarchy of outcomes and is the tools that can be used to measure student performance in each course

STEP TO BE USED IMPLEMENTATION OF OBE IN THE INSTITUTE

1. Define Vision & Mission
2. Establish Program Educational Objectives (PEOs)
3. Define Program Outcomes (POs)
4. Define Course Outcomes (COs)
5. Map COs → POs
6. Design Curriculum & Teaching Methods
7. Develop Assessment Tools
8. Measure Outcome Attainment
9. Continuous Improvement (CQI Cycle)
10. Documentation & Accreditation Readiness
11. Faculty Training & Awareness
12. Stakeholder Involvement
13. Use Technology Tools

THE VARIOUS STEPS TO BE USED FOR IMPLEMENTATION OF OBE

Internal Stakeholders :

- Department Notice board
- HoD Office
- Department Board Room
- Display at Department Entrance
- Display in Laboratories & Classrooms
- Department corridors
- Admission brochure
- Placement Brochure
- Faculty course file
- Lab. manuals
- Library
- IQAC meetings
- Induction programs
- Student Chapter activities
- E-mail correspondence

External Stakeholders:

- Department Notice board
- HoD Office
- Display at Department Entrance
- Department corridors
- Admission brochure
- Placement Brochure
- Institute website
- Annual Magazine
- IQAC meetings
- Parent Teacher Meetings
- Alumni Meet
- Syllabus implementation workshops
- E-mail correspondence
- Industry Institute Meetings

METHODOLOGY TO IDENTIFY CURRICULAM GAPS

Course coordinators define for each course in alignment with the University syllabus and Outcome-Based Education (OBE) guidelines. Each CO and relevant curricular activity is mapped to the corresponding POs and PSOs by the course coordinators. The mapping is then reviewed and validated by the Module Coordinators and the Program Assessment Committee (PAC). POs and PSOs with weak correlations are analyzed to identify potential curricular gaps. Structured feedback and surveys related to POs and PSOs are collected from key stakeholders, including employers, alumni, and industry experts. Curriculum of reputed national institutions are reviewed to benchmark the program and identify additional gaps. The identified gaps are documented and submitted to the PAC Committee for discussion and necessary corrective actions. The Program Assessment Committee implements corrective measures by introducing content beyond the prescribed syllabus and communicates the recommendations to the University Board of Studies for consideration during syllabus revision.

METHODOLOGY TO IDENTIFY Course GAPS

i) Benchmarking GAP :

Curriculum Component	AICTE Credits	COEP	SPPU
Basic Sciences	29	14	23
Basic Engineering	27	18	22
Humanities and Social Sciences	12	8	2
Program Core/Major/Minor	58	53	86
Program Electives	9	19	12
Open Electives/multidisciplinary	9	6	6
Project(s)	10	9	12
Internships/Seminars	6	5	5
Any other (Please specify)- A. Ability enhancement B. Skill Enhancement C. Value add process D. etc.	0	10	2
Total number of credits:	160	142	170

CO Attainment Policy for Department of Computer Engineering

1. Setting CO Target

Setting the CO Target at the beginning of the semester is a proactive step to establish benchmarks for student performance. For the Department of Computer Engineering, the CO target is set as follows:

Theory Course & Practical Course: For the theory and practical course, the CO target is 1.8 in the level of 3 (i.e. 60% of attainment level)

If the 85 % of CO target is achieved, then it is incremented by 5% (i.e. if the target 1.8 is achieved then next year target is 1.89 for particular)

2. Setting CO Threshold

For both theory and practical courses, the threshold is defined based on the average percentage of marks obtained by students in the last three academic years for that subject. For newly introduced courses, a default threshold of 50% is considered.

3. Setting CO Attainment Level

Based on the defined threshold, attainment levels for both theory and practical courses are:

Level 3: $\geq 70\%$ students scoring above threshold

Level 2: $\geq 60-69\%$ students scoring above threshold

Level 1: $\geq 50-59\%$ students scoring above threshold

Target	85% Criteria for Attainment	Attained	If Attained, Then Increment by 5%
1.8	1.53	If attainment value is ≥ 1.53 , then attained	1.89
1.89	1.61	If attainment value is ≥ 1.61 , then attained	1.98
1.98	1.69	If attainment value is ≥ 1.69 , then attained	2.08
2.08	1.77	If attainment value is ≥ 1.77 , then attained	2.19
2.19	1.86	If attainment value is ≥ 1.86 , then attained	2.3
2.3	1.95	If attainment value is ≥ 1.95 , then attained	2.41
2.41	2.05	If attainment value is ≥ 2.05 , then attained	2.53
2.53	2.15	If attainment value is ≥ 2.15 , then attained	2.66
2.66	2.26	If attainment value is ≥ 2.26 , then attained	2.79
2.79	2.37	If attainment value is ≥ 2.37 , then attained	2.93

Criteria 3: Outcome Based Assessment (120)

3.1.	Evaluation of Continuous Assessment: Unit Tests, Mid-Term, Assignments, etc.	Claimed Marks (10)	Max Marks (10)
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The institute follows two curriculum structures as per the Savitribai Phule Pune University, i.e., 2019 Pattern for Third (TE) and Final Year (BE) classes, and 2024 Pattern for First (FE) and Second Year (SE) classes. The program has a structured Continuous Assessment comprising the different assessment tools as given below:

- Unit Tests
- Assignments
- Quizzes
- Case Studies
- In-semester examination at university level

From the above tools unit test, assignments and Insemester examination are mandatory whereas remaining tools are selected by the course teacher based on course requirements. The details of the assessment methods, schedule, and weightages are communicated to students in advance.

1. Unit Tests:

Process for setting and evaluating unit test question paper:

- The unit test question paper is prepared by the course teacher in accordance with the syllabus and the specified format provided by the university.
- The course teacher ensures proper coverage of designated units and alignment with the corresponding Course Outcomes (COs).
- Questions are designed across different Bloom's Taxonomy Levels (BTL) to assess knowledge, understanding, application, and analysis.
- A balanced distribution of questions across difficulty levels is maintained.

- The evaluation of the question paper is conducted through moderation and verification by the departmental quality check committee to ensure clarity, appropriate use of BTL, relevance, and an appropriate level of difficulty.

Quality of unit test questions, appropriateness of mapping with the COs:

- Each question in the unit test is mapped with specific COs.
- Questions are designed to assess knowledge, understanding, application, and analysis as per BTL.
- A variety of question types are included to ensure comprehensive assessment.
- Proper CO mapping ensures systematic and measurable coverage of course outcomes.
- Figure 3.1.1 shows a sample of mapping of questions with course outcomes and BTL.

“Techno-Social Excellence”
Marathwada Mitra Mandal’s
Institute of Technology, Lohgaon, Pune-47

Unit Test-II

Academic Year: 2025-26
Class : BE Comp Engg.
Div: A & B

Semester: I
Course Code: 410241
Course Name: Design and Analysis of Algorithms

Date: 29/10/2025
Max. Marks: 30
Time: 60 Minutes

Instructions:

1. Solve question 1 or 2 and 3 or 4
2. Mobile phones and programmable calculators are strictly prohibited
3. Assume suitable data whenever required

Question Paper Mapping of Blooms Taxonomy level and CO

Q. No		Question	Marks	Blooms level	CO
		Unit 5 (for 15 Marks)			
1	A	Discuss the accounting method for amortized analysis, Discuss it with operations on stack and counter.	7	L2	CO5
	B	Analyze multithreaded algorithms with suitable examples? Explain the concept of parallel loops	8	L4	CO5
OR					
2	A	Explain binary heap algorithm with its complexity analysis	8	L2	CO5
	B	Write & Explain sorting algorithm for embedded systems and state its time complexity?	7	L3	CO5
		Unit 6 (for 15 Marks)			
3	A	Analyze multithreaded algorithms with suitable examples?	8	L4	CO6
	B	Explain distributed breadth first search algorithm for 2D partitioning	7	L2	CO6
OR					
4	A	Write the analysis of multithreaded algorithms with an example	8	L3	CO6
	B	Write and explain the algorithm for multithreaded matrix multiplication	7	L2	CO6

-----ALL THE BEST-----

Figure 3.1.1 Sample of Mapping of questions with Course Outcomes and Bloom’s Taxonomy

Assessment of course outcomes coverage in unit tests:

- Unit tests are designed to ensure coverage of syllabus units and corresponding COs.
- CO-wise performance analysis is carried out based on student scores.
- CO attainment is calculated to ensure outcome-based education.
- The institute follows two curriculum (2019 and 2024 patterns) provided by the university and the assessment process is aligned accordingly. Following tables 3.1.1 & 3.1.2 shows course outcomes coverage in unit tests for 2019 pattern and 2024 patterns.

Table 3.1.1 Course Outcomes Coverage in Unit Test for 2019 Pattern

Assessment Tools	Syllabus Coverage	CO Coverage
Unit Test-1	Unit 1 and Unit 2	CO1, CO2
Unit Test-2	Unit 5 and Unit 6	CO5, CO6

Table 3.1.2 Course Outcomes Coverage in Unit Test for 2024 Pattern

Assessment Tools	Syllabus Coverage	CO Coverage
Unit Test-1	Unit 1 and Unit 2	CO1, CO2

Sharing of Post-Evaluation Feedback with Students for Performance Improvement:

- Evaluated answer sheets are shown and discussed with students in the classroom.
- Common mistakes, expected answers and model solutions are explained.
- Feedback is provided in the classroom to support performance improvement.
- Actions such as personal doubt-clearing sessions and practice problems are conducted for concerned student

2. Assignments:

- Process for setting questions and evaluating Assignments:
- Assignments are focused on units 3 & 4 for the 2019 pattern and 2024 pattern which are aligned with CO3 and CO4.
- Assignments are designed by the course teacher based on syllabus coverage and CO alignment.
- Questions emphasize application, analysis, and problem-solving skills.

Quality of Questions and Appropriateness of Mapping with Course Outcomes (COs):

- Each question in the assignment is carefully mapped to specific COs and appropriate Bloom's Taxonomy Levels (BTL). The BTL mapping is of good quality, ensuring a balanced mix of basic understanding, application, analysis, and higher-order thinking skills.
- The assignment questions are designed to check a student's conceptual clarity, analytical thinking, and ability to apply knowledge in different situations. A variety of question types are included to make the assessment more effective and engaging.
- Proper CO mapping ensures clear alignment with learning goals and helps in systematic and measurable achievement of course outcomes.

Assessment of Course Outcomes Coverage in Assignments:

- Assignments are designed to ensure coverage of syllabus units and corresponding COs.
- CO-wise performance analysis is carried out based on score.
- CO attainment is calculated to ensure outcome-based education.
- The institute follows two curriculum (2019 and 2024 patterns) provided by the university and the assessment process is aligned accordingly. Following table 3.1.3 shows course outcomes coverage in assignments for 2019 pattern and 2024 patterns.

Table 3.1.3 Course Outcomes Coverage in Assignments

Assessment Tools	Curriculum Structure	Syllabus Coverage	CO Coverage
Assignment s	2019 Pattern	Unit 3 and Unit 4	CO3, CO4
	2024 Pattern		

Sharing of Post-Evaluation Feedback with Students for Performance Improvement:

- Evaluation is carried out using predefined rubrics to ensure transparency and consistency. Table 3.1.4 shows assignment rubrics.
- Figure 3.1.2 shows sample assignment evaluation sheet.
- Evaluated assignments are shown and discussed with students in the classroom.
- Evaluated assignments are returned to students.
- Common mistakes and expected answers are explained.
- Doubts are clarified to improve understanding.

Table 3.1.4 Assignment Rubrics

Assessment Criteria	Marks			
Solution to Problem / Questions	5 Marks	3 Marks	1-2 Marks	0 Marks
	Students solved all the questions with unique solution	Students solved all questions but no unique solution	Student copied answers of the questions	Student did not submitted
Punctuality	2 Marks	1 Marks	0 Marks	
	Students completed within time	Students submitted assignment after a stipulated time	Student not submitted assignment	
Understanding	3 Marks	2 Marks	1 Marks	0 Marks
	Students solved all questions correctly with proper understanding	Students solved all questions with few correct answers shows good understanding	Students solved few questions with poor understanding	Students did not answer any questions, shows no understanding

MMIT, Lohgaon, Pune - 47										
Assignment Marks										
Department of Computer Engineering										
AY: 2025-26 (Sem 1)			Subject: Discrete Mathematics				Faculty: Dinesh Satre & Shwetal Patil			
			Assignment on Unit-III				Assignment on Unit-IV			
			Solution to Problem / Questions	Punctuality	Understanding	Total Marks	Solution to Problem / Questions	Punctuality	Understanding	Total Marks
Roll No.	Exam Seat Num	Name of Student	5	2	3	10	5	2	3	10
SEA02		HANMANT PARMESHWAR AGLAVE	4	2	2	8	4	2	2	8
SEA03		AKANKSHYA SAHU	4	2	2	8	4	2	3	9
SEA04		ANUSHKA UMESH KARDILE	5	2	3	10	5	2	3	10
SEA05		ATHARVA AGARWAL	5	2	3	10	4	2	3	9
SEA06		KALYANI LALIT ATTARDE	0	0	0	0	0	0	0	0
SEA07		YASHRAJ SHIVAJI AUTI	5	2	3	10	5	2	3	10
SEA08		DHANRAJ SAMADHAN BAGAL	0	0	0	0	0	0	0	0
SEA09		NIKITA GANESH BARAVKAR	5	2	3	10	4	1	2	7
SEA10		RUSHIKESH GOVINDA BELOKAR	0	0	0	0	0	0	0	0
SEA11		SRUSHTI VILAS BENDBHAR	4	2	3	9	4	2	3	9
SEA12		YASH MAHENDRA BHAVSAR	4	2	3	9	4	2	2	8
SEA13		BHUMI VILAS KADAM	4	2	2	8	4	2	3	9
SEA14		BHAVESH HIMMATRAM CHOUDHARY	5	2	3	10	4	2	3	9
SEA15		MANAV NITIN DHANAVADE	5	2	3	10	4	2	2	8
SEA16		SURAJ VIJAY DHOK	4	1	2	7	4	1	2	7
SEA17		ABHISHEK RAMESHWAR DHOLE	4	2	2	8	4	1	2	7
SEA18		MANTHAN VISHWANATH DHOTRE	0	0	0	0	0	0	0	0
SEA19		VAISHNAVI PANDURANG FATANGADE	5	2	3	10	5	2	3	10
SEA20		SUJAL SHANKAR GODASE	4	1	2	7	4	1	2	7
SEA21		PARFFUL RAJ KUMAR JADHAV	4	1	2	7	4	2	2	8
SEA22		SAHIL SANJAY JADHAV	0	0	0	0	4	2	2	8
SEA23		MIHIR DEEPAK JAGTAP	4	1	2	7	4	1	2	7
SEA25		ISHAN SAMINDAR KAKADE	5	2	3	10	4	1	2	7
SEA26		OMKAR DEVIDAS KALE	4	2	3	9	4	2	2	8
SEA27		RAM RAVINDRA KALMEGH	5	2	3	10	5	2	3	10
SEA29		TRUPTI TANAJI KAMBLE	5	2	3	10	4	2	2	8
SEA30		PANKAJ SUBHASH KARALE	5	2	3	10	4	2	2	8

Figure 3.1.2 Sample Assignment Evaluation Sheet

3. Quizzes:

- Quizzes are conducted by the course teacher as per the 2024 curriculum pattern.
- Questions are framed to assess application, analytical thinking, problem-solving skills and real-world understanding, with each question mapped to specific CO.
- Evaluation is conducted using a predefined marking scheme to ensure consistency and fairness, and CO-wise performance analysis is carried out for attainment calculation.
- Quiz marks are communicated to students in class along with feedback to enhance understanding and resolve doubts.

4. Case Study:

Process for setting and evaluation:

Case studies are designed by the course coordinator based on syllabus coverage. These tools focus on units 3 & 4 and are aligned with CO3 and CO4 respectively. Problem statements are framed to encourage real-world application, analysis, and decision-making skills. Evaluation is carried out using predefined rubrics to ensure consistency and fairness.

Quality of questions and CO mapping:

Each case study is mapped to specific COs. Questions emphasize analytical thinking, practical understanding and problem-solving ability. CO mapping ensures effective coverage of CO3 and CO4.

Assessment of CO coverage:

Case studies cover Units 3 and 4 aligned with CO3 and CO4, carrying 12 marks (6 marks per unit) as per the 2024 pattern. CO-wise performance analysis is conducted for attainment calculation.

Feedback mechanism:

The case study is discussed after evaluation to highlight key ideas and clear doubts.

5. In-semester examination at University level for 2019 curriculum pattern:

Process for setting and evaluating in-semester examination question paper:

- The institute follows two curriculum structures (2019 and 2024 patterns) and the In-Semester Examination (In-Sem) is conducted only for the 2019 curriculum pattern. The question paper setting process is carried out at the university level, while the assessment is conducted at the institute level.
- The In-Semester Examination (In-Sem) is conducted by Savitribai Phule Pune University (SPPU), Pune. It carries 30 marks, covers units 1 (question 1 and question 2) and unit 2 (question 3 and question 4) and consists of descriptive-type questions, as shown in Figure 3.1.3.
- The question paper is prepared by the subject chairman and two paper setters appointed by SPPU, Pune.

- The chairman and two paper setters ensure proper coverage of designated units and alignment with the corresponding COs as per the university curriculum.
- Questions are designed across different levels of Bloom's Taxonomy to assess knowledge, understanding, application, and analysis
- The subject chairman conducts a meeting with paper setters and collectively evaluates a balanced distribution of questions across difficulty levels. Also evaluates the quality and finalizes the question papers.
- It is noteworthy that the department faculty members contribute in the capacity of subject chairman or paper setter as appointed by the university for question paper setting.
- The subject chairman submits three sets of question papers along with the corresponding model answers and detailed marking scheme to the university.
- The university selects any one of the three question papers and sends them to the institute through the university portal.

Total No. of Questions : 4]

SEAT No. :

PC184

[6361]-42

[Total No. of Pages : 1

B.E. (Computer Engineering) (Insem)
MACHINE LEARNING
(2019 Pattern) (Semester - VII) (410242)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4.
- 2) Figures to the right indicates full marks.
- 3) Draw neat diagram wherever necessary.
- 4) Assume suitable data, if necessary.

- CO1 Q1)** a) Describe in detail different Machine Learning models used. [5] **BT L**
b) What are the main differences between supervised learning and reinforcement learning? [5] **L 2**
c) Explain geometric models and its types. [5] **L 4**
- CO1 Q2)** a) Compare Artificial intelligence and Machine learning. [5] **L 2**
b) Describe the various steps involved in developing a machine learning application. [5] **L 4**
c) Describe grouping and grading models. [5] **L 2**
- CO2 Q3)** a) Convert given data set in normalized data set. $D = \{23, 29, 52, 31, 45, 19, 18, 27\}$. [8] **L 3**
b) Why do you need categorical variable encoding? With an example, explain one-hot encoding. [7] **L 3**
- CO2 Q4)** a) Which statistical methods are used to describe the nature of data? [5] **L 1**
b) What are the feature of multidimensional scaling? [5] **L 2**
c) Elaborate use of PCA in preprocessing stage. [5] **L 4**

* * *

Figure 3.1.3 Sample copy of Insem Question Paper

Quality of in-semester examination questions and mapping with the COs:

- Each question in the in-semester examination is mapped with CO1 and CO2 as per the university curriculum.
- Questions are designed to assess conceptual understanding, analytical ability, and application of knowledge.
- A variety of question types are included to ensure comprehensive assessment.
- Proper CO mapping ensures systematic and measurable coverage of course outcomes.
- Following table 3.1.4 shows CO Coverage of In-Semester Examination (Mid Term Exam) for 2019 Pattern.

Table 3.1.4 Course Outcomes Coverage In-Semester Examination

Assessment Tool	Curriculum Structure	Syllabus Coverage	CO Coverage
In-semester examination (Mid term exam)	2019 Pattern	Unit 1 & Unit 2	CO1 & CO2

Assessment of CO Coverage in in-semester examination:

- In-Semester examinations are designed to ensure coverage of specified syllabus units and corresponding COs.
- CO-wise performance analysis is carried out based on student scores.
- Based on students' performance, the course teacher calculates the CO attainment for the In-Sem examination.

Sharing of Post-Evaluation Feedback with Students for Performance

Improvement:

- The university conducts the examination in coordination with the institutes as per the timetable communicated earlier.
- Evaluation is carried out at the institute level by the course teacher.
- The results of the In-Sem examination are displayed on the notice board to ensure transparency.

- Common mistakes, expected answers and model solutions are discussed with students.


Savitribai Phule Pune University
 Examination Session
 Marks Inward System for Colleges


 2512230123528

12/23/2025
1 of 1

College Name	CEGP013870 - MARATHIWADA MITRA MANDAL'S INSTITUTE OF TECHNOLOGY		
Pattern Name	7041976 - B.E. (2019 PAT.)(COMPUTER)	Batch No	202510047100
Subject Name	410242 - MACHINE LEARNING	Exam Type	INTERNAL OUT OF 30
Teacher Name	Karad Snehal Amol - Internal Examiner		

Total Students	Present Students	Absent Students	Not Applicable	Detained
70	70	0	0	0

Seat No	Marks/Grade	Seat No	Marks/Grade	Seat No	Marks/Grade
B400590059	26	B400590085	20	B400590110	22
B400590060	21	B400590086	26	B400590111	18
B400590061	22	B400590087	21	B400590112	25
B400590062	27	B400590088	22	B400590113	26
B400590063	28	B400590089	21	B400590114	24
B400590065	22	B400590090	8	B400590115	17
B400590066	23	B400590091	21	B400590116	26
B400590067	11	B400590092	13	B400590117	26
B400590068	23	B400590093	22	B400590118	21
B400590069	23	B400590094	19	B400590119	14
B400590070	26	B400590095	21	B400590120	21
B400590071	14	B400590096	10	B400590121	12
B400590072	23	B400590097	22	B400590122	25
B400590073	26	B400590098	27	B400590123	24
B400590074	23	B400590099	24	B400590124	22
B400590075	23	B400590100	25	B400590125	20
B400590076	24	B400590101	22	B400590126	20
B400590077	16	B400590102	22	B400590127	18
B400590078	23	B400590103	30	B400590128	24
B400590079	26	B400590104	28	B400590129	26
B400590080	23	B400590105	27		
B400590081	19	B400590106	27		
B400590082	24	B400590107	24		
B400590083	24	B400590108	22		
B400590084	24	B400590109	15		



Figure 3.1.4 Sample copy of In-semester Evaluation displayed at University Portal

3.2	Evaluation of Semester End Exam (SEE) Question Paper	Claimed Marks (10)	Max Marks (10)
------------	---	-----------------------------------	-------------------------------

The institute is affiliated with Savitribai Phule Pune University (SPPU), Pune, and the Semester End Examination (SEE) is conducted according to the rules and regulations prescribed by the University. The responsibility for question paper setting, exam conduction and evaluation lies with the university. Figure 3.2.1 shows the SEE question paper setting and evaluation process under the university (SPPU).

