2.6.2. Attainment of Programme outcomes and course outcomes are evaluated by the institution (Describe the method of measuring the level of attainment of POs , PSOs and COs in not more than 200)

**Table 1. CO-PO and PSO Mapping of all the courses (2019-2023 Batch) – Anna University Regulation 2017**

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C101	HS8151-Communicative English						1.0	1.0		1.0	3.0		2.0		
C102	MA8151-Engineering Mathematics - I	3.0	3.0	1.0	1.0					2.0			1.0		
C103	PH8151-Engineering Physics	3.0	3.0	1.0		1.0					2.0				
C104	CY8151-Engineering Chemistry	3.0					1.0				1.0		1.0		
C105	GE8151-Problem Solving and Python Programming	2.4	2.6	2.6	2.6	1.8							2.0	2.8	1.0
C106	GE8152-Engineering Graphics	3.0	1.0	2.0		2.0					3.0		2.0	2.0	1.0
C107	GE8161-Problem Solving and Python Programming Laboratory	3.0	3.0	2.0	2.0	2.0	1.0	1.0		2.0	2.0		2.0	3.0	1.0
C108	BS8161-Physics and Chemistry Laboratory	3.0	1.0	1.0			1.0			2.0	2.0		1.0	2.0	1.0
C109	HS8251-Technical English									1.0	3.0		2.0		

Code	Course													
C110	MA8251-Engineering Mathematics - II	3.0	3.0	1.0	1.0					2.0			1.0		
C111	PH8253-Physics for Electronics Engineering	3.0	3.0	2.0	2.0	2.0	1.0	1.0		1.0	1.0		2.0	3.0	1.0
C112	BE8254-Basic Electrical and Instrumentation Engineering	3.0	3.0	2.0	3.0	3.0	1.0	1.0		2.0	1.0		2.0	3.0	2.0
C113	EC8251-Circuit Analysis	3.0	3.0	2.0	3.0	3.0	1.0	1.0		2.0	1.0		2.0	3.0	2.0
C114	EC8252-Electronic Devices	3.0	3.0	2.0	3.0	3.0	1.0	1.0		2.0	1.0		2.0	3.0	2.0
C115	EC8261-Circuits and Devices Laboratory	3.0	3.0	3.0	3.0	3.0	1.0	1.0	2.0	3.0	3.0	1.0	2.0	3.0	2.0
C116	GE8261-Engineering Practices Laboratory	3.0	2.0			1.0	1.0	1.0					2.0	2.0	1.0
C201	MA8352-Linear Algebra and Partial Differential Equations	3.0	3.0	2.0	3.0	3.0	1.0	1.0		2.0	1.0		2.0		
C202	EC8393-Fundamentals of Data Structures In C	3.0	3.0	2.0	3.0	3.0	1.0	1.0		2.0	1.0		2.0	3.0	2.0
C203	EC8351-Electronic Circuits- I	3.0	3.0	2.6	3.0	3.0	2.0	1.4		1.0	1.2		2.0	3.0	2.0
C204	EC8352-Signals and Systems	3.0	3.0	2.8	3.0	3.0	2.0	1.2		1.0	1.0		2.0	3.0	2.0
C205	EC8392-Digital Electronics	3.0	3.0	2.6	3.0	3.0	1.4	1.6		1.0	1.2		2.0	3.0	2.0
C206	EC8391-Control System Engineering	3.0	3.0	2.8	3.0	3.0	2.0	1.0		2.0	1.2		2.0	3.0	1.0
C207	EC8381-Fundamentals of Data Structures in C Laboratory	3.0	3.0	2.0	3.0	3.0	1.0	1.0	2.0	3.0	3.0	1.0	2.0	3.0	2.0
C208	EC8361-Analog and Digital Circuits Laboratory	3.0	3.0	2.0	3.0	3.0	1.0	1.0	2.0	3.0	3.0	1.0	2.0	3.0	2.0