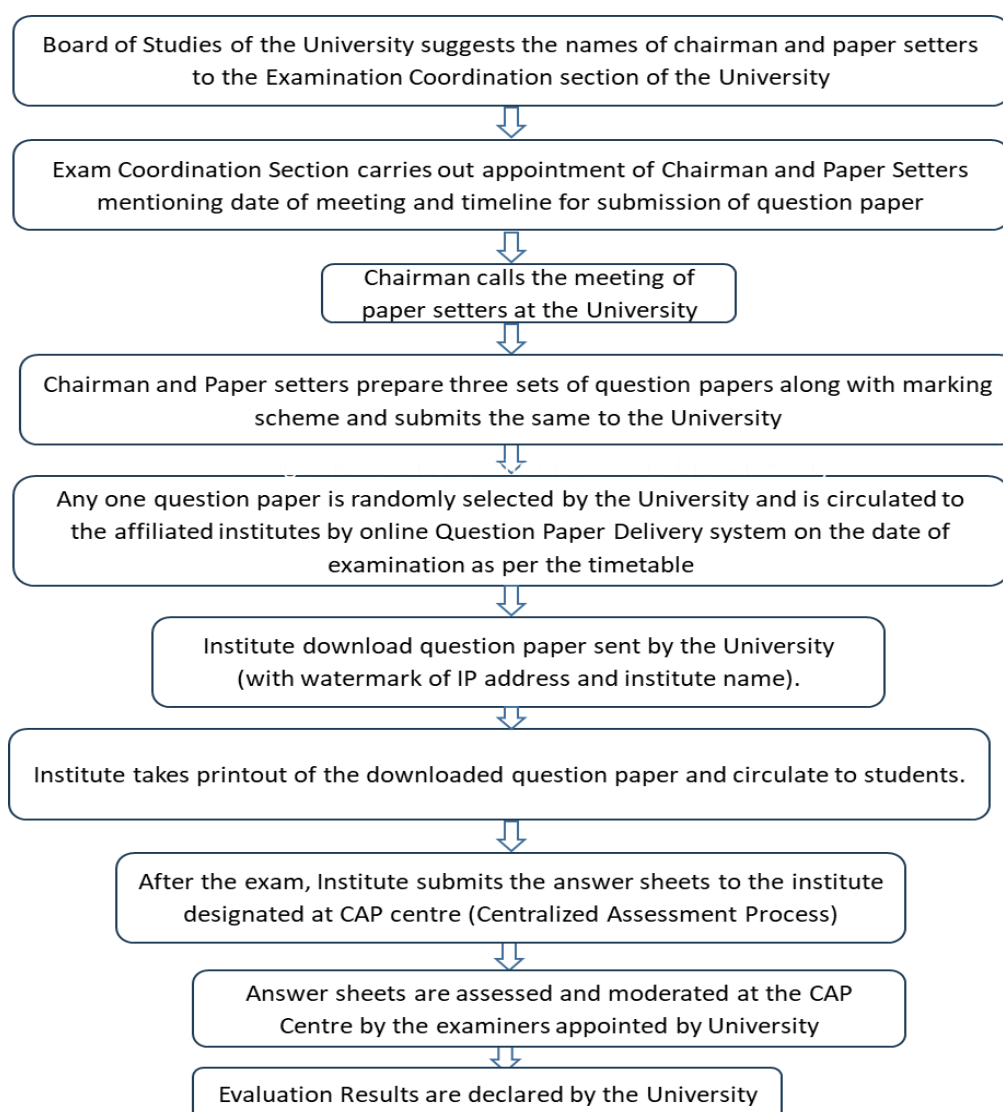


Figure 3.2.1 Process for setting of Semester End Exam question paper

A. Process for Setting and Evaluation of Semester-End Exam Question Paper:

- The question papers are set by university-appointed examiners. The question paper is prepared by the subject chairman and two paper setters appointed by SPPU, Pune.
- It is noteworthy that the department faculty members contribute in the capacity of subject chairman or paper setter as appointed by the university for question paper setting.
- The chairman and two paper setters ensures proper coverage of designated units and alignment with the corresponding COs as per Table 3.2.1
- Questions are designed across different levels of Bloom's Taxonomy Levels (BTL) to assess knowledge, understanding, application, and analysis.
- The subject chairman conducts a meeting with paper setters and collectively evaluates a balanced distribution of questions across difficulty levels. Also evaluates the quality and finalizes the question papers.
- The subject chairman submits three sets of question papers along with the corresponding model answers and detailed marking scheme to the University.
- The university selects any one of the three question papers and sends them to the institute through the university portal.
- Figure 3.2.2 shows sample copy of university question paper setting appointment order for End semester examination.

To,
Dongare Yogesh B
College: Marathwada Mitra Mandal Marathwada Mitra Mandal's Institute of Technology Addr: Survey no 35 Plot No.5/6 Lohgao Pune Ta: Pune (corporation Area) Dist: Pune
Mobile No. : 9637325959 **Email :** yogesh.dongare05@gmail.com

Sir/ Madam,

You have been appointed for Central Assessment Programme (CAP) details as follows

Post Name	Examination	Paper / Subject	Chairman	Schedule Date
Paper Setter & Examiner CAP Appt No. 2520181950	S.E. 2024 Pattern End Sem (Theory) BOS:Computer Engineering 	Exam - S.E. 2024 Pattern End Sem Paper-Object Oriented programming and Computer Graphics (PCC-202-COM) , (Theory)	Raghatwan Jyoti Sudhakar Sinhgad Technical Education Society Rasiklal M. Dhariwal Sinhgad Technical Institutes Campus Addr: 111/1WarjeMumbai-Banglore bypassPune Ta: Pune (corporation Area) Dist: Pune 9980655177	From : 20/12/2025

CAP Center Name & Address :	Akhil Bharatiya Maratha Shikshan Parishad, Pune Anantrao Pawar College of Engineering & Research Addr: S No 103 Shahu College Campus Parvati Pune 09 Ta: Pune (corporation Area) Dist: Pune
Telephone No. :	020-24218901
Email Id :	abmspcoe@yahoo.com
CAP Director :	Name: THAKARE SUNIL BHIMRAO Contact Person Mob No.: 9422863496

Please note that As per Maharashtra Public Universities Act, 2016 It shall be obligatory on every teacher and on the non-teaching employee of the university, affiliated, conducted or autonomous college or recognized institution to render necessary assistance and service in respect of examinations of the university. If any teacher or non-teaching employee fails to comply with the order of the university or college or institution, in this respect, it shall be treated as misconduct and the employee shall be liable for disciplinary action".

I seek your co-operation.

Thanking You

Yours faithfully,
For CAP Director

To,
The Principal/Directors,
You are requested to relieve the teachers for paper setting. Also requested to communicate names of the teacher/s who remain absent for the work of paper setting, the said information is required for submission to the University Authorities for necessary action under the provisions of section 48(4) of the Maharashtra Universities Act,2016.

For early payment of examination work remuneration through ECS, you are requested to update your BCUD online teacher profile with financial details. Also submit printed copy of same at the time of paper setting meeting. For details contact 02025601235

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Figure 3.2.2 Sample copy of university question paper setting appointment order for End semester examination.

B. Quality of Questions and Appropriateness of Mapping with COs:

- Unit wise each question in the Semester End Examination (SEE) is mapped with specific COs as per Table 3.2.1.
- Questions are designed to assess conceptual understanding, analytical ability, and application of knowledge.
- A variety of question types are included to ensure quality of questions as shown in Figure 3.2.3, a sample copy of the end semester question paper.
- Proper CO mapping ensures systematic and measurable coverage of COs.
- As the university question paper does not provide mapping of questions with COs, the course coordinator maps each question to the respective CO for attainment calculation.
- CO-wise performance analysis is carried out based on student scores.
- Based on students' performance, the course teacher calculates the CO attainment for the SEE.
- The institute follows two curriculum structures (2019 and 2024 patterns) and the assessment process is aligned accordingly. Following table 3.2.1 shows course outcomes coverage in SEE for 2019 pattern and 2024 patterns.

Table 3.2.1 Course Outcomes Coverage in Semester End Examination

Assessment Tool	Curriculum Structure	Syllabus Coverage	CO coverage
Semester End Examination (SEE)	2019 Pattern	Unit 3, 4, 5, 6	CO3, CO4, CO5, CO6
	2024 Pattern	Unit 1, 2, 3, 4, 5	CO1, CO2, CO3, CO4, CO5

Total No. of Questions : 8]	SEAT No. : _____	[Total No. of Pages : 2
PD4250	[6403]-45	
T.E. (Computer Engineering) ARTIFICIAL INTELLIGENCE (2019 Pattern) (Semester - VI) (310253)		
Time : 2½ Hours]		[Max. Marks : 70
Instructions to the candidates:		
1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.		
2) Neat diagrams must be drawn wherever necessary.		
3) Figures to the right side indicate full marks.		
4) Assume Suitable data if necessary.		

CO	Q1) a) Explain Alpha-Beta tree search and cut off procedure with example. [9] L2 b) Explain in details the concept of backtracking and constraint propagation to solve n-queens problem. [8] L4 OR Q2) a) What is constraint satisfaction problem? Explain with example. [5] L2 b) Compare and contrast the statistics games and partial observable games. [4] L4 c) How AI technique is used to solve tic-tac-toe problem. [8] L3
CO3	Q3) a) Explain Wumpus world environment with PEAS description. [9] L2 b) What is knowledge representation in propositional logic? Compare and contrast PL and FOL. [8] L4 OR Q4) a) Explain different inference rules in FOL with suitable example. [9] L3 b) What is an agent? Explain knowledge based agent with architecture diagram, also state the significance of inference engine. [8] L2
CO5	Q5) a) Illustrate with an example the use of the unification algorithm to prove the concept of resolution. [9] L3 b) Define and explain the forward chaining with example, analyze the differences between forward and backward chaining. [9] L4 OR

CO5	Q6) a) Describe Ontological Engineering w. r. t. Categories, Objects and Model. [9] L2 b) Define First order Logic, Explain FOL inference for following classifiers. [9] L2 i) Universal Generalization ii) Universal Instantiation iii) Existential Instantiation iv) Existential Introduction
CO6	Q7) a) Explain the algorithm for classical planning with an example. [6] L3 b) Analyze various planning approaches in AI. [6] L4 c) Explain the Hierarchical planning with relevant example. [6] L3 OR Q8) a) Explain with example how planning is different than problem solving. [6] L4 b) Explain types of planning in details. [6] L2 c) Explain AI components and AI Architecture. [6] L2

[6403]-45

2

C. Transparency of Post Evaluation Process:

The evaluation of masked answer books is conducted by the examiners appointed by the University through the Central Assessment Program (CAP). A sample assessment appointment order is presented in Figure 3.2.4. The university ensures transparency in the post-evaluation process through the university's Student Profile System (SPS). After result declaration, students can apply for a photocopy of their answer sheets within the given timeline and the evaluated copies are made available in their SPS login. Students verify their answers and consult the respective course teacher and if any discrepancy is found, they can apply for rechecking or revaluation through SPS login. After completion of the revaluation/rechecking process at university level, the revised results are communicated to the students through the official system. This structured process ensures fairness, allows verification, and maintains credibility in the examination system.

To,
Bhoye Tejaswini Sunil
College: Marathwada Mitra Mandal Marathwada Mitra Mandal's Institute of Technology Addr: Survey
no 35 Plot No.5/6 Lohgao Pune Ta: Pune (corporation Area) Dist: Pune
Mobile No. : 8087610958 **Email :** tejaswini.chaure@gmail.com

Sir/ Madam,

You have been appointed for Central Assessment Programme (CAP) details as follows

Post Name	Examination	Paper / Subject	Chairman	Schedule Date
Moderator CAP Appt No. 2210080473	BE 2015 (Endsem) (Theory) BOS:Computer Engineering 	Exam - BE 2015 (Endsem) Paper-Soft Computing and Optimization Algorithms (410252D) ,(Theory)	Pise Priya Jeevan Chanakya Education Society Indira College of Engineering And Management Addr: Parandwadi Ta: Mawal Dist: Pune 8975032398	From : 29/06/2022

CAP Center Name & Address :	Jayawant Shikshan Prasarak Mandal IMPERIAL COLLEGE OF ENGINEERING AND RESEARCH Addr: Pune Nagar Road Wagholi Pune Ta: Haweli(excluding Corporation Area) Dist: Pune
Telephone No. :	020-67335100
Email Id :	office.icoer@gmail.com
CAP Director :	Name: Rajkumar Shridhar Deshpande Contact Person Mob No.: 8308818790

Please note that As per Maharashtra Public Universities Act, 2016 It shall be obligatory on every teacher and on the non-teaching employee of the university, affiliated, conducted or autonomous college or recognized institution to render necessary assistance and service in respect of examinations of the university. If any teacher or non-teaching employee fails to comply with the order of the university or college or institution, in this respect, it shall be treated as misconduct and the employee shall be liable for disciplinary action".

I seek your co-operation.

Thanking You

Yours faithfully,
For CAP Director

To,
The Principal/Directors,
You are requested to relieve the teachers for paper setting. Also requested to communicate names of the teacher/s who remain absent for the work of paper setting, the said information is required for submission to the University Authorities for necessary action under the provisions of section 48(4) of the Maharashtra Universities Act,2016.

For early payment of examination work remuneration through ECS, you are requested to update your BCUD online teacher profile with financial details. Also submit printed copy of same at the time of paper setting meeting. For details contact 02025601235

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Figure 3.2.4 A sample assessment appointment order

3.3.	Evaluation of Laboratory Work and Workshop (Continuous and SEE)	Claimed Marks (10)	Max Marks (10)
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A. Evaluation of experiments conducted in laboratories

Every laboratory course is supported by a structured laboratory manual containing experiment objectives, procedures, analysis methods and result interpretation guidelines.

The evaluation of laboratory courses is carried out through a combination of Continuous Internal Evaluation (CIE) and Semester End Examination (SEE).

During the semester, students are continuously assessed based on their performance in practical sessions. The major assessment parameters include:

- Understanding of experiment objectives, theory, and procedure
- Conduct of experiment and practical skills
- Handling of tools, instruments, and equipment
- Journal writing / laboratory record maintenance
- Observation analysis, calculations and result interpretation

At the end of the semester, the final Practical / Oral / Term Work Examination for all laboratory courses are conducted as per university norms.

The examination is jointly conducted by a university-appointed external examiner and the internal examiner (course coordinator). Both examiners jointly assess student performance to ensure objectivity. The marks awarded are entered on the university portal by the internal examiner and verified/confirmed by the external examiner for result processing. This process ensures fairness, transparency, uniformity and standardization in laboratory evaluation.

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

Rubric-based assessment is adopted to ensure consistency, transparency and outcome-based evaluation of student performance in laboratory courses. Predefined rubrics with clearly defined performance levels and assessment criteria

are prepared for each experiment/activity. The rubrics generally assess the following domains:

- **Cognitive Domain:** Conceptual understanding, theory knowledge, analytical ability and interpretation of results
- **Psychomotor Domain:** Practical execution, use of tools/equipment and experimentation skills
- **Affective Domain:** Discipline, responsibility, teamwork, punctuality, professional ethics, and safety practices

Each rubric parameter is mapped with relevant Course Outcomes (COs) and corresponding Program Outcomes (POs) / Program Specific Outcomes (PSOs) to facilitate effective attainment measurement. Rubric-based continuous assessment provides a systematic mechanism for evaluating student learning and attainment of COs, POs and PSOs. For continuous assessment of experiments, a rubric-based evaluation scheme is adopted. A sample rubric for an experiment is shown in Table 3.3.1.

Table 3.3.1: Rubrics for experiment Evaluation

Parameter	Good	Average	Poor	Domain
Experiment Execution	Clearly understands and executes the experiment correctly with minimal/no errors (4)	Partial understanding; executes with errors or needs guidance (2–3)	Unable to understand or execute (0–1)	Psychomotor
Timely Completion	Completed within the practical hour (2)	Completed with delay (up to one week) (1)	Not executed (0)	Affective

210246.2 Analyze searching and sorting algorithms to organize and retrieve data efficiently while comparing their performance characteristics.	2	3	2	3	1	-	-	-	-	-	-	-	3	2
210246.3 Design dynamic data structures such as linked lists and stacks, and apply recursion and backtracking techniques to solve complex computational problems.	2	3	3	2	1	-	-	-	-	-	-	-	3	2
210246.4 Implement queue-based data structures including simple queues, priority queues, dequeues, and circular queues to model real-world scheduling and service systems.	2	2	3	1	1	-	-	-	-	-	-	-	3	2

The evaluation of laboratory courses is carried out through a combination of **Continuous Internal Evaluation (CIE)** and **Semester End Examination (SEE)**.

3.4.	Evaluation of Internship (Continuous and SEE)	Claimed Marks (10)	Max Marks (10)
-------------	--	---------------------------	-----------------------

The Internship course is an integral part of the program curriculum and is implemented as per the curriculum structure. It ensures structured planning, execution, monitoring, assessment, and evaluation of internship activities. The internship is to be completed after Semester V and before the commencement of Semester VI, with a minimum duration of 4 to 6 weeks as per curriculum guidelines. The work carried out during the internship is assessed and evaluated in Semester VI in accordance with university norms. Additionally, feedback is collected from students after the successful completion of the internship to support analysis and continuous improvement. The internship course is also mapped with relevant Program Outcomes (POs) and Program Specific Outcomes (PSOs) to measure its contribution to overall program attainment. Figure. 3.4.1 shows the curriculum structure of TE Computer- Semester VI - 310255 Internship.

Savitribai Phule Pune University														
Third Year of Computer Engineering (2019 Course)														
(With effect from Academic Year 2021-22)														
Semester VI														
Course Code	Course Name	Teaching Scheme (Hours/ week)			Examination Scheme and Marks						Credit Scheme			
		Lecture	Practical	Tutorial	Mid-Sem	End-Sem	Term work	Practical	Oral	Total	Lecture	Practical	Tutorial	Total
310251	Data Science and Big Data Analytics	03	-	-	30	70	-	-	-	100	03	-	-	03
310252	Web Technology	03	-	-	30	70	-	-	-	100	03	-	-	03
310253	Artificial Intelligence	03	-	-	30	70	-	-	-	100	03	-	-	03
310254	Elective II	03	-	-	30	70	-	-	-	100	03	-	-	03
310255	Internship**	-	**	-	-	-	100**	-	-	100	-	04**	-	04
310256	Data Science and Big Data Analytics Laboratory	-	04	-	-	-	50	25	-	75	-	02	-	02
310257	Web Technology Laboratory	-	02	-	-	-	25	-	25	50	-	01	-	01
310258	Laboratory Practice II	-	04	-	-	-	50	25	-	75	-	02	-	02
Total											12	09	-	21
Total		12	10	-	120	280	225	50	25	700	12	05	-	21

Figure 3.4.1 Curriculum structure of TE Computer- Semester VI - 310255 Internship

A. Relevance of Internship

- Internships are an important component of outcome-based engineering education.
- Internship provides students an opportunity to understand the applications of the classroom concepts in real industrial environments.
- Industrial exposure adds professional value beyond conventional classroom teaching.
- Students become familiar with industrial tools, equipment, software, technologies, and their practical applications.
- Training helps students understand real-life engineering problems and select suitable technologies or methods for solving them.
- It creates awareness regarding social, economic, managerial, and administrative factors affecting industrial organizations.
- Internships help students develop professional ethics, responsibility, discipline, and workplace behavior.
- Students gain clarity about career opportunities and can identify suitable career goals.
- It supports networking with industry professionals and development of professional relationships.
- Exposure to real work environments develops competent, confident, and industry-ready graduates.

B. Rubrics used for assessing student industrial training/internships and appropriateness of mapping with POs and PSOs

Student performance during the internship is evaluated through a structured rubric-based assessment system to ensure objective, transparent, and outcome-based evaluation. The POs and PSOs are systematically mapped to the assessment parameters included in the rubrics. This rubric-based approach enables comprehensive evaluation of the knowledge acquired, practical skills developed, professional attitude, communication abilities and overall learning outcomes achieved by students during the internship period. Following tables 3.4.1 & 3.4.2 show rubrics used for internship assessment.

Table 3.4.1 Rubrics of Internship for Continuous Internal Evaluation (CIE)

Assessment Criteria	Assessment Parameter	Excellent	Good	Average	Poor	Max Marks	Linked PO, PSO
Time & Involvement in Internship	Technical Knowledge & Application	Demonstrates excellent understanding and applies civil engineering concepts effectively to real-world problems (9–10)	Shows good understanding with minor gaps; applies concepts with some guidance (7–8)	Basic understanding with limited application in practical situations (4–6)	Poor understanding; unable to relate theory to practice (0–3)	10	PO1, PO2, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12, PSO1, PSO2
	Depth of Internship Work & Learning	Clearly explains tasks, methods, tools, and outcomes with strong insight	Adequate explanation with reasonable clarity and learning (7–8)	Superficial description; limited depth of learning (4–6)	Very limited explanation; little to no learning evident (0–3)	10	

Assessment Criteria	Assessment Parameter	Excellent	Good	Average	Poor	Max Marks	Linked PO, PSO
		and reflection (9–10)					
	Professional Behavior & Ethics	Demonstrates high ethical standards, discipline, and responsibility (5)	Generally ethical and professional with minor lapses (4)	Needs improvement in professionalism and ethical conduct (2–3)	Unprofessional attitude; lacks responsibility (0–1)	5	
Project Work & Skill Application	Presentation & Communication Skills	Highly confident, well-structured, and professional presentation (7–8)	Clear communication with minor issues (5–6)	Understandable but weak delivery and organization (3–4)	Poor communication; unclear and unstructured (0–2)	8	PO1, PO2, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12, PSO1

Assessment Criteria	Assessment Parameter	Excellent	Good	Average	Poor	Max Marks	Linked PO, PSO
	Analytical & Problem-Solving Skills	Excellent analysis, logical reasoning, and independent thinking (6–7)	Good analysis with some guidance (4–5)	Limited analysis; relies on guidance (2–3)	No analytical ability demonstrated (0–1)	7	PSO2
	Teamwork, Adaptability & Attitude	Excellent collaboration, adaptability, and initiative (5)	Good teamwork and adaptability (4)	Limited participation; struggles in team settings (2–3)	Poor teamwork; resistant to collaboration (0–1)	5	
	Analytical & Program ming Work with Completi on	Excellent work; punctual , committed, and accurate (5)	Good work with minor issues (4)	Average work; lacks consistency or completeness (2–3)	Unsatisfactory work; incomplete or poorly done (0–1)	5	

Table 3.4.2. Rubrics of Internship for the Semester End Evaluation (SEE)

Assessment Criteria	Assessment Parameter	Level 4 (Excellent)	Level 3 (Good)	Level 2 (Average)	Level 1 (Poor)	Max Marks	Linked PO & PSO
Internship Diary	Proper & Timely Documented Entries	Regular & timely (5)	Mostly regular (4)	Irregular (2–3)	Poor / missing (0–1)	5	PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12
	Adequacy & Quality of Information	Detailed & clear (5)	Adequate (4)	Limited (2–3)	Incomplete (0–1)	5	
Presentation	Communication & Presentation Skills	Highly confident & professional (6–7)	Good (5)	Average clarity (3–4)	Poor (0–2)	7	PO2, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12, PSO2
	Learning Experience & Reflection	Deep insights (6–7)	Good explanation (5)	Basic (3–4)	Very limited (0–2)	7	
	Attendance	Full attendance (6)	Minor absence (4–5)	Moderate absence (2–3)	Poor (0–1)	6	

Assessment Criteria	Assessment Parameter	Level 4 (Excellent)	Level 3 (Good)	Level 2 (Average)	Level 1 (Poor)	Max Marks	Linked PO & PSO
Report	Domain Knowledge & Skill	Excellent depth (5)	Good (4)	Basic (2–3)	Poor (0–1)	5	PO1, PO2, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PSO1
	Innovation / Creativity	Highly innovative (5)	Some creativity (4)	Limited (2–3)	None (0–1)	5	
	Planning & Organizational Skills	Well-structured (5)	Good (4)	Average (2–3)	Poor (0–1)	5	
	Report Format	Proper & complete (5)	Minor issues (4)	Inconsistent (2–3)	Poor (0–1)	5	

3.5	Evaluation of Projects	Claimed Marks (20)	Max Marks (20)
------------	-------------------------------	-----------------------------------	-------------------------------

1. Evaluation of Capstone Projects:

The programme has established well-defined rubrics for the assessment of final year projects. The Course Outcomes (COs) of the Project course are clearly articulated and mapped with the relevant Programme Outcomes (POs) and Programme Specific Outcomes (PSOs). Continuous Internal Evaluation (CIE) of project work is carried out through periodic reviews using structured assessment criteria and detailed rubrics aligned with each CO. At the end of each semester, external evaluation is carried out through a presentation/demonstration and Viva-Voce. The evaluation panel consists of an internal examiner and an external examiner appointed by the university, ensuring transparency, objectivity, and academic rigor in the assessment process. The evaluation process is illustrated in Figure 3.5.1 below. For the Capstone project, a total of six internal reviews are conducted throughout the year. Each semester includes three internal reviews, with one review scheduled every month.

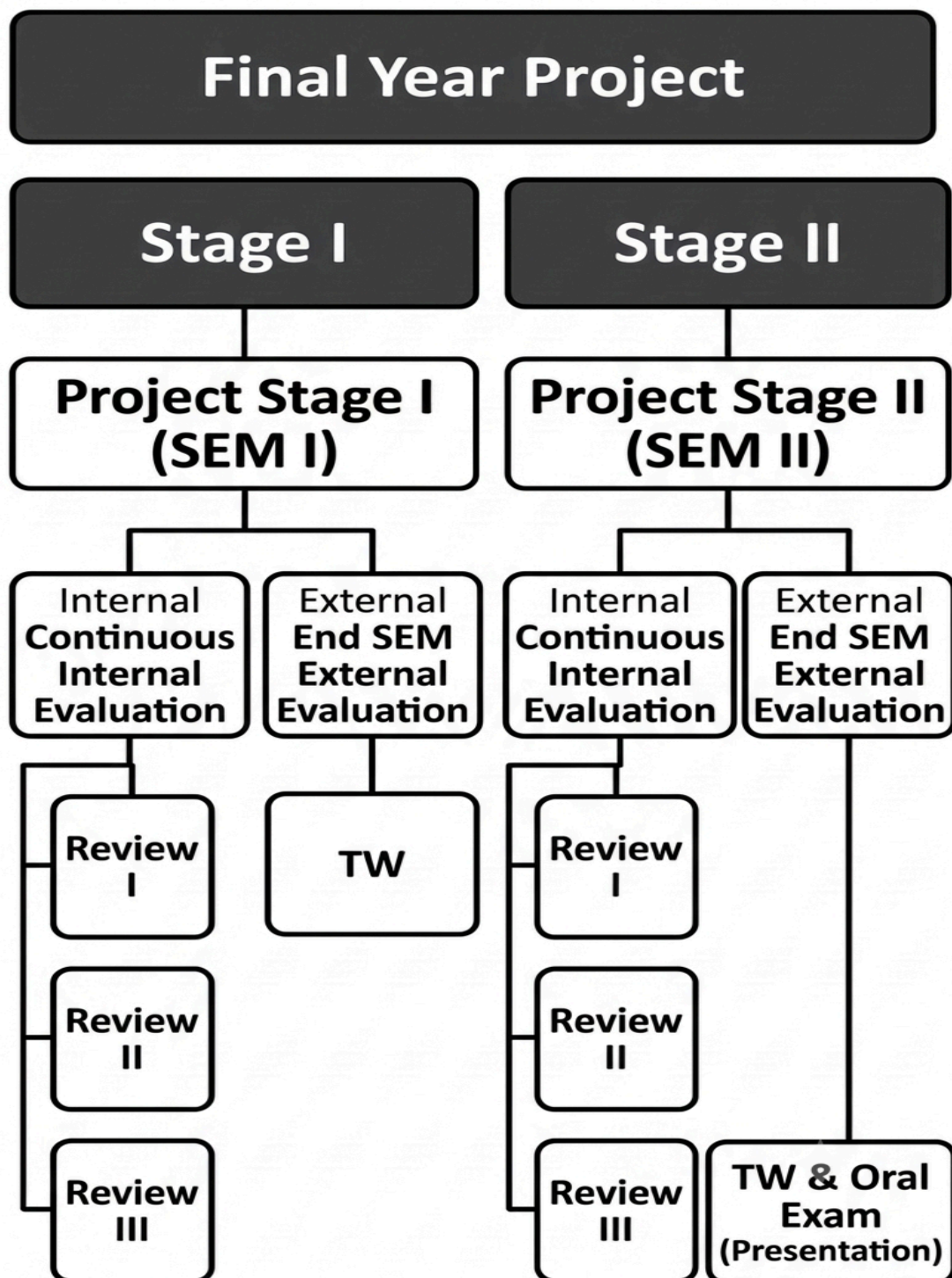


Figure 3.5.1 Final year project evaluation process

Internal assessment criteria are presented in Table 3.5.1. and 3.5.2.

Table 3.5.1 Assessment Criteria and Rubrics -I

Assessment Criteria	Assessment Parameters	Excellent	Good	Average	Poor	PO & PSO Mapping
Environment and Sustainability	Topic Selection (Complexity, Environmental Relevance & Sustainability)	Complete innovative and useful for society (5)	Somewhat innovative and useful (3–4)	Useful but not innovative (1–2)	Limited usefulness, not innovative (0)	(PO1, PO2, PO7, PO12, PSO2)
	Social, Environmental & Ethical Issues (Environmental Relevance & Sustainability, Ethics, Teamwork)	Identifies and effectively solves social, environmental & ethical issues (16–20)	Identifies and addresses any one/two issues effectively (11–15)	Identifies issues only, without proper resolution (6–10)	Unable to identify issues (0–5)	(PO6, PO7, PO9)
Complexity	Problem Definition (Complexity, Communication)	Exceeds expectation (5)	Extends beyond expectation (3–4)	Meets expectations (1–2)	Nearly meets expectations (0)	(PO1, PO2, PO10, PSO2)
	Literature Survey & Need of Project	Outstanding investigation in all	Well-researched, good depth (3–4)	Clear and structured research (1–2)	Minimal research (0)	(PO1, PO2, PO4, PSO2)

	(Complexity, Communication)	aspects (5)				
	Quality of Software Requirements / Specifications (Complexity, Communication)	Outstanding clarity of thought and documentation in developing design from specifications; models are appropriately selected and adapted (15–20)	Focus on specification with design derived appropriately using suitable techniques (10–14)	Design techniques used minimally but correctly on specification (5–9)	Very minimal analysis and unclear specification (0–4)	(PO3, PO2, PO10)
	Quality, Appropriateness and Accuracy of Design (Complexity, Project Management)	Excellent design covering all aspects of specification; fully appropriate with clear and logical thinking (15–20)	Appropriate, clear, and accurate design sufficient for implementation (10–14)	Limited design or weak linkage with specification/model (5–9)	Very minimal or poor design (0–4)	(PO1, PO3, PO5, PSO1, PSO2)

	Quality and Accuracy of Software System / Model (Complexity, Project Management)	Excellent design covering all aspects of the specification, fully appropriate to the project, showing clear thinking (20–25)	Appropriate design, clear and accurate, satisfactory for implementation (15–19)	Design not well related to specification or model (10–14)	Very minimal design (0–9)	(PO1, PO3, PO5, PO9, PSO1, PSO2)
	Paper Publication (Complexity, Communication)	Published in WoS / Scopus / UGC Care Journal (16–20)	Published in IEEE / Springer Conference (11–15)	Published in international journal/conference (6–10)	Not published / not submitted (0–5)	(PO1, PO4, PO10, PO12, PSO2)
Cost	Justification of Objectives & Planning (Project Management, Cost, Communication)	All objectives clearly defined (5)	Good justification (3–4)	Incomplete justification (1–2)	Limited information (0)	(PO1, PO3, PO10, PO11)

Table 3.5.2 Assessment Criteria and Rubrics -II

Assessment Criteria	Assessment Parameters	Excellent	Good	Average	Poor	PO & PSO Mapping
Teamwork	Project Scheduling & Work Distribution (Teamwork, Project Management)	Detailed scheduling with timelines (5)	Good scheduling (3–4)	Moderate scheduling (1–2)	Poor / no scheduling (0)	(PO9, PO11)
	Group / Individual Presentation (Communication, Teamwork)	Excellent presentation and demo; clear value of work; strong eye contact and confidence (9–10)	Good presentation with clear explanation (6–8)	Basic presentation with limited clarity (3–5)	Poor or no presentation; unclear communication (0–2)	(PO9, PO10)
Communication	Report Quality (Communication, Project	Outstanding, clear, well-structured, fully	Effective report with	Acceptable structure; some	Poor, unstructured report; unclear	(PO8, PO10, PO11)

	Management)	referenced report (9–10)	proper referencing (6–8)	clarity issues (3–5)	ideas (0–2)	
	System Demonstration (Complexity, Communication)	Fully integrated system; all objectives achieved (9–10)	Modules work with partial integration (6–8)	Modules work individually (3–5)	System failure; objectives not met (0–2)	(PO3, PO10, PSO1, PSO2)
	Results, Conclusion & Discussion (Communication)	Clear summary, strong conclusion, and future scope (9–10)	Good summary with future scope mentioned (6–8)	Basic summary; no future scope (3–5)	No proper conclusion (0–2)	(PO8, PO10, PSO2)
	Individual Presentation (Communication, Teamwork)	Excellentl y planned and executed presentation and demo; clear value of product (20–25)	Quality presentation; clear and concise explanation (15–19)	Basic presentation; explains learning (10–14)	No / poor presentation; unable to explain (0–9)	(PO9, PO10, PSO2)

Project management	Quality & Accuracy of Software System / Model (Complexity, Project Management)	Fully working, technically strong solution (9–10)	Well-engineered with proper methods (6–8)	Basic functional implementation (3–5)	Poor / incomplete implementation (0–2)	(PO3, PO5, PSO1)
	Testing Quality (Complexity, Project Management)	Full testing coverage with proper documentation (9–10)	Well-organized testing and documentation (6–8)	Basic testing and documentation (3–5)	Minimal or no testing (0–2)	(PO4, PO11)

2. Evaluation of Mini Project:

The mini-projects are assessed as a part of the laboratory assignment. Evaluation is carried out using well-defined rubrics that map Course Outcomes (COs) to relevant Program Outcomes (POs) and Program Specific Outcomes (PSOs). Continuous Internal Evaluation (CIE) is implemented through structured assessments conducted during the semester, ensuring systematic monitoring of student progress. The evaluation is based on predefined criteria covering various aspects of the project, and students are assessed periodically as part of their laboratory work using these rubrics. Table 3.5.3 shows rubrics for mini project assessment.

Table 3.5.3 Assessment Criteria and Rubrics for Mini Project

Assessment Criteria	Marks	Excellent	Good	Average	Poor	Relevance to PO/PSO
Problem Analysis & Implementation (Complexity)	4	Appropriate methodologies selected; complete and effective implementation (4)	Suitable methods; minor gaps (3)	Unclear methodology; incomplete implementation (2)	Poor/incorrect implementation (1)	(PO1, PO2, PO3, PO4, PO5, PSO1, PSO2)
Project Planning & Resource Management (Cost + Project management)	4	Accurate budget estimation; optimal resource use; well-planned execution (4)	Reasonable planning; minor inefficiencies (3)	Basic planning; limited resource management (2)	Poor planning; misuse of resources (1)	(PO11)

Environment & Societal Impact (Sustainability)	4	Strong eco-friendly design; minimal impact; high societal awareness (4)	Some environmental considerations (3)	Minimal sustainability focus (2)	No consideration of impact (1)	(PO6, PO7)
Teamwork & Participation	4	Active contribution; excellent coordination (4)	Good teamwork; minor issues (3)	Limited contribution; coordination issues (2)	Poor teamwork; no contribution (1)	(PO9)
Communication & Documentation	4	Well-structured report; clear and professional presentation (4)	Minor errors; adequate communication (3)	Basic report; average presentation (2)	Poor communication; unclear report (1)	(PO10)

3. Evaluation of Project-Based Learning (PBL) Project:

In Project-Based Learning (PBL), second-year student groups work on real-life, curriculum-oriented problems based on their interests, independently planning and implementing suitable solutions. Their performance is evaluated through progress reviews during the semester, where they present their work before a panel of faculty members. The marks obtained in all reviews are consolidated to determine the final term work evaluation. Table 3.5.4 shows assessment Criteria and rubrics for PBL project.

Table 3.5.4 Assessment Criteria and Rubrics for PBL Project

Assessment Criteria	Assessment Parameters	Marks	(Excellent)	(Good)	(Average)	(Poor)	PO & PSO Mapping
Environment and Sustainability	Problem Identification	4	Clearly defined, relevant & well-justified (4)	Minor ambiguity (3)	Partially defined (2)	Poor / unclear (1)	(PO1, PO2, PO7)
Complexity	Understanding of Topic / Knowledge Building	4	Excellent conceptual clarity (4)	Good understanding (3)	Basic understanding (2)	Poor understanding (1)	(PO1, PO12)
	Problem Solving Skill /	5	Fully functional	Minor issues (4)	Partially working (3)	Not properly implem	(PO3, PO5,

	Implementa tion		solution (5)			ented (1–2)	PSO 1)
Cost	Presentati on I (Project planning & Budgeting)	4	Accurate and detailed cost analysis (4)	Minor errors (3)	Incompl ete analysis (2)	Poor / missing (1)	(PO9 , PO1 0, PO11)
Teamwork	Presentati on II (Project Design)	5	Highly confiden t and professio nal (5)	Good presenta tion (4)	Average clarity (3)	Poor presenta tion (1–2)	(PO9 , PO1 0)
	Attendanc e	4	Full attendan ce (4)	Minor absence (3)	Moderat e absence (2)	Poor attendan ce (1)	(PO9)
	Participat ion in Technical Events	4	Active participa tion (4)	Good particip ation (3)	Limited particip ation (2)	No particip ation (1)	(PO9 , PO1 2, PSO 2)

Project Management	Abstract / Synopsis Submission	5	Well-written and timely (5)	Minor issues (4)	Incomplete (3)	Poor / not submitted (1–2)	(PO10, PO11)
	Demo of Working Model	4	Fully working model (4)	Minor issues (3)	Partially working (2)	Not working (1)	(PO3, PO5, PSO1)
Communication	Presentation III (Project Presentation)	4	Excellent communication (4)	Good presentation (3)	Average (2)	Poor (1)	(PO9, PO10)
	Explanation of Ideas & Information	3	Clear and logical explanation (3)	Partially clear (2)	Limited clarity (1)	Unclear / incomplete (0)	(PO10)
	Report Submission	4	Well-structured and timely (4)	Minor issues (3)	Incomplete (2)	Poor / not submitted (1)	(PO10, PO11)

3.6.	Evidence of Addressing Sustainable Development Goals (SDGs)	Claimed Marks (10)	Max Marks (10)
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Sustainable Development Goals (SDGs) are actively promoted by the department through a holistic approach to student development, integrating curriculum-based projects, co-curricular engagements and community-oriented initiatives. Students participate in activities such as hackathons (e.g., Student Innovation: Swadeshi for Atmanirbhar Bharat – Renewable & Sustainable Energy), contributions to social organizations, tree plantation drives, and similar initiatives, all aimed at fostering sustainability awareness and responsible citizenship.

In addition, the department organizes various student activities through professional bodies like IEEE, CSI, IEI, IKS, and NSS, aligned with the SDGs. These activities help improve students’ technical skills while also developing ethical values, social responsibility, and environmental awareness. Table 3.6.1 and Table 3.6.2 show how these activities are mapped to the SDGs.

Table 3.6.1 BE Project addressing SDGs

SN	Title of Project	Nature of SDG contribution	SDG’s Mapped
BE Project addressing SDGs in AY 2025-26			
1	Quantum Driven Deep Learning for Image Recognition	Promotes advanced research and innovation in AI and quantum computing technologies.	SDG 9, SDG 4
2	AI based Pot Hole Detection	Improves road safety and urban infrastructure through intelligent monitoring systems.	SDG 9,SDG 11

3	Federated Learning to Prevent Adversarial Attack	Enhances secure and reliable AI systems by protecting data privacy and model integrity.	SDG 16,SDG 9
4	Blockchain based Evaluate for Legal Documents	Ensures transparency, security, and trust in legal document verification systems.	SDG 16
5	Glaucoma Identification Using CNN Ensemble	Supports early disease detection and improves healthcare outcomes using AI.	SDG 3,SDG 9
6	Voice-Based Chatbot for Filing Complaints in Regional Language	Enables inclusive access to services by supporting regional language communication.	SDG 10
7	PII Detector Using Blockchain Technology	Strengthens data privacy and security by protecting sensitive personal information.	SDG 16
BE Project addressing SDGs in AY 2024-25			
1	Visualization And Comparative Simulation Of Pathfinding, Searching And Sorting Algorithms	Enhances computational learning and technical education	SDG 4, SDG 9
2	Traffic Management Using Artificial Intelligence	Improves smart transportation and urban planning	SDG 11, SDG 9
3	Pdf-Driven Chatbots: Revolutionizing Information Retrieval And User Interaction	Improves access to information and digital learning	SDG 4, SDG 9

4	Exploratory Analysis Of Geo-Locational Data	Supports smart city planning and data-driven decisions	SDG 9, SDG 11
5	Study And Analysis Of Computer Vision For Casualty Detection	Enhances emergency healthcare response systems	SDG 3
6	Smart Surveillance for Missing Child	Improves safety, security, and law enforcement	SDG 16, SDG 11
7	Review On Innovations In Early Detection And Preventive Strategies For Cardiovascular Health	Supports preventive healthcare and early diagnosis	SDG 3, SDG 9
BE project addressing SDGs in AY 2023-24			
1	GUI Based 6-Dof Robotic Arm For Radioactive Element Handling	Improves safety in hazardous environments	SDG 3, SDG 9, SDG 12
2	Stress Shield - A Police Stress Management Mobile Application	Promotes mental health support for professionals	SDG 3
3	GPT Chat for Biosciences	Enhances AI-based learning in biosciences	SDG 4, SDG 9
4	Ultra Cleaner: Automated data Cleaning Tool Using machine Learning, Which cleans Data Much Faster And accurately	Improves efficiency in data processing and analytics	SDG 9
5	SHA 512 Enhanced Secure Hash Decentralized Response System	Strengthens cybersecurity and secure communication	SDG 9
6	Advancements In Motorcycle Safety: Automatic Helmet	Enhances road safety and accident prevention	SDG 3

	Detection Systems Through Machine Learning		
7	Honeyword And Password Based Authentication System	Improves cybersecurity and data protection	SDG 9
8	Weapon Detection In Real-Time Cctv Videos Using CNN	Enhances public safety and surveillance systems	SDG 16
9	Anonymoface – A Real Time Face Anonymization Plugin	Protects privacy and digital identity	SDG 16
10	Virtual Invigilator System	Promotes fair and transparent online education	SDG 4
11	Recognipro: Recognition And Construction Of Forensic Facial Sketches	Supports criminal investigation and justice system	SDG 16
12	Compatible Code Editor	Enhances programming learning tools	SDG 4
BE project addressing SDGs in AY 2022-23			
1	Develop Model For Detection And Localization Of Brain Tumor	Supports medical diagnosis and healthcare	SDG 3
2	Soldier Health Monitoring (IoT)	Improves health monitoring using technology	SDG 3, SDG 9
3	College Commune Platform	Enhances communication and collaboration in education	SDG 4, SDG 9
4	COVID-19 Trend Prediction	Supports public health planning and response	SDG 3
5	NLP-based GATE Prep App	Improves access to	SDG 4

		quality education	
6	Drug Pill Recognition System	Enhances healthcare accuracy and patient safety	SDG 3
7	PMPML Bus Tracking System	Improves public transport efficiency	SDG 11, SDG 9
8	Blockchain Secure Communication	Strengthens secure digital communication	SDG 9
9	Online Auction System	Supports digital economy and business innovation	SDG 9
10	Underwater Target Detection	Supports marine ecosystem monitoring	SDG 14
11	Object Detection for Blind People	Enhances accessibility and inclusivity	SDG 10
12	E-Recruitment System	Supports employment and digital hiring systems	SDG 8, SDG 9

Table 3.6.2 Students Activity addressing SDG

Sr. No.	Academic Year	Name of Activity	Nature of SDG contribution	SDG's Mapped
1.	2025-26	Industrial Visit to Giant Metrewave Radio Telescope (GMRT), Khodad	Enhances practical scientific knowledge and promotes experiential learning in advanced	SDG 4
2	2025-26	School visit for Environmental awareness campaign	Promotes awareness and responsible behavior toward	SDG 13

Sr. No.	Academic Year	Name of Activity	Nature of SDG contribution	SDG's Mapped
			environmental protection and climate sustainability.	
3	2025-26	Celebration of Marathi Gaurav Din	Preserves cultural heritage and strengthens community identity and inclusiveness.	SDG 11
4	2025-26	Poster Competition on "Why Environmental Study Matters for Technologists"	Encourages sustainable thinking and eco-friendly practices among future technologists.	SDG 12
5	2025-26	Field Visit to Chaitanya Institute for Mental Health	Promotes mental health awareness and well-being	SDG 3
6	2025-26	IEEE Membership Drives	Encourages professional development and quality education	SDG 4
7	2025-26	Field2Frame Documentary Challenge	Enhances research, creativity, and communication skills	SDG 4
8	2025-26	IEEE Day Event	Promotes student engagement and technical	SDG 4