C209	HS8381-Interpersonal Skills/Listening &Speaking	2.0	2.0	2.0	3.0	3.0	1.0	1.0	2.0	3.0	3.0	1.0	2.0	3.0	2.0
C210	MA8451-Probability and Random Processes	3.0	3.0	2.0	3.0	3.0	1.0	1.0		2.0	1.0		2.0		
C211	EC8452-Electronic Circuits II	3.0	3.0	2.6	3.0	3.0	2.0	1.4		1.0	1.2		2.0	3.0	2.0
C212	EC8491-Communication Theory	3.0	3.0	2.2	3.0	3.0	2.0	1.2		1.0	1.2		2.0	3.0	2.0
C213	EC8451-Electromagnetic Fields	3.0	3.0	3.0	3.0	3.0	2.0	1.0		1.0	1.0		2.0	3.0	2.0
C214	EC8453-Linear Integrated Circuits	3.0	3.0	2.0	3.0	3.0	2.0	1.4		1.0	1.0		2.0	3.0	2.0
C215	GE8291-Environmental Science and Engineering	3.0	3.0	1.0	3.0	3.0	2.0	1.4	2.0	1.0	1.0		2.0	3.0	2.0
C216	EC8461-Circuits Design and Simulation Laboratory	3.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0	3.0	3.0	1.0	2.0	3.0	2.0
C217	EC8462-Linear Integrated Circuits Laboratory	3.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0	3.0	3.0	1.0	2.0	3.0	2.0
C301	EC8501-Digital Communication	3.0	3.0	2.4	3.0	3.0	2.0	1.0		1.0	1.0		2.0	3.0	3.0
C302	EC8553-Discrete-Time Signal Processing	3.0	3.0	3.0	3.0	3.0	2.0	1.0		1.0	1.0		2.0	3.0	3.0
C303	EC8552-Computer Architecture and Organization	3.0	3.0	2.0	2.0	3.0	2.0	1.0		1.0	1.0		1.0	2.0	3.0
C304	EC8551-Communication Networks	3.0	3.0	2.2	2.0	3.0	2.0	1.0		1.0	1.0		1.0	2.0	3.0
C305	GE8077-Total	3.0	2.0	1.0	1.0	2.0	2.6		3.0	3.0	3.0	3.0	3.0		3.0

	Quality Management														
C306	OCE551-Air Pollution and Control Engineering	3.0	2.0	1.0	1.0	2.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0
C307	EC8562-Digital Signal Processing Laboratory	3.0	3.0	2.0	3.0	3.0	1.6		2.0	3.0	3.0	1.0	2.0	3.0	3.0
C308	EC8561-Communication Systems Laboratory	3.0	3.0	2.0	3.0	3.0	2.0		2.0	3.0	3.0	1.0	2.0	3.0	3.0
C309	EC8563-Communication Networks Laboratory	3.0	3.0	2.0	3.0	3.0	2.0		2.0	3.0	3.0	1.0	2.0	3.0	3.0
C310	EC8691-Microprocessors and Microcontrollers	3.0	3.0	3.0	3.0	3.0	2.0	1.0	1.0	1.0	1.0		2.0	3.0	3.0
C311	EC8095-VLSI Design	3.0	3.0	2.8	3.0	3.0	2.0	1.0	1.0	1.0	1.0		2.0	3.0	3.0
C312	EC8652-Wireless Communication	3.0	3.0	2.4	3.0	3.0	2.0	1.0		1.0	1.0		2.0	3.0	3.0
C313	MG8591-Principles of Management	3.0	2.0	1.0	1.0	2.0	2.0		3.0	3.0	3.0	3.0	3.0		3.0
C314	EC8651-Transmission Lines and RF Systems	3.0	3.0	3.0	3.0	3.0	1.6			1.0	1.0		2.0	3.0	3.0
C315	EC8002-Multimedia Compression and Communication	3.0	3.0	2.0	2.0	3.0	2.0			1.0	1.0		2.0	3.0	3.0
C316	EC8681-Microprocessors and Microcontrollers Laboratory	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	3.0
C317	EC8661-VLSI Design Laboratory	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	1.0	2.0	3.0	3.0
C318	EC8611-Technical Seminar	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	1.0	2.0	3.0	3.0
C319	HS8581-Professional Communication	3.0	3.0	3.0	3.0	3.0	2.0	2.0	1.0	1.0	1.0	1.0	2.0	3.0	3.0
C401	EC8701-Antennas and Microwave	3.0	3.0	3.0	3.0	3.0	2.0	2.0	1.0	1.0	1.0		2.0	3.0	3.0