Sr. No.	Academic Year	Name of Activity	Nature of SDG contribution	SDG's Mapped
			awareness	
9	2025-26	Study Visit to RESQ Charitable Trust	Supports wildlife conservation and biodiversity awareness	SDG 15
10	2025-26	Inv.Ent Pitch Competition	Encourages innovation and entrepreneurship	SDG 8
11	2025-26	Research Visit to Grasslands Trust	Promotes environmental sustainability	SDG 15
12	2025-26	Research Quest Competition	Develops research and analytical skills	SDG 4
13	2025-26	IEEE Student Branch Inauguration	Promotes academic growth and innovation	SDG 4
14	2025-26,2024-25,2023-24,2022-23	Techno-Sci Events (CSI/IEI)	Encourages technical education and innovation	SDG 4
15	2024-25	AI Deepfake Recognition: AI based System to Accurately and Efficiently Detect Deepfake Content(Internal SIH)	Ensures digital security by detecting fake content and preventing misinformation.	SDG 16
16	2024-25	Student Innovation: Swadeshi for Atmanirbhar Bharat -	Promotes clean energy and	SDG 7, SDG 9

Sr. No.	Academic Year	Name of Activity	Nature of SDG contribution	SDG's Mapped
		Renewable & Sustainable Energy(Internal SIH)	supports innovation in sustainable technologies.	
17	2024-25	AQUASYN is an AI-powered platform designed to make sense of the vast and scattered information about marine life(Internal SIH)	Enhances marine conservation through data-driven insights.	SDG 13, SDG 14
18	2024-25	Cyber Shield: AI & Blockchain Powered Incident and Safety Portal(Internal SIH)	Improves cybersecurity and ensures safe digital systems.	SDG 16
19	2024-25	Smart Alumni Connect: A Centralized Data & Engagement Platform(Internal SIH)	Strengthens education and collaboration through alumni networking.	SDG 4,SDG17
20	2024-25	Parking Space Shortage in the Era of Rapid Vehicle Growth(Internal SIH)	Optimizes urban parking to reduce congestion and improve city planning.	SDG 11
21	2024-25	Krishi Sakhi: AI-powered Voice First Personal Farming Assistant for Kerala smallholders(Internal SIH)	Supports farmers with AI guidance to improve productivity and income.	SDG 2 SDG 8

Sr. No.	Academic Year	Name of Activity	Nature of SDG contribution	SDG's Mapped
22	2024-25	GreenQuest – Gamified Environmental Learning Platform(Internal SIH)	Promotes environmental awareness through interactive learning.	SDG 4 SDG 13
23	2024-25	AI Automated Social Media Manager(Internal SIH)	Enhances digital innovation through automated content management.	SDG 9
24	2024-25	Indian Heritage Art Contest (IKS)	Promotes cultural awareness and education	SDG 4
25	2024-25	Martial Arts Fitness Workshop (IKS)	Promotes physical fitness and well-being	SDG 3
26	2024-25	NSS Special Residential Camp	Community development, sanitation, and social responsibility	SDG 3, SDG 4, SDG 6,SDG 11, SDG 17
27	2024-25	Grocery Donation Activities	Supports poverty reduction and food security	SDG 1,SDG 2,SDG 10, SDG 17
28	2023-24	Women's Day Activities	Promotes gender equality and social	SDG 4, SDG 5, SDG 10

Sr. No.	Academic Year	Name of Activity	Nature of SDG contribution	SDG's Mapped
			awareness	
29	2023-224	Engineer's Day Celebration	Promotes engineering awareness	SDG 4
30	2023-24	Blood Donation Camp	Promotes healthcare and well-being	SDG 3,SDG 17
31	2022-23	Tree Plantation Drives	Supports environmental sustainability and climate action	SDG 13, SDG 15
32	2022-23	Engineers Day (IEI Activities)	Promotes technical knowledge and professional awareness	SDG 4
33	2022-23	Ideation Competition (IEI)	Encourages creativity and innovation	SDG 4
34	2022-23	Swachhta Abhiyan	Promotes sanitation and sustainable communities	SDG 6,SDG 11, SDG 12, SDG 14
35	2022-23	Republic Day Celebration	Promotes civic awareness and social responsibility	SDG 4,SDG 16
36	2022-23	Har Ghar Tiranga Initiative	Encourages national awareness and unity	SDG 4, SDG 16

Sr. No.	Academic Year	Name of Activity	Nature of SDG contribution	SDG's Mapped
37	2022-23	One Day Workshop On Human Rights, Indian Judiciary System and The constitution of India On occasion of National Service Scheme (NSS) Day	Promotes justice, rights awareness, and education	SDG 4, SDG 16
38	2022-23	NGO & School Donation Visits	Supports social equality and community welfare	SDG 1,SDG 2, SDG 10
39	2022-23	Yoga Day Activity	Promotes physical and mental health	SDG 3, SDG 4

3.7 Attainment of Course Outcomes (25)

3.7.1	Describe the Assessment Tools and Processes Used to Gather the Data for the Evaluation of Course Outcome	Claimed Marks (05)	Max Marks (05)
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The attainment of Course Outcomes (COs) is evaluated through a structured Outcome-Based Education (OBE) assessment framework. The assessment system integrates direct and indirect methods to measure student learning comprehensively. Direct assessments measure students' actual performance in examinations, assignments, and laboratory work, whereas indirect assessments capture students' perception of learning through feedback mechanisms. All assessment tools are mapped to specific COs and Bloom's Taxonomy levels before the semester commences. Continuous Internal Evaluation (CIE) is carried out throughout the semester to assess progressive learning. Performance data is collected, verified, compiled CO-wise and analyzed against predefined attainment targets to determine the level of CO attainment and support continuous improvement.

A. List of Assessment Tools and Processes

The Department evaluates CO attainment through a well-defined OBE process implemented and documented in course files. The assessment tools and their evaluation processes are as below shown in table 3.7.1.1.

Table 3.7.1.1 List of Assessment Tools

S. No.	Assessment Tool	Description / Evaluation Process
Direct Attainment Tools – Internal (CIE)	Unit Tests	Generally, two unit tests are conducted separately for the first two units and the last two units, respectively. The unit test answer sheets are evaluated, and the same, along with model answers, are shown to the students by the course teacher.

	Assignments / Case Studies	Assignments/Case studies are given to evaluate students' ability to apply concepts and analyze real-world problems.
	Quizzes	Quizzes are conducted to assess students' understanding of the subject through short, structured evaluations.
	Laboratory Work	Laboratory Work is assessed by using rubrics that cover procedure, observation, analysis, interpretation, and understanding. The marks are given under the Term Work
Direct Attainment Tools – External (SEE)	Semester End Examination (SEE) – Theory	The university conducts the SEE. For the 2019 pattern, the End-semester examination is conducted on the last four units, while the In-semester examination is conducted on the first two units. For the 2024 pattern, the SEE is conducted on all units as the End-semester examination.
	Semester End Examination (SEE) – Oral/Practical/ Term Work	The university conducts the SEE Evaluation of Laboratory Works in the form of oral / practical / term work examination.
Indirect Attainment	Course End Survey (CES)	Each course teacher conducts the course end survey at the end of the semester to collect student feedback on perceived attainment of COs. The CO-wise responses are averaged and used for indirect course attainment.

Data Collection Process: The data collection process for course outcome assessment is systematically designed at the course level. Initially, course-wise assessment planning is carried out, ensuring alignment of assessment components with defined Course Outcomes (COs). Assessments are then conducted through Continuous Internal Evaluation (CIE) and Semester End Examination (SEE). Student performance data is recorded in a structured manner based on CO-wise

mapping of assessment components. The recorded data is subsequently verified to ensure accuracy and consistency. After verification, CO-wise compilation of data is carried out, which forms the basis for further computation of CO attainment. The process is shown in Figure 3.7.1.1.

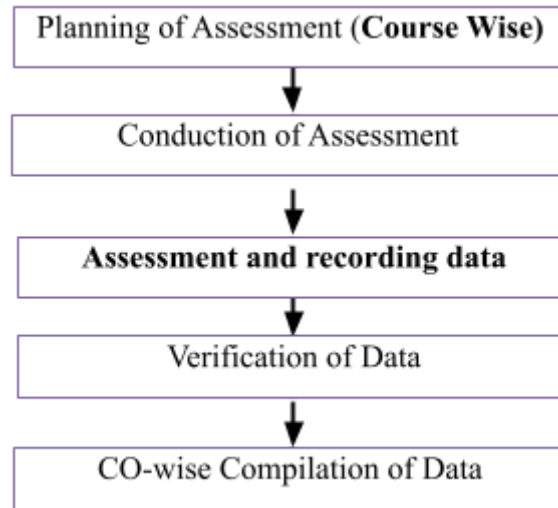


Figure 3.7.1.1 Data Collection Process

Assessment Process: The CO evaluation follows a systematic four-stage process as given below:

- **Data Collection:** Marks from all mapped assessment components are recorded CO-wise.
- **Verification:** The recorded data is verified for completeness, accuracy and correctness of CO-wise mapping.
- **Compilation & Attainment Calculation:** Marks are aggregated CO-wise based on mapping, and attainment levels are computed using predefined thresholds.
- **Analysis & Decision:** Attainment levels are compared with set targets, gaps are identified and appropriate corrective actions are planned and implemented for continuous improvement.

B. Quality and Relevance of Assessment Tools/Processes

The assessment framework ensures quality and relevance through alignment with the OBE philosophy:

- **Alignment with Course Outcomes:** All assessment tools are mapped to specific COs to ensure measurement of intended Course Outcomes.
- **Bloom's Taxonomy Integration:** Questions are designed to assess different cognitive levels, such as understanding, application and analysis.
- **CO Mapping of Assessments:** Each question in tests and assignments is mapped to COs for accurate performance measurement.
- **Defined Attainment Criteria:** Predefined threshold values and attainment levels are used to determine the degree of CO attainment.
- **Use of Multiple Assessment Methods:** A combination of written examinations, assignments, laboratory work, and presentations ensures comprehensive evaluation of learning.
- **Continuous and Indirect Assessment:** Continuous Internal Evaluation monitors student progress, while the Course End Survey provides indirect feedback on CO attainment.

This well-structured and transparent approach ensures a reliable and valid assessment process, effectively measuring Course Outcome attainment and promoting continuous improvement in teaching and learning.

3.7.2	Record the Attainment of Course Outcomes of all Courses with Respect to Set Attainment Levels	Claimed Marks (20)	Max Marks (20)
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Methodology to define levels, data collection, verification, analysis, and decision-making

The institute adopts a systematic, outcome-based approach to measure the attainment of Course Outcomes (COs), Program Outcomes (POs), and Program-Specific Outcomes (PSOs). Each course defines 4–6 COs, which are mapped to relevant POs and PSOs using a three-level correlation scale (3–Substantial, 2–Moderate, 1–Slight). This CO–PO–PSO mapping is recorded in the articulation matrix and maintained in the course file. Table 3.7.2.1 presents the threshold criteria and attainment levels for CO attainment.

Table 3.7.2.1 Threshold Definition and Attainment Levels

Assessment Type	Assessment Tool	Threshold Definition	Attainment Levels
Internal Assessment & External Assessment	Unit Tests, Assignments, Quizzes, Term Work, In-Sem, End-Sem, Oral, Practical	For old course: Average percentage of End SEM marks obtained by students in the last three academic years For new course: 50% marks (minimum acceptable level; may be increased for easy courses)	Level 1: $\geq 50\%$ students above threshold Level 2: $\geq 60\%$ students above threshold Level 3: $\geq 70\%$ students above threshold

A. Data Collection and Verification

Data for attainment calculation is collected from both theory and practical assessment components. All assessments, including unit tests, assignments, quizzes, practical exams, and end-semester examinations, are mapped to the respective Course Outcomes (COs) before evaluation. Marks are recorded CO-wise based on question mapping and evaluation rubrics. Direct assessment data is obtained from internal and external examinations, while indirect data is gathered through course-end surveys. The recorded data is verified at multiple levels, including by the course teacher and the department, to ensure accuracy in CO mapping and mark entry. All supporting documents, such as question papers, CO-mapping sheets, evaluated answer sheets, mark sheets, and survey reports, are maintained in the course file for validation and audit purposes.

B. CO Attainment

Course Outcome (CO) attainment is calculated as per the process shown in Figure 3.7.2.1. CO attainment has two main parameters: **direct attainment and indirect attainment**. The contribution of direct and indirect assessment components varies across courses depending on their nature, and appropriate weightages are considered during the computation of CO attainment.

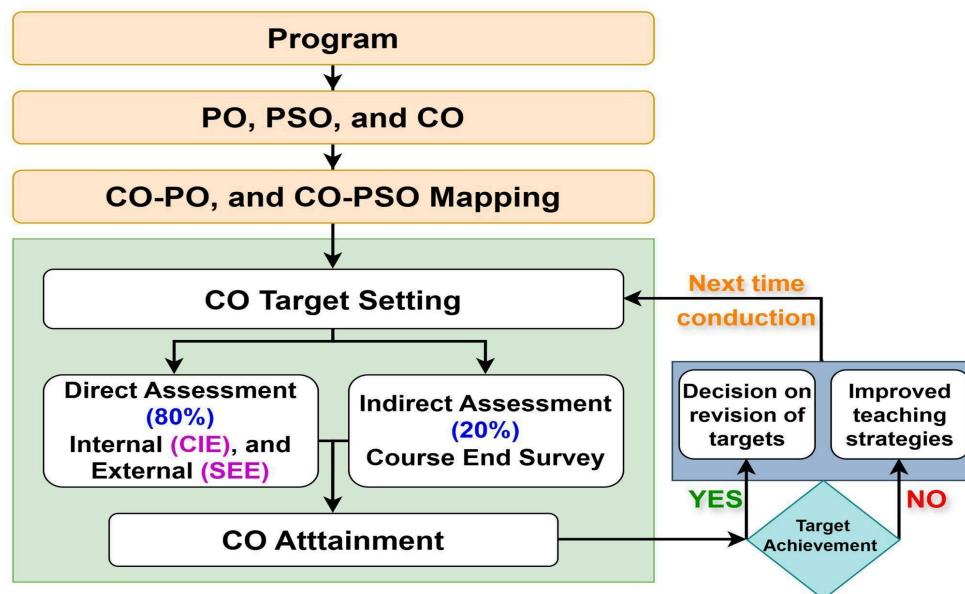


Figure 3.7.2.1 Process of CO attainment

Generally, the weightage of direct and indirect assessment is taken as 80:20.
So,

$$\text{CO Attainment: } 0.80 \times \text{direct attainment} + 0.20 \times \text{indirect attainment}$$

C. Calculation of Overall PO and PSO Attainment

Direct attainment of POs and PSOs is computed from CO attainment using the CO-PO-PSO attainment matrix, where correlation levels (1-slight, 2-moderate, 3-substantial) are applied to determine each CO's contribution and aggregated across courses. Indirect attainment is obtained through Program Exit, Alumni, and Employer Surveys reflecting stakeholders' perceptions. The final PO and PSO attainment is calculated by combining 80% direct attainment and 20% indirect attainment, as shown in Figure 3.7.2.2.

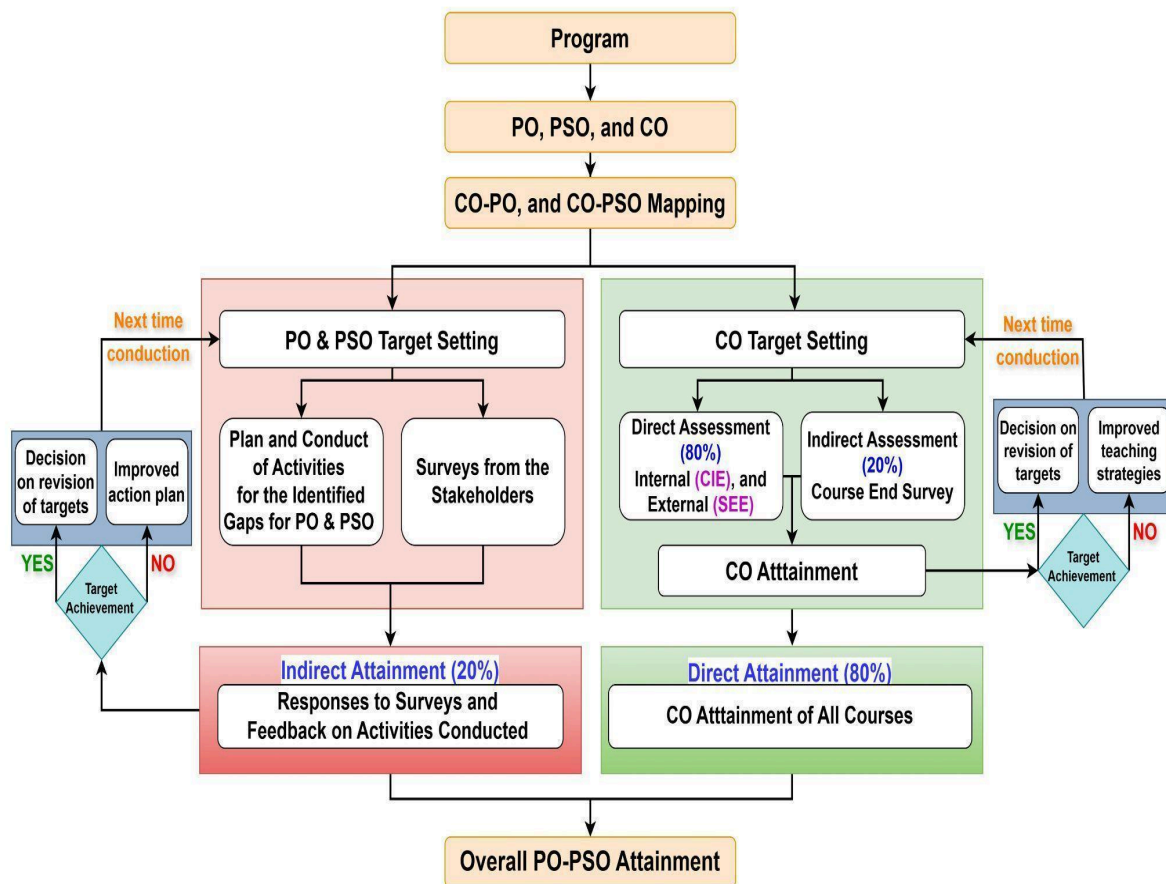


Figure 3.7.2.2 Process for Calculation of Overall Attainment

D. Decision making and Continuous Quality Improvement (CQI)

The attainment values are compared with the predefined targets. If any CO is not achieved, corrective measures such as improving teaching methods, providing additional practice, or revising assessment strategies are implemented. When a CO target is fully attained (100%), the target is increased by 5% in the following academic years to encourage continuous improvement. Initially, the CO target for a course is set at 60% (1.8), and in subsequent years, it is reviewed based on actual attainment. A CO is considered attained if the calculated value is greater than or equal to 85% of the set target. Table 3.7.2.1 presents the record of CO attainment for LYG 2024–25.

Table 3.7.2.1 Record of CO Attainment

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
Design and Analysis of Algorithms	410241	410241.1	Analyze algorithms for computational problems by applying appropriate problem-solving strategies	1.89	2.52	Y
		410241.2	Analyze the asymptotic performance of algorithms	1.89	2.52	Y
		410241.3	Decide and apply algorithmic strategies to solve given problem	1.98	2.52	Y
		410241.4	Demonstrate optimal or near-optimal solutions by employing and comparing multiple algorithmic techniques	1.98	2.52	Y
		410241.5	Analyze and Apply Scheduling and Sorting Algorithms	1.98	2.84	Y
		410241.6	Solve problems for multi-core or distributed or concurrent environments	1.98	2.84	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
Machine Learning	41024 2	41024 2.1	Discuss the need, scope, and challenges of machine learning for real-world applications.	1.89	2.52	Y
		41024 2.2	Apply appropriate data preprocessing, feature extraction, and feature selection techniques to optimize datasets for efficient machine learning models.	1.89	2.52	Y
		41024 2.3	Determine suitable supervised learning regression algorithm for real-time problems	1.89	2.68	Y
		41024 2.4	Describe binary and multi-class classification algorithms using appropriate metrics for balanced and imbalanced datasets.	1.89	3	Y
		41024 2.5	Analyze different clustering and outlier detection algorithms using suitable intrinsic and extrinsic evaluation methods.	1.89	2.52	Y
		41024 2.6	Interpret the functioning of neural network models in real-world engineering contexts	1.89	2.52	Y
410243: Blockchain Technology	41024 3	41024 3.1	Interpret fundamentals and basic concepts of Blockchain.	1.98	3.00	Y
		41024 3.2	Describe different blockchain platforms and consensus mechanisms.	1.98	2.68	Y
		41024 3.3	Apply crypto wallets to perform cryptocurrency-based transactions.	1.98	3.00	Y
		41024 3.4	Describe blockchain-based solutions for real-world problems.	1.98	3.00	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		41024 3.5	Interpret smart contracts on Ethereum using Solidity tools/platform.	1.98	2.84	Y
		41024 3.6	Discuss application domains where blockchain technology can be effectively deployed.	1.98	2.84	Y
410246: Laboratory Practice III	41024 6	41024 6.1	Apply data preprocessing techniques on datasets.	1.98	2.80	Y
		41024 6.2	Evaluate regression models using linear and random forest regression.	1.98	2.79	Y
		41024 6.3	Evaluate classification and clustering techniques.	1.98	2.79	Y
		41024 6.4	Analyze algorithm performance using time and space complexity.	1.98	2.77	Y
		41024 6.5	Implement algorithms using algorithm design strategies.	1.98	2.64	Y
		41024 6.6	Interpret basic concepts of Blockchain technology and its applications.	1.98	2.64	Y
410247: Laboratory Practice IV	41024 7	41024 7.1	Apply android application development for solving real life problems	1.89	2.35	Y
		41024 7.2	Design and develop system using various multimedia components.	1.89	2.30	Y
		41024 7.3	Identify various vulnerabilities and demonstrate using various tools.	1.89	2.20	Y
		41024 7.4	Execute information retrieval tools for natural language processing	1.89	2.10	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		41024 7.5	Develop an application using open source GPU programming languages	1.89	1.93	Y
		41024 7.6	Formulate software testing tools to perform automated testing	1.89	2.00	Y
410248: Project Work Stage I	41024 8	41024 8.1	Analyze a real-world engineering problem through a comprehensive literature survey to clearly define the problem scope, objectives, and constraints.	1.98	2	Y
		41024 8.2	Analyze existing solutions and technologies to formulate system requirements and feasibility, considering technical, economic, and societal factors.	1.98	2	Y
		41024 8.3	Design an appropriate system architecture and methodological framework, including selection of tools, platforms, and algorithms for the proposed solution	1.98	2	Y
		41024 8.4	Create a complete project proposal and preliminary system model, and communicate the design effectively through technical documentation and presentations.	1.98	2	Y
410250: High Performance Computing	41025 0	41025 0.1	Describe parallel computing paradigms, architectures, and programming models used in high-performance computing systems.	1.98	2.20	Y
		41025 0.2	Investigate efficient parallel algorithms for solving computational problems using	1.89	1.24	N

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			appropriate decomposition and scheduling techniques.			
		41025 0.3	Illustrate data communication and synchronization operations on shared-memory and distributed-memory parallel architectures.	1.80	2.52	Y
		41025 0.4	Analyze the performance of parallel algorithms using standard metrics such as speedup, efficiency, scalability, and cost.	1.80	2.52	Y
		41025 0.5	Apply CUDA architecture for parallel programming	1.80	2.68	Y
		41025 0.6	Analyze the performance of HPC applications on modern parallel systems and recommend optimizations based on profiling results.	1.80	2.68	Y
410251: Deep Learning	41025 1	41025 1.1	Investigate tools to implement deep learning applications like TensorFlow, Keras, PyTorch, Caffe, Shogun.	1.98	3	Y
		41025 1.2	Apply the performance of deep learning models	1.98	3	Y
		41025 1.3	Analyze deep neural network architectures by using appropriate hyperparameters and architectural principles	1.98	3	Y
		41025 1.4	Demonstrate the technique of Convolution (CNN) and Recurrent Neural Network (RNN) for	1.98	3	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			implementing Deep Learning models			
		41025 1.5	Implement and apply deep generative models.	1.98	3	Y
		41025 1.6	Design policy for reinforcement learning algorithms	1.98	3	Y
410254: Laboratory Practice-V	41025 4	41025 4.1	Evaluate the performance of parallel searching and sorting algorithms.	1.98	2.65	Y
		41025 4.2	Implement a parallel program using the CUDA environment.	1.98	2.65	Y
		41025 4.3	Apply the suitable algorithms to solve AI/ML problems.	1.98	2.65	Y
		41025 4.4	Implement Linear regression and classification using the technique of Deep Neural network	1.98	2.65	Y
		41025 4.5	Design and develop Deep Learning models using the technique of Convolution (CNN)	1.98	2.65	Y
		41025 4.6	Design and develop Recurrent Neural Network (RNN) for prediction.	1.98	2.52	Y
410255: Laboratory Practice-VI	41025 5	41025 5.1	Apply basic principles of elective subjects for problem solving and modeling.	1.98	2.06	Y
		41025 5.2	Apply appropriate tools and techniques in the area of software development to build mini projects	1.98	2.06	Y
		41025 5.3	Design and develop applications on subjects of their elective choice	1.98	2.06	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		41025 5.4	Deploy and configure administration & security of applications in practical environments.	1.98	2.06	Y
410244 D Elective -I : Object- Oriented Modelin g and Design	41024 4D	41024 4D.1	Analyze the concepts of object-oriented and basic class modelling.	1.98	3	Y
		41024 4D.2	Describe class diagrams, sequence diagrams and interaction diagrams to solve problems.	1.98	3	Y
		41024 4D.3	Apply signal generalization to organize events into parent-child relationships, allowing for polymorphic event handling through inheritance.	1.89	2.36	Y
		41024 4D.4	Analyze applications, architectural Styles & software control strategies	1.89	2.36	Y
		41024 4D.5	Translate end-user requirements into high-level system designs using the UML	1.89	2.36	Y
		41024 4D.6	Design Class design Models & choose Legacy Systems for real time applications.	1.89	2.36	Y
410245C Elective -II: Mobile Computi ng	41024 5C	41024 5C.1	Develop a strong grounding in the fundamentals of mobile Networks	1.89	3.00	Y
		41024 5C.2	Apply knowledge in MAC, Network, and Transport Layer protocols of Wireless Network	1.89	3.00	Y
		41024 5C.3	Illustrate Global System for Mobile Communications	1.89	2.68	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		41024 5C.4	Use the 3G/4G technology based network with bandwidth capacity planning, VLR and HLR identification algorithms	1.89	2.68	Y
		41024 5C.5	Classify network and transport layer of mobile communication	1.89	2.84	Y
		41024 5C.6	Design & development of various wireless network protocols using simulation tools	1.89	2.84	Y
410245 D Elective –II: STQA	41024 5D	41024 5D.1	Summarize fundamental concepts in software testing such as manual testing, automation testing and software quality assurance	1.80	2.52	Y
		41024 5D.2	Model project test plan, design test cases, test data, and conduct test operations	1.80	2.52	Y
		41024 5D.3	Apply recent automation tool for various software testing for testing software	1.80	1.24	N
		41024 5D.4	Synthesize fundamental concepts of Selenium IDE, Selenium RC, Selenium Web driver, Selenium Grid.	1.80	1.24	N
		41024 5D.5	Apply different approaches of quality management, assurance, and quality standard to software system	1.80	1.24	N
		41024 5D.6	Apply and Analyze effectiveness Software Quality Tools	1.80	1.24	N
410252C Elective V-	41025 2C	41025 2C.1	Interpret the need of Software Defined networking solutions	1.89	3.00	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
Software Defined Network		41025 2C.2	Analyze different methodologies for sustainable Software Defined Networking solutions	1.89	3.00	Y
		41025 2C.3	Select best practices for design, deployment and troubleshooting of next generation networks.	1.89	3.00	Y
		41025 2C.4	Develop programmability of network elements.	1.89	3.00	Y
		41025 2C.5	Demonstrate virtualization and SDN Controllers using Open Flow protocol	1.89	3.00	Y
		41025 2C.6	Design and develop various applications of SDN	1.89	3.00	Y
410252 A Elective V- Natural Language Processing	41025 2A	41025 2A.1	Describe the fundamental concepts of NLP, challenges and issues in NLP	1.98	3	Y
		41025 2A.2	Analyze Natural languages morphologically, syntactically and semantically	1.98	2.84	Y
		41025 2A.3	Explain and apply various language modeling techniques for NLP tasks.	1.98	3	Y
		41025 2A.4	Explain the NLP techniques for the information retrieval task	1.98	3	Y
		41025 2A.5	Apply Natural Language Processing (NLP) tools and techniques for text-based processing of natural language data.	1.98	2.52	Y
		41025 2A.6	Select appropriate machine translation techniques for real-world NLP applications.	1.98	2.52	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
410253C Elective VI-Business Intelligence	410253C	410253C.1	Differentiate between the concepts, components, and functionalities of Decision Support Systems (DSS) and Business Intelligence (BI).	1.98	2.52	Y
		410253C.2	Design a Business Intelligence system using Data Warehouse concepts and Business Architecture principles	1.98	2.52	Y
		410253C.3	Design and present interactive dashboards and graphical reports using BI visualization tools	1.98	2.52	Y
		410253C.4	Apply various data pre-processing techniques such as cleaning, transformation, and normalization on real-world datasets.	1.98	2.52	Y
		410253C.5	Implement suitable machine learning algorithms to solve business problems based on organizational requirements.	1.98	2.52	Y
		410253C.6	Analyse the role and impact of Business Intelligence in marketing, logistics, finance, and telecommunication sectors.	1.98	2.52	Y
410253A Elective VI-Pattern Recognition	410253A	410253A.1	Analyze pattern recognition techniques and their applicability to different problem domains.	1.98	2.84	Y
		410253A.2	Identify and apply suitable pattern recognition and classification approaches to solve real-world problems.	1.98	2.52	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		41025 3A.3	Evaluate statistical and structural pattern recognition methods for performance and accuracy.	1.98	3	Y
		41025 3A.4	Examine recent advances in pattern recognition and relate them to emerging applications.	1.98	3	Y
		41025 3A.5	Implement Bellman's optimality principle and dynamic programming to design optimal solutions.	1.98	3	Y
		41025 3A.6	Apply Genetic Algorithms for pattern recognition problems and practical applications.	1.98	3	Y
410256: Project Stage-II	41025 6	41025 6.1	Implement the proposed system using appropriate tools and practices	1.98	3	Y
		41025 6.2	Analyze and evaluate system performance using experimental results	1.98	3	Y
		41025 6.3	Develop a complete, functional, and deployable solution	1.98	3	Y
		41025 6.4	Evaluate outcomes and communicate results through final documentation and defense	1.98	3	Y
310241: Database Management Systems	31024 1	31024 1.1	Discuss the fundamentals of Database Management Systems, including their purpose, applications, data abstraction, database languages, system architecture, and data models	1.98	2.84	Y
		31024 1.2	Apply SQL commands to create, modify, and manipulate database	1.98	2.68	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			objects using DDL, DML, DCL, and TCL statements			
		31024 1.3	Design well-structured relational schemas using CODD's Rules	1.98	2.04	Y
		31024 1.4	Analyze concurrency control techniques such as locking protocols, timestamp-based methods, and deadlock handling to ensure database consistency	1.98	1.88	Y
		31024 1.5	Differentiate between various NoSQL data models such as key-value, document, column-family, and graph databases.	1.98	2.2	Y
		31024 1.6	Describe the emerging databases ,Complex Data Types & Query Processing	1.98	2.2	Y
310242: Theory of Computation	31024 2	31024 2.1	Apply the concepts of formal languages, alphabets, and translation logic to construct and minimize Finite Automata (DFA, NFA, ϵ -NFA) and their variants.	1.89	2.59	Y
		31024 2.2	Analyze regular languages using Regular Expressions, Pumping Lemma, closure properties, and equivalence theorems to validate language behavior.	1.89	2.60	Y
		31024 2.3	Design and simplify Context Free Grammars (CFGs) and analyze derivation and parse trees to identify ambiguity and normal forms.	1.89	2.27	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		31024 2.4	Apply and analyze Pushdown Automata (PDA) models to recognize Context Free Languages and establish equivalence between PDA and CFG.	1.89	2.28	Y
		31024 2.5	Design and evaluate Turing Machines for computational problems and assess their limitations, variants, and decidability characteristics.	1.89	1.78	N
		31024 2.6	Analyze and evaluate computational problems to classify them into complexity classes (P, NP, NP-Complete, Undecidable) and justify their computational feasibility.	1.89	1.77	N
310243: Systems Programming and Operating System	31024 3	31024 3.1	Synthesize basic System Software and its functionality.	1.89	2.52	Y
		31024 3.2	Recognize appropriate data structures and devise and execute diverse system software	1.89	2.52	Y
		31024 3.3	Analyze the performance of linker and loader by comparing different loading schemes	1.89	1.40	N
		31024 3.4	Analyze the performance of process scheduling algorithms	1.89	1.40	N
		31024 3.5	Identify the mechanism to deal with deadlock and concurrency issues	1.89	1.24	N
		31024 3.6	Demonstrate memory organization and memory management policies	1.89	1.24	N

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
310244: Computer Networks and Security	310244	310244.1	Explain fundamental concepts of computer networks, including types, models, architectures, devices, and transmission techniques	1.98	3	Y
		310244.2	illustrate the working and functions of the Data Link Layer	1.98	3	Y
		310244.3	Analyze the working of different routing protocols and mechanisms	1.89	3	Y
		310244.4	Implement client-server applications using sockets	1.89	3	Y
		310244.5	Explain the services and protocols of the Application Layer including HTTP, DNS, Email, FTP, TELNET, DHCP, and SNMP.	1.89	3	Y
		310244.6	Describe the basics of network security, including services, principles, threats, vulnerabilities, cryptographic techniques, and mechanisms.	1.89	3	Y
310246: Database Management Systems Laboratory	310246	310246.1	Design E-R Model for given requirements and convert the same into database tables	1.98	2.67	Y
		310246.2	Design schema in appropriate normal form considering actual requirements	1.98	2.27	Y
		310246.3	Implement SQL queries for given requirements , using different SQL concepts	1.98	2.73	Y
		310246.4	Implement PL/SQL Code block for given requirements	1.98	2.74	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		31024 6.5	Implement NoSQL queries using MongoDB	1.98	2.72	Y
		31024 6.6	Design and develop Application considering actual requirements and using Database concepts	1.98	2.7	Y
310247: Computer Networks and Security Laboratory	31024 7	31024 7.1	Analyze computer networks, architectures, protocols and technologies	1.98	2.72	Y
		31024 7.2	Demonstrate error control, flow control techniques and protocols and analyze them	1.98	2.72	Y
		31024 7.3	Demonstrate the subnet formation with IP allocation mechanism and apply various routing algorithms	1.98	2.72	Y
		31024 7.4	Develop Client-Server architectures and prototypes	1.98	2.72	Y
		31024 7.5	Implement web applications and services using application layer protocols	1.98	2.72	Y
		31024 7.6	Use network security services and mechanisms	1.98	2.72	Y
310248: Laboratory Practice I	31024 8	31024 8.1	Design language translators by applying principles of lexical analysis, syntax analysis, and code generation	2.08	2.01	Y
		31024 8.2	Apply compilation and programming toolchains (such as Java and C/C++ environments with native interfaces) in program development workflows	2.08	2.01	Y
		31024 8.3	Analyze the internal structures and functional components of	2.08	1.98	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			Operating Systems, including process, memory, and file management			
		31024 8.4	Develop applications based on IoT and Embedded Systems architectures to address real-world problem scenarios	2.08	1.98	Y
		31024 8.5	Assess smart applications by integrating sensing, communication, and data processing mechanisms in IoT systems	2.08	1.94	Y
		31024 8.6	Formulate an IoT applications operating in cloud-based environments for scalable data storage, processing, and service delivery	2.08	1.94	Y
310249: Seminar and Technical Communication	31024 9	31024 9.1	Analyze a latest topic of professional interest	1.98	2.94	Y
		31024 9.2	Enhance technical writing skills	1.98	2.94	Y
		31024 9.3	Identify an engineering problem, analyze it and propose a work plan to solve it	1.98	2.94	Y
		31024 9.4	Communicate with professional technical presentation skills	1.98	2.94	Y
310251: Data Science and Big Data	31025 1	31025 1.1	Analyse the fundamental principles and challenges of Data Science and Big Data Analytics to real-world datasets, following the Data Science lifecycle for problem	1.98	3	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
Analytics			understanding and data preparation.			
		31025 1.2	Apply statistical methods including measures of central tendency, dispersion, correlation, and hypothesis testing for data representation, exploratory analysis, and informed decision-making on real datasets.	1.98	2.52	Y
		31025 1.3	Illustrate the Big Data Analytics Lifecycle by implementing and evaluating analytics workflows that include data discovery, preparation, model planning, model building, validation, and result communication.	1.98	2.84	Y
		31025 1.4	Develop analytics models using Python and Scikit-learn, incorporating data preprocessing, regression, classification, clustering, association rule mining, and text preprocessing techniques.	1.98	3	Y
		31025 1.5	Design data visualization techniques using Python libraries to effectively communicate insights from structured and unstructured datasets.	1.98	2.68	Y
		31025 1.6	Create Big Data storage and processing solutions using modern Big Data tools and technologies within the Hadoop ecosystem to analyze large-scale datasets efficiently.	1.98	2.68	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
310252: Web Technology	310252	310252.1	Discuss the structure and presentation of web pages using HTML and CSS.	1.90	2.36	Y
		310252.2	Apply JavaScript and DOM concepts to develop interactive client-side applications.	1.90	1.88	Y
		310252.3	Describe the concepts of Servlet and JSP in web applications	1.80	3.00	Y
		310252.4	Interpret Web services and frameworks for web applications	1.80	3.00	Y
		310252.5	Analyze server side technologies for web development	1.80	2.84	Y
		310252.6	Apply the effective web applications for business functionalities using latest web development platforms	1.80	2.84	Y
310253: Artificial Intelligence	310253	310253.1	Identify suitable intelligent agent architectures and their components for Artificial Intelligence applications.	1.98	2.68	Y
		310253.2	Describe uninformed search, informed search, and heuristic search approaches used in Artificial Intelligence.	1.98	2.52	Y
		310253.3	Interpret the behaviour of search strategies in deterministic and nondeterministic problem environments.	1.98	3	Y
		310253.4	Differentiate adversarial search techniques used in game-playing problems.	1.98	3	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		31025 3.5	Apply knowledge representation techniques such as ontological engineering to solve a given Artificial Intelligence problem.	1.98	2.68	Y
		31025 3.6	Examine the application of logical inference systems using a given knowledge representation for problem solving.	1.98	2.68	Y
310255: Internship	31025 5	31025 5.1	Create awareness of social, economic and administrative considerations in the working environment of industry organizations."	1.98	3	Y
		31025 5.2	Apply knowledge gained through internships to complete academic activities in appropriate technology and tools to solve given problems."	1.98	3	Y
		31025 5.3	Choose appropriate technology and tools to solve given problem	1.98	3	Y
		31025 5.4	Demonstrate abilities of a responsible professional and use ethical practices in day to day life.	1.98	3	Y
		31025 5.5	Create a network and social circle, and develop relationships with industry people.	1.98	3	Y
		31025 5.6	Analyse various career opportunities and decide career goals.	1.98	3	Y
310256: Data Science	31025 6	31025 6.1	Apply principles of Data Science for the analysis of real time problems	1.98	2.36	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
and Big Data Analytics Laboratory		31025 6.2	Implement data representation using statistical methods	1.98	2.36	Y
		31025 6.3	Implement and evaluate data analytics algorithms and text preprocessing	1.98	2.36	Y
		31025 6.4	Implement data visualization techniques and analyze big data	1.98	2.36	Y
310257: Web Technology Laboratory	31025 7	31025 7.1	Evaluate websites to identify planning and design issues .	1.98	2.31	Y
		31025 7.2	Apply the client side and server side technologies for web application development	1.98	2.34	Y
		31025 7.3	Analyze the web technology languages, frameworks and services	1.98	2.31	Y
		31025 7.4	Develop three tier web based applications	1.98	2.35	Y
310254C :Cloud Computing[Elective]	31025 4C	31025 4C.1	Describe cloud computing architectures, including logical architecture, reference models, system architecture, and deployment models.	1.98	3	Y
		31025 4C.2	Analyze cloud storage architectures, including distributed data storage, grid-based storage, and data management from LANs to WANs.	1.98	3	Y
		31025 4C.3	Discuss virtualization concepts and cloud infrastructure components, including CPU, network, and storage	1.98	3	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			virtualization, virtual clustering, and security aspects.			
		31025 4C.4	Illustrate cloud computing platforms to develop solutions for real-world applications in healthcare, biology, geosciences, business, and social networking.	1.98	3	Y
		31025 4C.5	Classify cloud data security issues, including cloud digital personas, content-level security, and associated advantages and disadvantages.	1.98	3	Y
		31025 4C.6	Examine advanced techniques and trends in cloud computing, including mobile cloud, Comet Cloud, multimedia cloud, energy-aware cloud, jungle computing, edge computing, containerization (Docker, Kubernetes), DevOps, and IoT–cloud convergence.	1.98	3	Y
310258:: Laboratory Practice II	31025 8	31025 28.1	Design system using different informed search / uninformed search or heuristic approaches	1.89	2.41	Y
		31022 8.2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning	1.89	2.38	Y
		31022 8.3	Design and develop an expert system	1.89	2.44	Y
		31025 8.4	Use tools and techniques in the area of Cloud Computing	1.89	2.43	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		310258.5	Use the knowledge of Cloud Computing for problem solving	1.89	2.41	Y
		310258.6	Apply the concepts Cloud Computing to design and develop applications	1.89	2.46	Y
310245A :IOT	310245A	310245A.1	Analyze the role, architecture, and significance of Embedded Systems in enabling Internet of Things (IoT) solutions.	1.80	3.00	Y
		310245A.2	Apply an IoT enabling technologies to develop functional IoT system architectures	1.80	2.00	Y
		310245A.3	Assess systematic design methodologies for developing IoT applications.	1.80	2.00	Y
		310245A.4	Describe an IoT communication protocols with respect to reliability, scalability, and performance	1.80	2.00	Y
		310245A.5	Design cloud-based architectures for data storage, processing, and management in IoT systems.	1.80	2.00	Y
		310245A.6	Compose secure IoT applications by applying security mechanisms and best practices.	1.80	2.00	Y
30245D: SPM	310245D	310245D.1	Describe the fundamental concepts and principles of Software Project Management.	1.98	3	Y
		310245D.2	Apply tools of Software Project Management	1.98	3	Y
		310245D.3	Define activities in software projects	1.98	3	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		31024 5D.4	Evalute a project and manage changes	1.98	3	Y
		31024 5D.5	Analyse Agile Project Management	1.98	3	Y
		31024 5D.6	Examine staffing process for team building and decision making in Software Projects and Management	1.98	3	Y
210241: Discrete Mathematics	21024 1	21024 1.1	Apply set theory, propositional logic and mathematical induction to formulate and solve the problems precisely.	1.98	2.87	Y
		21024 1.2	Analyze the properties of relations and functions, including equivalence relations, partial orderings, lattices, and closures to solve computational problems.	1.98	0.95	N
		21024 1.3	Apply fundamental counting principles, permutations, and combinations to model algorithmic problems.	1.98	0.79	N
		21024 1.4	Solve problems using graph representations, shortest paths algorithm, Euler and Hamilton paths, and graph coloring.	1.98	0.80	N
		21024 1.5	Analyze tree structures and tree-based algorithms including spanning trees, Huffman coding, and network flow algorithms to solve computing problems.	1.98	0.82	N
		21024 1.6	Evaluate algebraic structures using groups, rings, and fields to solve	1.98	0.64	N

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			the problems in coding theory and cryptography.			
210242: Fundamentals of Data Structures	21024 2	21024 2.1	Analyze problems and design efficient algorithms and evaluate their performance using asymptotic complexity analysis	1.98	2.04	Y
		21024 2.2	Apply array-based data structures for structured data representation such as polynomials and sparse matrices, considering time-space trade-offs.	1.98	0.92	N
		21024 2.3	Discriminate searching and sorting algorithms to solve real-world problems based on efficiency and application requirements.	1.98	0.56	N
		21024 2.4	Design dynamic data structures using linked lists to model and solve practical applications involving variable-sized data.	1.98	0.92	N
		21024 2.5	Apply stack-based techniques and recursion for expression evaluation, conversion, and backtracking-based problem solving	1.98	0.76	N
		21024 2.6	Develop queue-based systems including circular queues, dequeues, and priority queues for scheduling, simulation, and resource management applications.	1.98	0.76	N
210243: Object Oriented	21024 3	21024 3.1	Describe programming constructs, classes, objects, inheritance, and the role of predefined library	1.98	0.6	N