Code	Course														
	Engineering														
C402	EC8751-Optical Communication	3.0	3.0	3.0	3.0	3.0	2.0	1.0	1.0	1.0	1.0		2.0	3.0	3.0
C403	EC8791-Embedded and Real Time Systems	3.0	3.0	3.0	3.0	3.0	2.0	2.0	1.0	1.0	1.0		2.0	3.0	3.0
C404	EC8702-Ad hoc and Wireless Sensor Networks	3.0	3.0	2.2	2.0	3.0	2.0			1.0	1.0		1.0	3.0	3.0
C405	CS8082-Machine Learning Techniques	3.0	3.0	3.0	2.0	2.0	2.0		1.0	1.0	1.0	1.0	2.0	2.0	2.0
C406	OCY751-Waste Water Treatment	3.0	3.0	3.0	2.0	2.0	3.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0
C407	EC8711-Embedded Laboratory	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	3.0
C408	EC8761-Advanced Communication Laboratory	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	3.0
C409	GE8076-Professional Ethics in Engineering	3.0	3.0	2.0	2.0	3.0	3.0		3.0	2.0	2.0		2.0	3.0	3.0
C410	EC8094-Satellite Communication	3.0	3.0	2.0	3.0	3.0	3.0	1.0	1.0	1.0	1.6		2.0	3.0	3.0
C411	EC8811-Project Work	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Average		2.97	2.84	2.26	2.65	2.77	1.83	1.31	1.86	1.83	1.81	1.52	1.95	2.86	2.35
% Contribution		99.13	94.78	75.25	88.45	92.28	60.94	43.64	62.07	60.92	60.23	50.79	65.05	95.38	78.18

Target levels of POs and PSOs (R-2017)
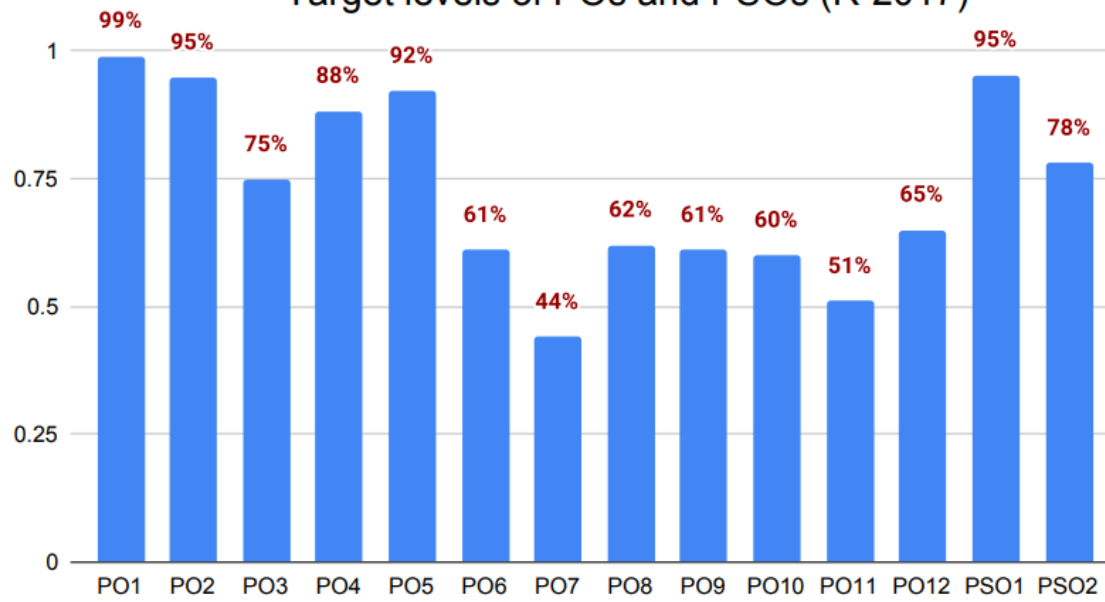
2.6.2.1 Attainment of Course Outcomes

A. List of Assessment Process

To evaluate the Course Outcomes, the data are gathered using the following process:

➤ **Theory courses:** Internal Assessment Tests (Cycle Tests), Model Examination, Assignments/Quiz/ Seminar, University Examinations, Course end survey