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
Programming			classes in object-oriented software development.			
		21024 3.2	Apply object-oriented solution approaches for small systems involving multiple interacting objects.	1.98	0.6	N
		21024 3.3	Describe the concepts of virtual functions and pure virtual functions in object-oriented programming.	1.98	0.6	N
		21024 3.4	Interpret fundamental object-oriented software principles such as encapsulation, abstraction, inheritance, and polymorphism for problem solving.	1.98	0.6	N
		21024 3.5	Examine the strengths and benefits of object-oriented programming in comparison with other programming paradigms.	1.98	0.6	N
		21024 3.6	Apply the features and capabilities of object-oriented programming languages used for application development.	1.98	0.6	N
210244: Computer Graphics	21024 4	21024 4.1	Identify the basic terminologies of Computer Graphics and interpret the mathematical foundation of the concepts of computer graphics	1.89	2.68	Y
		21024 4.2	Apply mathematics to develop Computer programs for elementary graphic operations	1.89	2.68	Y
		21024 4.3	Illustrate the concepts of windowing and clipping and apply	1.98	1.08	N

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			various algorithms to fill and clip polygons			
		21024 4.4	Apply the core concepts of computer graphics, including transformations in two and three dimensions, as well as viewing and projection techniques	1.98	1.08	N
		21024 4.5	Apply the concepts of color models, lighting, shading models, and hidden surface elimination techniques	1.98	0.60	N
		21024 4.6	Create effective programs using concepts of curves, fractals, animation and gaming	1.98	0.60	N
210245: Digital Electronics and Logic Design	21024 5	21024 5.1	Apply boolean algebra principles and K-map techniques to simplify boolean expressions.	1.98	2.36	Y
		21024 5.2	Design combinational digital circuits using K-map minimization techniques as per given specifications.	1.98	2.04	Y
		21024 5.3	Design sequential digital circuits using K-map minimization techniques as per given specifications.	1.98	1.08	N
		21024 5.4	Illustrate conceptual real-world digital system designs using Algorithmic State Machines (ASM) and Programmable Logic Devices (PLDs).	1.98	1.08	N

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		210245.5	Analyze and select appropriate logic family IC packages as per given design specifications.	1.98	1.08	N
		210245.6	Explain the basic organization and architecture of a digital computer system.	1.98	1.08	N
210250: Humanity and Social Science	210250	210250.1	Aware of the various issues concerning humans and society.	1.90	2.13	Y
		210250.2	Aware about their responsibilities towards society.	1.90	2.13	Y
		210250.3	Sensitized about broader issues regarding the social, cultural, economic and human aspects, involved in social changes.	1.90	2.13	Y
210246: Data Structures Lab	210246	210246.1	Apply linear data structures using sequential organization to solve numerical, textual, and matrix-based problems by implementing user-defined algorithms and analyzing basic computational logic.	1.98	3	Y
		210246.2	Analyze searching and sorting algorithms to organize and retrieve data efficiently while comparing their performance characteristics.	1.98	3	Y
		210246.3	Design dynamic data structures such as linked lists and stacks, and apply recursion and backtracking techniques to solve complex computational problems.	1.98	2.8	Y
		210246.4	Implement queue-based data structures including simple	1.98	3	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			queues, priority queues, dequeues, and circular queues to model real-world scheduling and service systems.			
210247: OOP and Computer Graphics Lab	210247	210247.1	Implement reusable programs using inheritance, polymorphism, exception handling and generic structures.	1.98	2.61	Y
		210247.2	Analyze the concept of file and apply it while storing and retrieving the data from secondary storages.	1.98	2.61	Y
		210247.3	Analyse computer graphics algorithms for line/circle drawing, scan conversion and filling using OOP concepts.	1.98	2.61	Y
		210247.4	Apply the concept of windowing and clipping and implement various algorithms to fill and clip polygons.	1.98	2.6	Y
		210247.5	Design graphics-based applications using curves, fractals, animation and gaming logic.	1.98	2.58	Y
210248: Digital Electronics Lab	210248	210248.1	Design, implement, and verify combinational logic circuits using standard ICs	1.98	2.7	Y
		210248.2	Design, implement, and test sequential circuits using flip-flops, counters, and registers	1.98	2.24	Y
		210248.3	Analyse and demonstrate the operation of different types of shift registers	1.98	2.16	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
210249: Business Communication Skills Lab	210249	210249.1	Demonstrate effective verbal/oral communication and active listening skills in professional and academic contexts through structured speaking, reading, and listening activities.	1.98	3.00	Y
		210249.2	Develop clear, concise, and well-structured written communication, including formal letters, reports, resumes, applications, and technical documents, following standard professional formats.	1.98	3.00	Y
		210249.3	Demonstrate effectively in group discussions, meetings, interviews, and presentations by applying appropriate communication strategies, presentation skills, and professional etiquette.	1.98	3.00	Y
		210249.4	Analyse self-assessment, goal setting, self-motivation, time management, and creative thinking techniques to support personal, academic, and career development.	1.98	3.00	Y
		210249.5	Justify effectively and ethically in multi-disciplinary and heterogeneous teams by applying teamwork principles, interpersonal skills, conflict management strategies, and leadership qualities during collaborative activities.	1.98	3.00	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
207003: Mathematics III	207003	207003.1	Solve Linear Differential Equations, essential in modelling and design of computer based systems.	1.8	0.6	N
		207003.2	Apply the concept of Fourier transform and Z-transform and its applications to continuous and discrete systems and image processing.	1.8	0.6	N
		207003.3	Apply Statistical methods like correlation and regression analysis for data analysis and predictions in machine learning	1.8	0.6	N
		207003.4	Apply Probability theory for data analysis and predictions in machine learning	1.8	0.6	N
		207003.5	Solve Algebraic and Transcendental equations and System of linear equations using numerical techniques.	1.8	0.6	N
		207003.6	Obtain Interpolating polynomials, numerical differentiation and integration used in modern scientific computing numerical solutions of ordinary differential equations used in modern scientific computing.	1.8	0.6	N
210252: Data Structures and Algorithms	210252	210252.1	Analyze hashing techniques and skip lists to achieve efficient data storage and retrieval by minimizing collisions and optimizing time complexity.	1.89	2.76	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		21025 2.2	Apply tree-based data structures including binary trees, Binary Search Trees, threaded trees, and Huffman trees to solve hierarchical and encoding problems.	1.89	1.97	Y
		21025 2.3	Analyze graph representations and algorithms to solve real-world problems involving connectivity, shortest paths, and spanning trees	1.89	2.29	Y
		21025 2.4	Analyze balanced and self-adjusting search trees to optimize searching and indexing operations	1.89	2.27	Y
		21025 2.5	Use efficient indexing techniques and multiway search techniques to store and maintain data	1.89	2.28	Y
		21025 2.6	Select file organization techniques and external sorting algorithms to manage secondary storage efficiently.	1.89	1.97	Y
210253: Software Engineering	21025 3	21025 3.1	Describe the fundamental concepts and terminology of software engineering and the software design process.	1.98	2.84	Y
		21025 3.2	Illustrate a software design model based on the given requirements specification.	1.98	2.84	Y
		21025 3.3	Apply the COCOMO model to estimate effort, cost, and schedule of a software project.	1.89	2.2	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		21025 3.4	Analyze software requirements & formulate design solution for a software	1.89	2.2	Y
		21025 3.5	Identify risk management & software configuration management	1.89	2.36	Y
		21025 3.6	Apply a strategic approach to software testing, including verification and validation techniques.	1.89	2.36	Y
210254: Microprocessor	21025 4	21025 4.1	Exhibit skill of assembly language programming for the application.	1.98	2.2	Y
		21025 4.2	Classify Processor architectures.	1.98	2.2	Y
		21025 4.3	Illustrate advanced features of 80386 Microprocessor.	1.98	1.08	N
		21025 4.4	Compare and contrast different processor modes.	1.98	1.08	N
		21025 4.5	Use interrupts mechanism in applications	1.89	0.6	N
		21025 4.6	Differentiate between Microprocessors and Microcontrollers.	1.89	0.6	N
210255: Principles of Programming Languages	21025 5	21025 5.1	Define basic principles of programming languages for effective and efficient program development.	1.89	0.60	N
		21025 5.2	Describe Data representation and Computations by Using Data Types, Statements, Subprograms and Encapsulation	1.89	0.60	N

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		21025 5.3	Demonstrate a programs in Java as a Object Oriented Programming language using classes, objects, data and methods	1.89	1.08	N
		21025 5.4	Apply the concepts of inheritance, encapsulation and packages in Java programming language	1.89	1.08	N
		21025 5.5	Analyze the concept of Multithreading in java for robust application development.	1.89	0.60	N
		21025 5.6	Apply basic concepts of Functional and Logical programming paradigm for simple software	1.89	0.60	N
210256: Data Structures and Algorithms Lab	21025 6	21025 6.1	Analyze non-linear data structures such as hash tables, dictionaries, skip lists, and tree-based structures to solve structured and hierarchical problems while evaluating time and space complexity.	1.98	2.60	Y
		21025 6.2	Apply graph-based and search-tree-based algorithms to solve real-world optimization and connectivity problems	1.98	2.80	Y
		21025 6.3	Implement indexing, priority queues, heap-based sorting, and file organization techniques to manage large datasets and secondary storage efficiently.	1.98	2.60	Y
		21025 6.4	Design a mini-project using appropriate data structures to demonstrate performance	1.98	2.80	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			improvement, modular programming, and real-world applicability.			
210257: Microprocessor Lab	210257	210257.1	Apply various addressing modes and instruction set to implement assembly language programs	1.89	1.41	N
		210257.2	Apply assembly language concepts to develop programs	1.89	1.39	N
		210257.3	Analyze logic to demonstrate processor mode of operation	1.89	1.28	N
210259: Code of Conduct	210259	210259.1	Apply the concept of profession, professional ethics, moral and social issues, industrial standards, and codes of ethics in engineering practice.	1.98	2.3	Y
		210259.2	Demonstrate awareness of professional rights and responsibilities of engineers with respect to safety, risk, and risk–benefit analysis.	1.98	2.3	Y
		210259.3	Analyze the impact of engineering solutions on society and the environment, and evaluate the importance of sustainable development	1.98	2.3	Y
		210259.4	Apply ethical principles to resolve professional dilemmas arising in global, industrial, and societal contexts.	1.98	2.3	Y
210258: Project	210258	210258.1	Identify real-life societal problems relevant to computer engineering applications	1.98	2.38	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
Based Learning		21025 8.2	Compare and select the most feasible solution from multiple alternative approaches using defined constraints	1.98	2.38	Y
		21025 8.3	Analyze and synthesize the identified problem from a technological and system design perspective	1.98	2.38	Y
		21025 8.4	Design a reliable and scalable solution considering performance, cost, and real-world constraints	1.98	2.38	Y
		21025 8.5	Evaluate the developed solution using predefined technical, economic, and societal criteria	1.98	2.38	Y
		21025 8.6	Demonstrate self-directed and lifelong learning skills while addressing societal problems through project work	1.98	2.38	Y
Engineering Mathematics – I	10700 1	10700 1.1	Apply Mean Value Theorems and Taylor's and Maclaurin's series to approximate functions in basic engineering problems.	1.80	2.04	Y
		10700 1.2	solve Fourier series representation to perform harmonic analysis of periodic continuous and discrete systems.	1.80	1.84	Y
		10700 1.3	Use concepts of partial derivatives to analyze functions of several variables in engineering applications.	1.80	2.04	Y
		10700 1.4	Apply the concept of Jacobian and partial derivatives to determine	1.80	2.04	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
			functional dependence, error estimation, and extreme values of functions.			
		10700 1.5	solve matrix algebra techniques to solve and analyze systems of linear equations.	1.80	1.88	Y
		10700 1.6	Use concepts of matrices and linear algebra to determine linear and orthogonal transformations, eigenvalues, and eigenvectors for engineering problems..	1.80	1.88	Y
Engineering Physics	10700 2	10700 2.1	Explain interference, diffraction and polarization and apply them to basic engineering applications.	1.80	1.36	N
		10700 2.2	Describe principles of lasers and optical fibers and apply them to engineering applications.	1.80	1.40	N
		10700 2.3	Define basic quantum mechanics concepts and apply them to elementary engineering applications.	1.80	1.88	Y
		10700 2.4	Illustrate semiconductor theory and apply it to basic semiconductor devices.	1.80	1.88	Y
		10700 2.5	Recite magnetism and superconductivity and apply them to simple technological applications.	1.80	1.88	Y
		10700 2.6	Explain NDT principles and apply basic concepts of nanomaterials to engineering applications.	1.80	1.88	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
Systems in Mechanical Engineering	107003	107003.1	Describe and compare the conversion of energy from renewable and non-renewable energy sources	1.80	2.36	Y
		107003.2	Explain basic laws of thermodynamics, heat transfer and their applications	1.80	2.36	Y
		107003.3	List down the types of road vehicles and their specifications	1.80	2.20	Y
		107003.4	Illustrate various basic parts and transmission system of a road vehicle	1.80	2.20	Y
		107003.5	Discuss several manufacturing processes and identify the suitable process	1.80	2.20	Y
		107003.6	Explain various types of mechanism and its application	1.80	2.20	Y
Basic Electrical Engineering	103004	103004.1	Differentiate between electrical and magnetic circuits and explain self and mutual inductance with coupling effect using basic mathematical relations.	1.8	1.68	Y
		103004.2	Calculate equivalent capacitance for series, parallel, and composite circuits and determine parameters of alternating quantities using phasor arithmetic.	1.8	1.72	Y
		103004.3	Apply standard expressions to determine impedance, current, and power in series and parallel RLC circuits using phasor diagrams.	1.8	1.88	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		10300 4.4	Apply phase and line relationships in polyphase systems and calculate efficiency and regulation of a single-phase transformer under different load conditions.	1.8	1.88	Y
		10300 4.5	Apply KVL, KCL, star–delta conversion, and network theorems to solve resistive DC circuits.	1.8	1.88	Y
		10300 4.6	Explain work, power, and energy relations and identify suitable batteries based on charging, discharging, and depth of charge.	1.8	1.88	Y
Programming and Problem Solving	11000 5	110005 .1	Apply problem-solving skills to analyze and solve computational problems.	1.8	2.52	Y
		110005 .2	Select appropriate programming constructs and language features to solve problems in diverse application domains.	1.8	2.84	Y
		110005 .3	Develop well-documented Python programs using logical and control constructs of the language.	1.8	2.36	Y
		110005 .4	Use the Python program development environment effectively to implement and test programs.	1.8	2.2	Y
Workshop Practice	111006	111006 .1	Familiar with safety norms to prevent any mishap in the workshop.	1.8	3	Y
		111006 .2	Able to handle appropriate hand tools, cutting tools and machine tools to manufacture a job.	1.8	3	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		111006.3	Able to understand the construction, working and functions of machine tools and their parts.	1.8	3	Y
		111006.4	Able to know simple operations (Turning and Facing) on a centre lathe.	1.8	3	Y
Engineering Mathematics – II	107008	107008.1	Use mathematical tools to solve first-order differential equations arising in physical system	1.8	1.88	Y
		107008.2	Solve advanced integration techniques to evaluate integrals in engineering problems.	1.8	1.68	Y
		107008.3	Apply standard methods to trace curves and compute arc lengths.	1.8	2.04	Y
		107008.4	Explain concepts of solid geometry using equations of sphere, cone, and cylinder.	1.8	2.04	Y
		107008.5	Use multiple integrals to determine area, volume, centre of gravity, and moment of inertia.	1.8	2.04	Y
		107008.6				
Engineering Chemistry	107009	107009.1	Apply suitable methodologies for water analysis and techniques of water softening for treating water as an engineering commodity.	1.8	1.72	Y
		107009.2	Select and apply appropriate electro-analytical techniques and methods of material analysis for basic engineering applications.	1.8	1.72	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		10700 9.3	Explain the properties, classification, and applications of advanced engineering materials used in engineering fields.	1.8	1.88	Y
		10700 9.4	Apply fundamental concepts of fuel chemistry to evaluate fuels and suggest suitable alternative fuels.	1.8	1.88	Y
		10700 9.5	Identify chemical compounds based on their molecular structure and functional groups.	1.8	1.68	Y
		10700 9.6	Describe the causes of corrosion and methods for minimizing corrosion in engineering materials.	1.8	1.88	Y
Basic Electronics Engineering	10401 0	10401 0.1	Explain the working principle of the P–N junction diode and its basic electronic circuits.	1.8	2.04	Y
		10401 0.2	Identify different types of diodes, plot their V–I characteristics, and compare the basic features of BJT and MOSFET.	1.8	1.72	Y
		10401 0.3	Build and test basic analog circuits using OPAMPs and digital circuits using logic gates and flip-flops.	1.8	1.72	Y
		10401 0.4	Use electronic measuring instruments to measure various electrical parameters.	1.8	1.52	N
		10401 0.5	Select appropriate sensors for specific engineering applications.	1.8	1.56	Y
		10401 0.6	Describe the basic principles and block diagram of communication systems.	1.8	1.56	Y

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
Engineering Mechanics	101011	101011.1	Apply principles of engineering mechanics to determine the resultant of various force systems.	1.8	0.88	N
		101011.2	Analyze engineering problems to determine centroid, moment of inertia, and frictional forces in mechanical systems.	1.8	1.24	N
		101011.3	Apply conditions of equilibrium to determine support reactions of beams and forces in cable systems.	1.8	1.08	N
		101011.4	Analyze trusses and frames to evaluate internal member forces and apply equilibrium principles to forces in space.	1.8	1.08	N
		101011.5	Apply principles of kinematics to calculate position, velocity, and acceleration of particles.	1.8	0.92	N
		101011.6	Analyze particle motion using kinetics principles and concepts of work, power, and energy.	1.8	0.92	N
Engineering Graphics	102012	102012.1	Draw the fundamental engineering objects using basic rules and be able to construct the simple geometries.	1.8	1.36	N
		102012.2	Construct the various engineering curves using the drawing instruments.	1.8	1.56	Y
		102012.3	Apply the concept of orthographic projection of an object to draw several 2D views and its sectional views for visualizing the physical state of the object	1.8	1.08	N

Course	Course ID	CO No.	CO Statement	Target	Attainment	Attained /Not Attained (Y/N)
		10201 2.4	Apply the visualization skill to draw a simple isometric projection from given orthographic views precisely using drawing equipment.	1.8	0.76	N
		10201 2.5	Draw the development of lateral surfaces for cut sections of geometrical solids.	1.8	0.92	N
		10201 2.6	Draw fully-dimensioned 2D, 3D drawings using computer aided drafting tools.	1.8	0.92	N
Project Based Learning	11001 3	110013 .1	Project based learning will increase their capacity and learning through shared cognition.	1.8	3	Y
		110013 .2	Students are able to draw on lessons from several disciplines and apply them in a practical way.	1.8	3	Y
		110013 .3	Learning by doing approach in PBL will promote long-term retention of material and replicable skill, as well as improve teachers' and students' attitudes towards learning.	1.8	3	Y

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

3.8	Attainment of Program Outcomes and Program-Specific Outcomes	Claimed Marks (25)	Max Marks (25)
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CO 2	3.0	3.0	2.0	2.0	-	-	-	-	-	-	-	-	3.0	2.0
CO 3	3.0	3.0	2.0	2.0	-	-	-	-	-	-	-	-	2.0	3.0
CO 4	3.0	3.0	2.0	2.0	-	-	-	-	-	-	-	-	3.0	2.0
CO 5	3.0	3.0	2.0	2.0	-	-	-	-	-	-	-	-	3.0	2.0
CO 6	3.0	3.0	2.0	2.0	-	-	-	-	-	-	-	-	3.0	3.0
Attainment level	2.83	3.00	1.83	1.83	-	-	-	-	-	-	-	-	2.67	2.33
410252A Elective V- Natural Language Processing														
CO 1	3.00	2.00	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	1.90	2.80	1.90	1.90	-	-	-	-	-	-	-	-	-	-
CO 3	2.00	2.00	3.00	2.00	2.00	-	-	-	-	-	-	-	2.00	-
CO 4	2.00	3.00	2.00	2.00	2.00	-	-	-	-	-	-	-	-	2.00
CO 5	1.70	1.70	2.50	-	2.50	-	-	-	-	-	-	-	1.70	-
CO 6	1.70	2.50	1.70	1.70	1.70	-	-	-	-	-	-	-	1.70	1.70
Attainment level	2.04	2.34	2.22	1.89	2.05	-	-	-	-	-	-	-	1.79	1.84
410253C Elective VI-Business Intelligence														
CO 1	2.5	1.7	-	-	-	-	-	-	-	-	-	0.8	1.7	0.8
CO 2	2.5	1.7	2.5	-	1.7	-	-	-	-	-	1.7	-	2.5	2.5
CO 3	1.7	-	1.7	-	2.5	-	-	-	1.7	2.5	-	-	1.7	1.7
CO 4	1.7	2.5	-	1.7	2.5	-	-	-	-	-	-	-	2.5	1.7
CO 5	2.5	2.5	1.7	1.7	2.5	-	-	-	-	-	-	0.8	2.5	1.7
CO 6	1.7	2.5	-	-	-	1.7	-	-	-	1.7	2.5	1.7	1.7	1.7
Attainment level	2.10	2.18	1.96	1.68	2.31	1.68	-	-	1.68	2.10	2.10	1.12	2.10	1.68
410253A Elective VI-Pattern Recognitions														
CO 1	2.80	1.90	-	-	1.90	-	-	-	-	-	-	-	2.80	-
CO 2	2.50	1.70	2.50	-	-	-	-	-	-	-	-	-	2.50	1.70
CO 3	3.00	2.00	-	3.00	-	-	-	-	-	-	-	-	3.00	-
CO 4	-	-	-	2.00	2.00	-	-	-	-	-	-	3.00	-	2.00
CO 5	3.00	2.00	3.00	-	-	-	-	-	-	-	-	-	3.00	-
CO 6	3.00	2.00	-	-	2.00	-	-	-	-	-	-	-	3.00	2.00
Attainment level	2.87	1.91	2.76	2.50	1.96	-	-	-	-	-	-	3.00	2.87	1.89
410256:Project Stage-II														
CO 1	3.0	2.0	3.0	2.0	3.0	-	-	1.0	2.0	2.0	2.0	2.0	3.0	3.0

CO 2	3.0	3.0	2.0	3.0	2.0	2.0	1.0	2.0	2.0	2.0	-	2.0	3.0	3.0
CO 3	3.0	2.0	3.0	2.0	3.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	3.0	3.0
CO 4	2.0	2.0	2.0	2.0	2.0	-	-	1.0	3.0	3.0	2.0	2.0	3.0	2.0
Attainment level	2.75	2.25	2.50	2.25	2.50	2.00	1.00	1.25	2.25	2.25	2.00	2.00	3.00	2.75
310241:Database Management Systems														
CO 1	2.80	1.90	-	-	0.90	-	-	-	-	-	-	-	0.90	0.90
CO 2	1.80	2.70	1.80	-	2.70	-	-	-	-	-	-	-	0.90	0.90
CO 3	1.40	1.40	2.00	-	1.40	-	-	-	-	-	-	-	0.70	0.70
CO 4	1.90	1.90	-	0.60	0.60	-	-	-	-	-	-	-	0.60	0.60
CO 5	1.50	1.50	-	0.70	1.50	-	-	-	-	-	-	0.70	0.70	0.70
CO 6	1.50	1.50	-	0.70	1.50	-	-	-	-	-	-	0.70	1.50	1.50
Attainment level	1.80	1.79	1.91	0.70	1.42	-	-	-	-	-	-	0.73	0.89	0.89
310242:Theory of Computation														
310242.1	2.6	1.7	1.7	-	-	-	-	-	-	-	-	-	1.7	-
310242.2	2.6	2.6	-	1.7	-	-	-	-	-	-	-	-	1.7	-
310242.3	2.3	1.5	2.3	1.5	-	-	-	-	-	-	-	-	1.5	0.8
310242.4	2.3	2.3	1.5	1.5	-	-	-	-	-	-	-	-	1.5	-
310242.5	1.8	1.8	1.2	1.8	-	-	-	-	-	-	-	1.2	1.2	-
310242.6	1.8	1.8	-	1.8	-	-	-	-	-	-	-	1.2	1.2	-
Attainment level	2.21	1.94	1.67	1.66	-	-	-	-	-	-	-	1.20	1.47	0.76
310243:Systems Programming and Operating System														
<u>310.243.CO 1</u>	1.70	1.70	1.70	0.80	-	-	-	-	-	-	-	0.80	-	-
310.243.CO 2	1.70	1.70	0.80	1.70	-	-	-	-	-	-	-	-	0.80	-
310.243.CO 3	0.90	0.90	0.50	0.50	-	-	-	-	-	-	-	-	0.50	-
310.243.CO 4	0.90	0.50	0.90	0.50	0.50	-	-	-	-	-	-	0.50	0.90	0.90
310.243.CO 5	0.80	0.80	0.40	0.80	-	-	-	-	-	-	-	0.40	0.80	0.80
310.243.CO 6	0.80	0.40	0.80	0.40	-	-	-	-	-	-	-	0.40	0.80	0.80

CO 2		1.30	0.60	1.90	0.60				0.60				1.90	1.90
CO 3	2.00		2.00	1.00		1.0 0					1.0 0		3.00	3.00
CO 4	1.00	3.00	1.00	2.00	2.00	1.0 0		1.0 0				1.0 0	3.00	2.00
CO 5	0.90	0.90	1.90		2.80		0.90	0.9 0		0.9 0			2.80	2.80
CO 6	1.90	0.90		1.90	0.90	0.9 0		0.9 0					2.80	2.80
Attainment level	1.32	1.38	1.42	1.52	1.42	0.9 7	0.90	0.9 3	0.60	0.9 0	1.0 0	1.0 0	2.65	2.50
310253:Artificial Intelligence														
CO 1	1.80	1.80	0.90		1.80	0.9 0						1.8 0		0.90
CO 2	2.50	2.50	1.70	1.70	2.50									1.70
CO 3	3.00	3.00	3.00	2.00	3.00	1.0 0			2.00	1.0 0		2.0 0	1.00	3.00
CO 4	3.00	3.00	3.00	2.00	3.00	1.0 0		1.0 0				2.0 0		
CO 5	2.70	2.70	1.80	1.80	1.80			0.9 0					0.90	1.80
CO 6	2.70	2.70	1.80	1.80	1.80							2.7 0		1.80
Attainment level	2.6	2.6	2.0	1.9	2.3	1.0	-	1.0	2.0	1.0	-	2.1	1.0	1.8
310255:Internship														
CO 1	-	-	-	-	2.00	2.0 0	2.00	2.0 0	1.00	2.0 0	2.0 0	-	-	-
CO 2	-	2.00	-	-	3.00		2.00	3.0 0	2.00	2.0 0	3.0 0	-	-	-
CO 3	-	-	-	-	-	2.0 0	-	-	3.00	2.0 0	-	-	1.00	-
CO 4	1.00	-	-	-	-	1.0 0	2.00	2.0 0	-	-	-	-	1.00	-
CO 5	-	-	-	-	-	2.0 0	-	2.0 0	-	2.0 0	-	2.0 0	-	-
CO 6	-	-	-	-	-	3.0 0	-	-	2.00	2.0 0	-	-	-	1.00
Attainment level	1.00	2.00	-	-	2.50	2.0	2.00	2.2	2.00	2.0	2.5	2.0	1.00	1.00

						0		5		0	0	0		
310256:Data Science and Big Data Analytics Laboratory														
CO 1	2.40	2.40	1.60	1.60	1.60	-	-	-	-	-	0.80	2.40	1.60	1.60
CO 2	2.40	2.40	-	2.40	0.80	-	-	-	-	-	-	1.60	-	0.80
CO 3	1.60	2.40	2.40	1.60	1.60	-	-	-	-	0.80	-	2.40	2.40	2.40
CO 4	1.60	1.60	-	1.60	2.40	-	-	-	-	-	-	2.40	-	1.60
Attainment level	1.97	2.16	1.97	1.77	1.57	-	-	-	-	0.79	0.79	2.16	1.97	1.57
310257:Web Technology Laboratory														
CO 1	1.5	1.5	0.8	1.5	0.8				0.8	0.8	0.8		0.8	
CO 2	1.6	1.6	1.6	1.6	1.6				0.8	0.8	0.8		0.8	
CO 3	1.5	1.5	1.5	1.5	1.5				0.8	1.5	0.8		1.5	1.5
CO 4	1.6	1.6	2.3	1.6	1.6			0.8	0.8	1.6	1.6		1.6	1.6
Attainment level	1.55	1.55	1.55	1.55	1.36			0.78	0.78	1.16	0.97		1.16	1.55
310254C :Cloud Computing[Elective]														
CO 1	3.0	3.0	2.0	-	1.0	-	-	-	-	-	-	-	-	-
CO 2	3.0	3.0	2.0	-	1.0	-	-	-	-	-	-	-	-	-
CO 3	3.0	3.0	2.0	-	1.0	-	-	-	-	-	-	-	-	-
CO 4	3.0	3.0	2.0	-	1.0	-	-	-	-	-	-	-	-	-
CO 5	3.0	3.0	2.0	-	2.0	-	-	-	-	-	-	-	1.0	1.0
CO 6	3.0	3.0	2.0	-	1.0	-	-	-	-	-	-	-	2.0	1.0
Attainment level	3.00	3.00	2.00	-	1.17	-	-	-	-	-	-	-	1.50	1.00
310258:: Laboratory Practice II														
CO 1	2.4	2.4	2.4	1.6	1.6				1.6	0.8		1.6	2.4	1.6
CO 2	2.4	2.4	1.6	1.6	1.6				0.8	0.8		1.6	2.4	1.6
CO 3	2.4	1.6	2.4	1.6	1.6				1.6	0.8	0.8	1.6	2.4	1.6
CO 4	1.6				2.4				0.8	0.8		1.6	1.6	2.4
CO 5	1.6	1.6	1.6	0.8	1.6				0.8	0.8		1.6		1.6

CO 6	1.6	1.6	2.5	1.6	2.5				1.6	0.8	0.8	1.6	1.6	1.6
Attainment level	2.02	1.93	2.10	1.45	1.89				1.21	0.8 1	0.8 2	1.6 2	2.10	1.75
310245A Internet Of Things and Embedded Systems														
CO 1	2.0	2.0	-	1.0	-	-	-	-	-	-	-	-	2.0	-
CO 2	2.0	2.0	2.0	2.0	1.0	-	-	-	-	-	-	-	2.0	1.0
CO 3	2.0	2.0	2.0	2.0	-	-	-	-	-	-	-	-	2.0	1.0
CO 4	2.0	2.0	-	2.0	1.0	-	-	-	-	-	-	-	2.0	-
CO 5	2.0	2.0	2.0	2.0	2.0	-	-	-	-	-	-	-	2.0	2.0
CO 6	2.0	2.0	2.0	2.0	2.0	2.0	-	-	-	-	-	-	2.0	2.0
Attainment level	2.00	2.00	2.00	1.83	1.50	2.0 0	-	-	-	-	-	-	2.00	1.50
310245D Software Project Management														
CO 1	3.00	2.00	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	2.00	3.00	2.00	-	3.00	-	-	-	-	-	-	-	2.00	-
CO 3	2.00	2.00	3.00	-	-	-	-	-	-	-	-	-	2.00	-
CO 4	2.00	3.00	3.00	2.00	2.00	-	-	-	-	-	-	-	2.00	2.00
CO 5	2.00	3.00	3.00	-	2.00	-	-	-	2.00	-	-	-	2.00	-
CO 6	-	2.00	-	-	-	-	-	-	3.00	-	-	-	-	2.00
Attainment level	2.20	2.50	2.75	2.00	2.33	-	-	-	2.50	-	-	-	2.00	2.00
210241:Discrete Mathematics														
CO 1	2.9	1.9	1.0	1.0	-	-	-	-	-	-	-	-	1.9	-
CO 2	1.0	1.0	-	0.6	-	-	-	-	-	-	-	-	1.0	-
CO 3	0.5	0.5	-	0.3	-	-	-	-	-	-	-	-	0.5	-
CO 4	0.5	0.5	0.5	0.5	-	-	-	-	-	-	-	-	0.8	-
CO 5	0.5	0.8	0.5	0.5	-	-	-	-	-	-	-	-	0.8	-
CO 6	0.4	0.6	0.4	0.6	-	-	-	-	-	-	-	-	0.4	-
Attainment level	0.98	0.90	0.62	0.60	-	-	-	-	-	-	-	-	0.91	-
210242:Fundamentals of Data Structures			0.60	0.60										
CO 1	1.70	1.70	1.10	1.10	-	-	-	-	-	-	-	1.1 0	1.70	-
CO 2	0.60	0.40	0.40	-	-	-	-	-	-	-	-	0.2 0	0.60	-
CO 3	0.60	0.60	0.40	0.40	-	-	-	-	-	-	-	0.4	0.60	0.40

												0		
CO 4	0.90	0.90	0.90	-	-	-	-	-	-	-	-	0.30	0.90	-
CO 5	0.80	0.80	0.50	0.50	-	-	-	-	-	-	-	0.50	0.80	-
CO 6	0.80	0.50	0.80	-	-	-	-	-	-	-	-	0.30	0.80	-
Attainment level	0.89	0.81	0.68	0.68	-	-	-	-	-	-	-	0.46	0.89	0.37
210243:Object Oriented Programming														
CO 1	0.60	0.40	-	-	-	-	-	-	-	-	-	-	0.40	-
CO 2	0.40	0.60	0.60	-	-	-	-	-	-	-	-	-	0.40	0.40
CO 3	0.60	0.40	-	-	-	-	-	-	-	-	-	-	0.20	0.20
CO 4	0.60	0.60	0.40	-	-	-	-	-	-	-	-	-	-	-
CO 5	0.40	0.40	-	0.40	-	-	-	-	-	-	-	-	-	-
CO 6	0.40	-	0.60	-	0.60	-	-	-	-	-	-	-	0.40	0.40
Attainment level	0.50	0.48	0.53	0.40	0.60	-	-	-	-	-	-	-	0.35	0.33
210244:Computer Graphics														
CO 1	2.7	2.7	0.9	1.8	-	-	-	-	-	-	-	-	1.8	0.9
CO 2	2.7	2.7	2.7	1.8	-	-	-	-	-	-	-	-	2.7	1.8
CO 3	1.1	1.1	1.1	0.7	-	-	-	-	-	-	-	-	1.1	0.7
CO 4	1.1	1.1	1.1	0.7	-	-	-	-	-	-	-	-	1.1	0.7
CO 5	0.6	0.6	0.6	0.4	-	-	-	-	-	-	-	-	0.6	0.4
CO 6	0.6	0.6	0.6	0.4	-	-	-	-	-	-	-	-	0.6	0.6
Attainment level	1.45	1.45	1.16	0.97	-	-	-	-	-	-	-	-	1.30	0.85
210245:Digital Electronics and Logic Design														
CO 1	2.4	1.6												
CO 2	1.4	1.4	2.0										1.4	
CO 3	0.7	0.7	1.1										0.7	
CO 4	0.7	0.7	1.1	0.7										
CO 5	1.1	1.1		0.7										
CO 6	1.10	0.70												
Attainment level	1.22	1.03	1.40	0.72									1.04	
210250:Humanity and Social Science														
CO 1							2.90	2.0	2.00					

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CO 1						1.0			1.0	3.0		1.0		1.0
CO 2										3.0		1.0		
CO 3						1.0			2.0	3.0	1.0		1.0	
CO 4										1.0	1.0	3.0		
CO 5										2.0	2.0	1.0		
Attainment level	-	-	-	-	-	1.0 0	-	-	1.50	2.4 0	1.3 3	1.5 0	1.00	1.00
207003:Mathematics III														
CO 1	0.60	0.40										0.4 0	0.20	
CO 2	0.60	0.40										0.4 0	0.20	
CO 3	0.60	0.60			0.40							0.4 0	0.20	
CO 4	0.40	0.60			0.40							0.4 0	0.20	
CO 5	0.60	0.40										0.4 0	0.20	
CO 6	0.60	0.40			0.20							0.4 0	0.20	
Attainment level	0.57	0.47	-	-	0.33	-	-	-	-	-	-	0.4 0	0.20	-
210252:Data Structures and Algorithms														
CO 1	2.8	2.8	1.8	0.9	-	-	-	-	-	-	-	-	2.8	1.8
CO 2	1.3	1.3	0.7	-	-	-	-	-	-	-	-	-	2.0	1.3
CO 3	1.5	2.3	2.3	1.5	-	-	-	-	-	-	-	-	2.3	1.5
CO 4	1.5	2.3	1.5	1.5	-	-	-	-	-	-	-	-	1.5	1.5
CO 5	1.5	0.8	0.8	-	-	-	-	-	-	-	-	-	1.5	1.5
CO 6	1.3	1.3	0.7	-	-	-	-	-	-	-	-	-	1.3	2.0
Attainment level	1.66	1.79	1.29	1.32									1.89	1.62
210253:Software Engineering														
CO 1	2.80	1.90	-	-	-	-	-	-	-	-	-	1.9 0	-	2.80
CO 2	2.80	-	2.80	-	-	-	-	-	-	1.9 0	-	-	-	2.80
CO 3	2.20	1.50	-	-	-	-	-	-	-	-	2.2 0	-	1.50	-

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CO 1	1.10	1.10												
CO 2	1.10	1.10												
CO 3	1.10	1.10												
CO 4	0.90	0.90												
CO 5	1.10	1.10												
CO 6	1.10	1.10												
Attainment level	1.07	1.07												
102012:Engineering Graphics														
CO 1	1.60	1.00												
CO 2	1.60	1.00												
CO 3	1.10	1.10												
CO 4	0.80	0.50												
CO 5	0.90	0.90												
CO 6	0.60	0.60			0.90									
Attainment level	1.10	0.85			0.90									
110013:Project Based Learning														
CO 1														
CO 2	0.70	0.40												
CO 3	0.40	0.60	0.60											
CO 4	0.20	0.40	0.40											
CO 5														
CO 6														
Attainment level	0.43	0.47	0.50											
Direct Attainment	1.70	1.66	1.64	1.48	1.53	1.34	1.38	1.14	1.58	1.53	1.58	1.42	1.63	1.56
Indirect Attainment														
Employer Feedback	2.40	3.00	3.00	2.25	2.50	2.75	2.00	2.00	3.00	2.80	2.00	2.20		
Alumni Feedback	2.09	1.96	1.91	1.91	2.04	1.87	1.91	2.00	2.30	2.17	2.22	2.17	1.87	2.17
Parent Feedback	3.00	2.79	2.86	3.00	3.00	2.86	3.00	2.93	3.00	2.93	2.86	3.00		
Program Exit Survey 2024-25	2.60	2.64	2.60	2.66	2.57	2.55	2.61	2.67	2.61	2.66	2.57	2.64	2.80	2.81
Indirect Attainment	2.52	2.60	2.59	2.46	2.53	2.51	2.38	2.40	2.73	2.64	2.41	2.50	2.34	2.49

Total Attainment (80% Direct + 20% Indirect)	1.86	1.85	1.83	1.68	1.73	1.58	1.58	1.40	1.81	1.75	1.75	1.64	1.77	1.74

INCLUSION OF ETHICS AT VARIOUS LEVELS

1 . Code of conduct for student:



"Techno – Social Excellence"
Marathwada Mitra Mandal's
INSTITUTE OF TECHNOLOGY (MMIT)
Lohgaon, Pune-411047

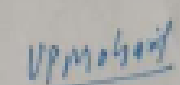
Code of Conduct for Student

1. Student must abide by the rules and regulation frame by the Institute from time to time.
2. It is imperative that the students should strictly adhere to report on the day of commencement and end of each term during the academic year.
3. The student must wear college uniform twice a week and whenever instructed by the college authorities.
4. Student should carry his/her identity card while he/she is in the campus of the institute.
5. The student is expected to read the notices put on the notice board of college, department and office regularly. The college is not responsible for any loss or damage caused to the students due to his failure to read the notices from time to time.
6. Student must check his/her college e-mail daily once as all the important notices from office/exam section are sent on college e-mail.
7. Without prior, written permission of the HOD/ Class Teacher, if a student remains absent for lectures or practical for more than a week, he/she will have to abide by the punishment of academic nature as decided by the authorities.
8. It is a responsibility of student to help in maintaining building and the campus of the Institute clean and tidy.
9. The student should note that he/she is responsible for his/her conduct in the premises of the institute and outside the premises as well.
10. The student should not participate in any political or antisocial activities.
11. If any objectionable conduct within or outside the premises of the Institute and hostel by the student, is observed or reported, then he/she is liable for strict disciplinary action.
12. According to clause 9.1 of the regulations, as per the High Court decision for University Act. 1956-Regulation 26(1)G-2009, if students found guilty of **Ragging**, he/she will liable for punishment
13. Student shall be liable for disciplinary action for misconduct and for violation of code of conduct.

The following acts shall constitute misconduct.

- Physical assault or threat, against any member of the campus.
- Carrying of, use of or threat to use any weapons.
- Violation of the status, dignity and honor of a student belonging to the scheduled castes, scheduled tribes and/or any religion.
- Any practice, whether verbal or otherwise, derogatory to women.
- Creating ill-will or intolerance on religious or communal ground.
- Willfully disrupting any teaching, study, assessment or research activities or the administration of the College.
- Willfully obstructing officer or employee of the College in the performance of his or her duties.
- Willfully damaging or wrongfully dealing with any property under the control of the College; any property on College premises; or property on a location where a student is present under the auspices of the College.
- Disobeying or failing, without reasonable cause, to observe any provision of the Bye-Laws, or any rule made by AICTE/DTE/University/ Institute of which students have been duly notified.
- Disobeying, without reasonable cause, any instruction of an officer or employee of the College.
- Withholding relevant information or furnishing false or misleading information for purposes connected with academic progression.
- Misuse of social media for spreading/forwarding contents that are objectionable by Laws.
- Indulging in Cyber Crime.


Mr. E. D. Kurhe
Dean, Student Affairs


Principal

Principal
Marathwada Mitra Mandali
INSTITUTE OF TECHNOLOGY
Lohgaon, Pune- 47



2 . Ethics in teaching and learning :

	"Techno – Social Excellence" Marathwada Mitra Mandal's INSTITUTE OF TECHNOLOGY (MMIT) Lohgaon, Pune-411047
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HANDBOOK ON HUMAN VALUES AND PROFESSIONAL ETHICS

A code of conduct is a set of rules outlining the norms, responsibilities and practices for an individual and committees for the smooth conduct in the organizations. It is expected that staff members strictly adhere to the rules and regulations spelled out in this document failing which the action shall be taken as per the procedure laid down by Savitibai Phule Pune University, Pune, Government of Maharashtra and Competent Authorities. The Local management committee reserves the right to change/modify the rules and regulations as and when necessary and apply their discretion in specific cases. The rules and regulations included in this handbook are applicable for students, Principal, Teaching staff, Official staff, supporting staff and Governing Committees.

ABOUT INSTITUTION:

The Marathwada Mitra Mandal's Institute of Technology, Lohgaon was established in the year 2008. The institute is affiliated to Savitribai Phule Pune University, Pune and approved by AICTE, New Delhi, recognized by DTE, Government of Maharashtra. The objective of the institution is to impart quality education for professional excellence and sustainable development through continual improvement and teamwork.

The Institution aims to provide quality technical education to students by grooming them for development of professional skills and value based engineering education. The institution ensures the trust's vision for overall development of students through continual improvement and teamwork. Quality education is the fundamental right of every Indian citizen. It lays the good foundation for individual growth.

Vision:

"Techno-Social Excellence"



3 . Ethics in Research and publication :

Ethics in research and publication refers to the moral principles and professional standards that guide researchers in conducting studies and communicating their findings. Ethical practices are essential to protect research participants, maintain scientific integrity, and ensure that published information is accurate, trustworthy, and beneficial to society.

Ethics in Research

Research involving human participants must respect their rights, dignity, privacy, and safety. Before beginning a study, researchers should obtain informed consent, ensuring that participants understand the purpose, procedures, potential risks, and benefits of the research. Participation should be voluntary, and individuals should have the freedom to withdraw at any time without penalty.

Researchers must maintain confidentiality and privacy. Personal information and sensitive data should be securely stored and used only for legitimate research purposes. Researchers should also take appropriate measures to minimize physical, psychological, social, or financial harm to participants.

Honesty and integrity are fundamental to research. Researchers must accurately collect, analyze, and report data. Fabrication (making up data), falsification (changing or manipulating data), and plagiarism (using another person's work without proper acknowledgment) are serious forms of research misconduct. Researchers should properly acknowledge the contributions and ideas of others through appropriate citations.

Research should also be conducted fairly and without discrimination. Researchers should avoid conflicts of interest that could influence the design, conduct, or interpretation of a study. Where conflicts exist, they should be disclosed transparently. Studies involving humans or animals should receive approval from the appropriate ethics committee or institutional review board before the research begins.

Ethics in Publication

Publication ethics ensures that research findings are communicated responsibly and transparently. Authors should report their results honestly, including findings that do not support their original hypothesis. They should not manipulate results or selectively report data to create misleading conclusions.

Authorship should be based on substantial contributions to the research. Individuals who have not made meaningful contributions should not be listed as authors, while those who have made significant contributions should receive appropriate credit. Duplicate publication, submitting the same manuscript to multiple journals simultaneously, and plagiarism are unethical practices.

Editors and reviewers also have important ethical responsibilities. Peer reviewers should evaluate manuscripts objectively, maintain confidentiality, and declare any conflicts of interest. Editors should make publication decisions based on the quality and relevance of the research rather than personal or commercial interests.

4 .Code of conduct for faculty :

The Code of Conduct for Faculty establishes the professional, ethical, and academic standards expected from teachers in an engineering institute. It promotes discipline, integrity, fairness, and a positive learning environment.

1. **Professional Integrity:** Faculty members shall perform their duties honestly, responsibly, and impartially. They should maintain high standards of professional competence and continuously update their technical and academic knowledge.
2. **Commitment to Teaching:** Faculty shall attend classes regularly and punctually, prepare lectures effectively, use appropriate teaching methods, and encourage students to develop technical knowledge, creativity, problem-solving abilities, and ethical values.
3. **Fairness and Respect:** Faculty shall treat all students equally and respectfully, without discrimination based on gender, religion, caste, race, disability, socioeconomic background, or any other personal characteristic. Harassment, bullying, intimidation, and inappropriate behavior are strictly prohibited.
4. **Assessment and Evaluation:** Faculty shall conduct examinations, assignments, projects, and assessments fairly and transparently. Marks and grades must be awarded objectively and without favoritism. Confidential examination materials and student records must be properly protected.
5. **Research Ethics:** Faculty involved in research shall maintain academic honesty and integrity. Fabrication, falsification, plagiarism, duplicate publication, and manipulation of research findings are unacceptable. Proper acknowledgment must be given to the contributions and ideas of others.
6. **Professional Conduct:** Faculty shall maintain appropriate behavior with students, colleagues, administrators, parents, and visitors. They should avoid

conflicts of interest and should not misuse their position for personal, financial, or political advantage.

7. **Confidentiality:** Faculty shall protect confidential information relating to students, examinations, research, institutional activities, and colleagues. Such information should not be disclosed without proper authorization.
8. **Use of Institutional Resources:** Institute facilities, equipment, laboratories, software, funds, and other resources shall be used responsibly and primarily for authorized academic, research, and institutional purposes.
9. **Attendance and Responsibilities:** Faculty members shall follow institutional rules regarding attendance, working hours, leave, meetings, academic duties, and administrative responsibilities. They should complete assigned tasks within the specified time.
10. **Professional Development:** Faculty are encouraged to participate in workshops, conferences, training programs, research activities, and other professional-development opportunities to improve their knowledge and teaching effectiveness.

APPENDIX A: FORMATS

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

Parent Feedback



"Techno – Social Excellence"
Marathwada Mitra Mandal's
INSTITUTE OF TECHNOLOGY (MMIT)
Lohgaon, Pune-411047

(A.Y:)
PARENT FEEDBACK FOR CURRICULUM AND INSTITUTION

Parents Name:		
Address:		
Mobile No.:		
Email:		
Occupation:		
Ward Name:		Mob. No:
Department :		Class: SE/TE/BE

Excellent: 4 Good: 3 Satisfactory: 2 Poor: 1

Sr. No.	Questions	Rating
Rate the Institute on Scale 1 to 4 on the basis of following aspects:		
1.	How do you rate the infrastructure? (Library/Laboratory/Internet/Wi-Fi Facility/ Hostel) facility provided by the institute)	
2.	Are you satisfied with the Administration of MMIT?	
3.	How do you rate the treatment given to your ward by the faculty?	
4.	The institution takes account of concern and suggestions of students/parents	
Rate the Course on Scale 1 to 4 on the basis of following aspects:		
5.	Are you happy with the curricular activities (Industrial Visit/Add-on Courses/Seminar/Guest Lecture etc) & extra-curricular activities (Sports/Cultural/NSS) organized by the institute?	
6.	How do you rate the quality and relevance of the courses included into the semester?	
7.	Do you feel that course contents are adequate to make your ward capable of Analyzing/solving the real life problem?	
8.	Do you feel the course has inculcated social and ethical values in your ward?	
9.	Rate the quality of education your ward has gained from course?	
10.	How do you rate the overall development of your ward?	

Any other Suggestions: _____

Date:

Signature Parent

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

Employer's Feedback

(A.Y.-20 - 20)

EMPLOYER FEEDBACK FORM

Employer Name	
Designation	
Industry Name	
Mobile No.	
Email-id	

Rate the Institute on Scale 1 to 4 on the basis of following aspects:

Excellent: 4 Good: 3 Satisfactory: 2 Poor: 1

Sr. No.	Question	Rating
1	Education environment at the Institute	
2	Curriculum caters industry demands	
3	Students' awareness of advancements in industry equipment & processes	
4	Implementation of Modern Tool usage	
5	Curriculum taught to the students balances Theory & Practical	
6	Leadership quality / Teamwork are imbibed in Students	
7	Students are aware of Professional Ethics	
8	Students are well equipped with Technical Competency	
9	Fulfillment of Communication Skills required by industry	
10	Aptitude and Problem Analysis Skills among Students	

Any other Suggestion:

Date:

Signature

Alumni Feedback

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

ALUMNI FEEDBACK FOR CURRICULUM AND INSTITUTION

(A.Y. : 20 - 20)

Alumni Details	
Name of the Alumni	
Current status	
Branch	
Year of Passing	
Mobile No.	
Email	
Rating:	Excellent: 4 Good: 3 Satisfactory: 2 Poor: 1
Sr.No.	Questions
1	How do you find overall infrastructure at MMIT?
2	How do you find the Academic ambience of the institute for producing high-quality graduates?
3	Do you think the Interaction with Industry during your study was adequate?
4	Do you think Sufficient efforts are taken for soft skill development by institute?
5	Has Institute provided enough facility & expertise in all subjects?
6	Do you think the Faculty encouraged your hands-on competence to justify your Competence?
7	How do you rate Institute contribution towards creating awareness about contemporary issues for betterment of society (social responsibility, humanities, soft skill)?
8	Do you have Willingness of following? Please tick. 1. To have recruitment done at the department for your company/organization 2. To allow training for department students at your company/organization 3. To sponsor projects for department students at your company/organization
9	Do you feel the existing curriculum fulfill the industrial requirement? If No, please suggest inclusion in curriculum for enrichment, skill development and aptitude building
10	What did you learn during graduation that is most applicable (useful, most vital) to your current position?
11	Please express your views on strengths, weaknesses, areas that need improvement, Opinions on Facilities /Utilities etc. briefly
12	What are your suggestions for further improvement at MMIT?

Date:

Signature of Alumni

Student Exit Feedback/Program Exit Feedback/Graduate Exit Feedback

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

Q. 1 Do you able to apply the knowledge of mathematics, basic science and engineering for solving the Computer Engineering problems ?(P01)

☐ 3

☐ 2

☐ 1

Q. 2 Do you able to Interpret, analyze and present the principles of mathematics, natural sciences, and engineering sciences and apply it to identify and formulate the Computer Engineering problem ?(P02)

☐ 3

☐ 2

☐ 1

Q. 3 Do you able to develop the processes & design the system to meet the specific needs with appropriate consideration for the public, cultural, societal and environmental issues ? **(P03)**

☐ 3

☐ 2

☐ 1

Q. 4 Do you able to Interpret, use and apply the research methods for analysis and synthesis of the information to provide valid conclusions ?**(P04)**

☐ 3

☐ 2

☐ 1

Q. 5 Do you able to recall ,Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools to design Computer Engineering systems activities with an understanding of the limitations of the tools ? **(P05)**

☐ 3

☐ 2

☐ 1

Q. 6 Do you able to apply appropriateness of computer engineering knowledge to assess the societal, health, safety, legal and cultural issues relevant to professional practices ?**(P06)**

☐ 3

☐ 2

☐ 1

Q. 7 Did you understand and demonstrate the impact of the professional engineering solutions in societal and environmental contexts?(P07)

☐ 3

☐ 2

☐ 1

Q. 8 Do you able to apply ethical principles and commit to professional ethics and responsibilities and norms of the computer engineering practice ?(P08)

☐ 3

☐ 2

☐ 1

Q. 9 Did you function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings? (P09)

☐ 3

☐ 2

☐ 1

Q. 10 Do you able to communicate effectively on complex engineering activities with the engineering community and with society by writing effective reports and design documentation, making effective presentations, and giving and receiving clear instructions ? (P010)

☐ 3

☐ 2

☐ 1

Q. 13 Do you able to Inculcate **professional skills**: The ability to understand, analyze and develop computer program for ubiquitous computing? **(PS01)**

- ☐ Excellent
 - ☐ Very Good
 - ☐ Good
 - ☐ Average
 - ☐ Poor
-

Q. 14 Do you able to Cultivate **employability and entrepreneurship**: The ability to promote innovative career paths to be an entrepreneur and for higher studies ?**(PS02)**

- ☐ Excellent
- ☐ Very Good
- ☐ Good
- ☐ Average

A. Please indicate your level of satisfaction:

1 - Low, 2 - Moderate, 3 - High

Description (optional)

1.Contents of the curriculum *

☐ 3

☐ 2

☐ 1

2.Effectiveness of Teaching – Learning process *

☐ 3

☐ 2

☐ 1

3.Adequacy of facilities *

☐ 3

☐ 2

☐ 1

4.Exposure to solve Engineering problems *

☐ 3

☐ 2

☐ 1

5.Efforts taken by Department for overall grooming and personality development *

☐ 3

☐ 2

☐ 1

B. Please provide following information

Description (optional)

1.Strength of the Program *

Short answer text

2.Opportunities for the improvements in the Department *

Short answer text

Academic Facility Feedback

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

1. Email *

2. Branch *

Mark only one oval.

- ☐ Computer Engineering
- ☐ Mechanical Engineering
- ☐ Artificial intelligence & Data Science
- ☐ Mechatronics
- ☐ Civil Engineering
- ☐ Robotics & AI

3. Class *

Mark only one oval.

- ☐ FE
- ☐ SE
- ☐ TE
- ☐ BE

4. 1. How much of syllabus was covered in the class? *

Mark only one oval.

- ☐ 85-100%
- ☐ 70-84%
- ☐ 55-69%
- ☐ 30-54%
- ☐ Below 30%

-
5. 2. How well did teachers adequately prepared for class? *

Mark only one oval.

- ☐ Thoroughly
- ☐ Satisfactorily
- ☐ Poorly

6. 3. How well were the teachers able to communicate? *

Mark only one oval.

- ☐ Always effective
- ☐ Sometime effective
- ☐ satisfactorily

7. 4. Teacher's approach towards teaching can be described as *

Mark only one oval.

- ☐ Excellent
- ☐ Good
- ☐ Fair

8. 5. Fairness of Internal Evaluation Process by the teacher *

Mark only one oval.

- ☐ Always Fair
- ☐ Sometimes Fair
- ☐ Always Unfair

9. 6. The institute Teachers take interest in promoting Internships, Industrial visits, field visit opportunities for students

Mark only one oval.

- ☐ Regularly
- ☐ most of the times
- ☐ sometimes

10. 7.TheTeaching and Mentoring Process in the institute facilitate you in cognitive, social and emotional growth.

Mark only one oval.

- ☐ Significantly
☐ Very well
☐ Moderately

11. 8.Teachers inform you about your expected Competencies, Course outcomes and Program outcomes *

Mark only one oval.

- ☐ Everytime
☐ Usually
☐ Sometimes

12. 9. Teachers illustrates the concepts through examples and applications *

Mark only one oval.

- ☐ Everytime
☐ Usually
☐ Sometimes

13. 10. The Teachers identify your strengths and encourage you with providing right level of challenges *

Mark only one oval.

- ☐ Everytime
☐ Usually
☐ Sometimes

14. 11. The Teachers identify your weakness and help you to overcome them. *

Mark only one oval.

- ☐ Everytime
☐ Usually
☐ Sometimes

15. 12. The Institute make efforts to engage students in the monitoring, review and continuous quality improvement of teaching learning process

Mark only one oval.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral

16. 13. Teachers encourage you to participate in extracurricular activities *

Mark only one oval.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral

17. 14. Efforts are made by the Institute/Teachers to improve soft skills, life skills and employability skills to make you ready for outside world to work.

Mark only one oval.

- ☐ To a great extent
- ☐ Moderate
- ☐ Some what

18. 15. What Percentage of Teachers use ICT Tools such as LCD Projectors ,Multimedia etc while teaching *

Mark only one oval.

- ☐ To a great extent
- ☐ Moderate
- ☐ Some what

19. 16. Teachers use student centric methods such as Experimental learning, Participative learning, Problem solving methodologies for enhancing learning experiences.

Mark only one oval.

- ☐ To a great extent
- ☐ Moderate
- ☐ Some what

20. 17. Overall Teaching Learning process in your institute is very good. *

Mark only one oval.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral

21. 18. The Institute Provides multiple opportunities to learn and grow *

Mark only one oval.

- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree

22. Any Suggestion

Ambience

23. Does Institute provides ICT enabled Smart Classrooms *

Mark only one oval.

☐ Yes

☐ No

24. Institute having Well-equipped laboratories *

Mark only one oval.

☐ Strongly Agree

☐ Agree

☐ Neutral

25. Institute has Computer labs with latest softwares *

Mark only one oval.

☐ Strongly Agree

☐ Agree

☐ Neutral

26. Institute provides Wi-fi facility in Campus *

Mark only one oval.

☐ Strongly Agree

☐ Agree

☐ Neutral

27. Library resources (books, journals, e-resources)

How satisfied are you with the availability and usefulness of library resources including books, journals, and e-resources?

Mark only one oval.

1 2 3

Poor ☐ ☐ ☐ Excellent

28. How are the Transport facilities at Institute? *

Mark only one oval.

☐ Excellent

☐ Good

☐ Fair

29. Institute has good Mess & Canteen facility *

Mark only one oval.

☐ Strongly Agree

☐ Agree

☐ Neutral

30. Institute has sufficient Medical facility. *

Mark only one oval.

☐ Strongly Agree

☐ Agree

☐ Neutral

31. Institute has adequate Sports facilities, equipments. *

Mark only one oval.

☐ Strongly Agree

☐ Agree

☐ Neutral

32. Institute has provided and maintained Green Campus & Cleanliness *

Mark only one oval.

☐ Strongly Agree

☐ Agree

☐ Neutral

33. Have you visited College Website? *

<https://mmit.edu.in>

Mark only one oval.

☐ Yes

☐ No,I will Visit.

Evaluation Rubric (Internship)

Marathwada Mitramandal's Institute of Technology, Pune

Towards Ubiquitous Computing Technology Department of Computer Engineering					
Rubrics for Internship TermWork					
Academic Year:					
Semester:					
Rubrics for TW					
Subject: Internship Class :					
Department : Computer Engineering					
Parameters	Max. Marks	Points			
Completion Certificate	50 Marks	25 Marks	25 Marks	-	-
		Time & Involvement Internship	Project Work & Skill Application	-	-
Internship Diary	10 Marks	5 Marks	5 Marks	-	-
		Proper and timely documented entries	Adequacy & quality of information recorded	-	-
Presentation	20 Marks	7 Marks	7 Marks	6 Marks	

		Communication and Presentation Skills	Learning Experience and Reflection	Attendance record	-
Report	20 Marks	5 Marks	5 Marks	5 Marks	5 Marks
		Domain knowledge and skill	Innovation/Creativity	Planning & Organizational skills	Report Format
Total marks	100				

Evaluation Rubric (Seminar)

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

Parameters	Max. Marks	Points			
Topic selection	5	5 Marks	4 Marks	(3/2) Marks	(1/0) Marks
		The topic selected by the student is relevant to the subject domain and demonstrate alignment with the stated learning objectives.	Relevant and appropriate topic selected.	The topic selected by the student is partially relevant to the subject	The topic selected by the student is not relevant to the subject
Reporting	10	(10-8) Marks	(7-5) Marks	(4-2) Marks	(1-0) Marks
		Progress is reported to the allocated guide on a regular basis.	Progress is reported to the allocated guide on a regular basis.	Progress is reported to the allocated guide irregularly.	Progress is reported to the allocated guide poorly
Performance + Report	10	(10-8) Marks	(7-5) Marks	(4-2) Marks	(1-0) Marks

		Performance and report meet given requirements.	Performance and report meet given requirements.	Performance and report meet given requirements in little extent..	Performance and report does not meet given requirements.
Presentation + Report	10	(10-8) Marks	(7-5) Marks	(4-2) Marks	(1-0) Marks
		Presentation is effective with proper documentation.	Presentation is good with documentation.	Presentation is ok with documentation.	Presentation is not effective with no proper documentation.
Topic understanding	5	5 Marks	4 Marks	(3/2) Marks	(1/0) Marks
		Good understanding of the topic is demonstrated.	Good understanding of the topic is demonstrated.	Poor understanding of the topic.	No understanding of the topic.
Question & Answer	10	(10-8) Marks	(7-5) Marks	(4-2) Marks	(1-0) Marks
		Questions are answered clearly and confidently.	Questions are answered clearly.	Questions are answered with less clarity.	Questions are not answered
Total marks	50				

Evaluation Rubric (Assignment)

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

Parameters	Max. Marks	Points			
Solution to Problem / Questions (S)	5	5 Marks	3 Marks	2 Marks	0 Marks
		Students solved all the questions with unique solution	Students solved all questions but no unique solution	Student copied answers of the questions	Student did not submitted
Understanding (U)	3	3 Marks	2 Marks	1 Marks	0 Marks
		Students solved all questions correctly with proper understanding	Students solved all questions with few correct answers shows good understanding	Students solved few questions with poor understanding	Students did not answer any questions, shows no understanding
Punctuality (P)	2	2 Marks	1 Marks	0 Marks	

		Students completed within time	Students submitted assignment after a stipulated time	Student not submitted assignment	
Total marks	10				

Rubrics For Continuous Evaluation For Practical/Oral/Lab Session

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

Parameters	Max. Marks	Rubric-wise Marks			
Experiment Execution	4	4	3	2	0
		Students are able to clearly understand and correctly execute the experiment as per the given problem statement without errors.	The student understands the experiment and executes it with minor errors or guidance.	The student partially understands the experiment and execution is incomplete or incorrect.	Students are unable to understand or execute the experiment.

Timely Completion	2	2	1	0	
		Experiment execution within the practical hour.	Experiment execution done with a minor delay (up to one week).	Not executed.	
Understanding of Experiment	2	2	1	0	
		Excellent understanding of objective, procedure, observations, and results; able to explain clearly.	Basic understanding with difficulty in explanation.	No understanding of the experiment.	
Journal/Write-up Completion	2	2	1	0	

with Accuracy & Neatness					
		Journal/writ e-up is complete, neat, well-organiz ed, and accurate.	The journal is complete with minor mistakes.	Journal not submitted or very poor.	
Total Marks	10				

Mini Project Evaluation Rubric

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

Parameter	Marks	Outstanding (4 to 5)	good(2 to 3)	Average/Poor (0 to 1)
Project selection	5	Extensive and detailed explanation of purpose and need of project	Average explanation of the purpose and need of project	Incomplete explanation of purpose and need of project
Objectives and methodology of project proposal	05	Well defined objectives Well defined steps to solve the problem	Average justification of the objectives. Methodology is specified but detailing is not done	Incomplete justification of objectives Methodology is unclear
Parameter	Marks	Outstanding (8-10 Marks)	good(5-7 Marks)	Average/Poor (0-4 Marks)
Design Methodology	10	Proper module division; correct tools/framework	Module division done; acceptable tools; limited	Poor module division; wrong/unclear tools; no

		k; strong justification	justification	justification
Parameter	Marks	Outstanding (4 to 5)	good(2 to 3)	Average/Poor (0 to 1)
Demonstration / Presentation	5	Clear, confident, and well-delivered presentation	Understandable but lacks clarity/confidence	Poor or unclear presentation
Project report		Project report is according to the given format. Key concepts and the technical aspects of the project are clearly described	Project report is according to the given format but is not well prepared	Project report is not according to the given format and is not well prepared

Rubric for Evaluation of Major Project /Final Year Project/Capstone Project

REVIEW #1

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

Topic selection (5 M)	Problem Definition (5 M)	Literature Survey Purpose and need of the project (5 M)	Justification of Project Objectives and Planning (5 M)	Project Scheduling & Distribution of Work among Team members (5 M)	Total (5 M)
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REVIEW #2

Quality of Software Requirements/ Specifications (20 M)	Quality Appropriateness and Accuracy of Design (20 M)	Total (20 M)
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REVIEW #3 (Bonde Madam)

Quality and accuracy of Software System/Model (25 M)	Individual Presentation (25 M)	Total (25 M)
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Rubric for Evaluation of Major Project /Final Year Project/Capstone Project

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

REVIEW #4

Quality and accuracy of Software System/Model (10 M)	Quality, appropriateness and accuracy of Testing (10 M)	Demonstration of software system /Module working and Functioning (10 M)	Results, Conclusion and Discussions (10 M)	Total (40 M)
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REVIEW #5

Identification of the social, environmental and ethical issues of the project problem (Project Participation) (20 M)	Paper Publication in good Journals or Conference (20 M)	Total (40 M)
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REVIEW #6

Group / Individual Presentation (10 M)	Style, structure, form and the perceived clarity with readability of report (10M)	Total (20M)
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Course Outcome Feedback/Course Exit Survey

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

Course End Survey

Roll

No.:

Student

Name:

Rate

the

course:

1

2

3

Low

☐☐☐

High

Rate the course content:

1

2

3

Low

☐☐☐

High

How much Course Outcome(CO) you attained?

	Low	Moderate	High
C01:	☐	☐	☐
C02:	☐	☐	☐
C03:	☐	☐	☐
C04:	☐	☐	☐
C05:	☐	☐	☐
C06:	☐	☐	☐

Rate the quality of assignment/quiz/test

	1	2	3	
Low	☐	☐	☐	High

Rate usefulness of course in learning new things

	1	2	3	
Low	☐	☐	☐	High

Rate the availability of course material

	1	2	3	
Low	☐	☐	☐	High

Which Course content needs to be focused more?

Which Content to be added in course (beyond the syllabus) that will help to learn new things?

Remark (if any)

Format for Gap Analysis Identified by Exit Students

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

To be taken by subject teacher from selected students of class at the end of course

Name of Student :	Department:
Class and Course:	Semester and Academic Year:
Subject:	Subject Code:

Unit No .	Course Contents	Suggested Addition of Topic	Suggested Removal of Topic
1.	Unit 1:		
2.	Unit 2:		
3.	Unit 3:		
4.	Unit 4:		
5.	Unit 5:		
6.	Unit 6:		

Format for Gap Analysis Identified by Employers/Industry Expert

Marathwada Mitramandal's Institute of Technology, Pune

Department of Computer Engineering

(To be taken by TPO for selected employers recommended by HOD)

Name of Student :	Department :
Class and Course :	Semester and Academic Year :
Subject :	Subject Code :

Unit No .	Course Contents	Suggested Addition of Topic	Suggested Removal of Topic
1.	Unit 1:		
2.	Unit 2:		
3.	Unit 3:		
4.	Unit 4:		
5.	Unit 5:		
6.	Unit 6:		

OBE Committee Members:

1. Dr. Subhash G. Rathod
2. Dr. Swapnil S.Chaudhari
3. Dr. Sanjay A. Agrawal
4. Prof. Dinesh B. Sartre
5. Prof. Tejaswini Bhoye
6. Prof. Uma Karanje