➤ **Practical Courses:** Regular evaluation of Laboratory exercise/experiment, Model examination, University examination, Course end survey

➤ **Project work:** Periodic reviews includes progress report, presentation and viva-voce, University viva-voce examination, course end survey
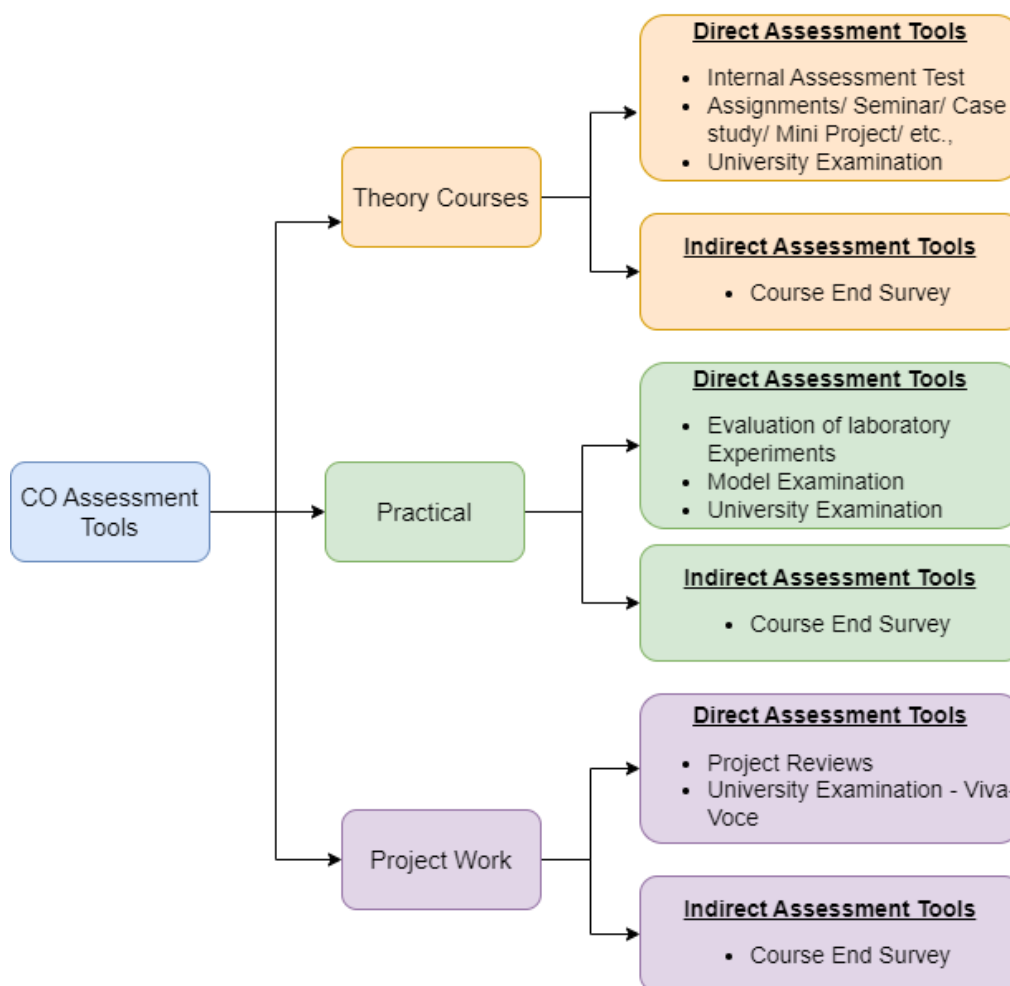
Figure 1 CO Assessment Tools

B. The quality /relevance of assessment processes & tools used

Mechanism of Internal Assessment (Theory Courses)

➤ The Internal Assessment Tests (CT 1, CT 2 & Model) are being scheduled as per the Academic Calendar.

- The Schedule of IA is circulated five days before to faculty members and students through HoD's.
- The Faculty members / Course Coordinators will prepare a Question Paper including Course Outcome (CO) and learning levels of Blooms' Taxonomy.
- These QPs will be audited by department IQAC Coordinator and submitted to HoD.
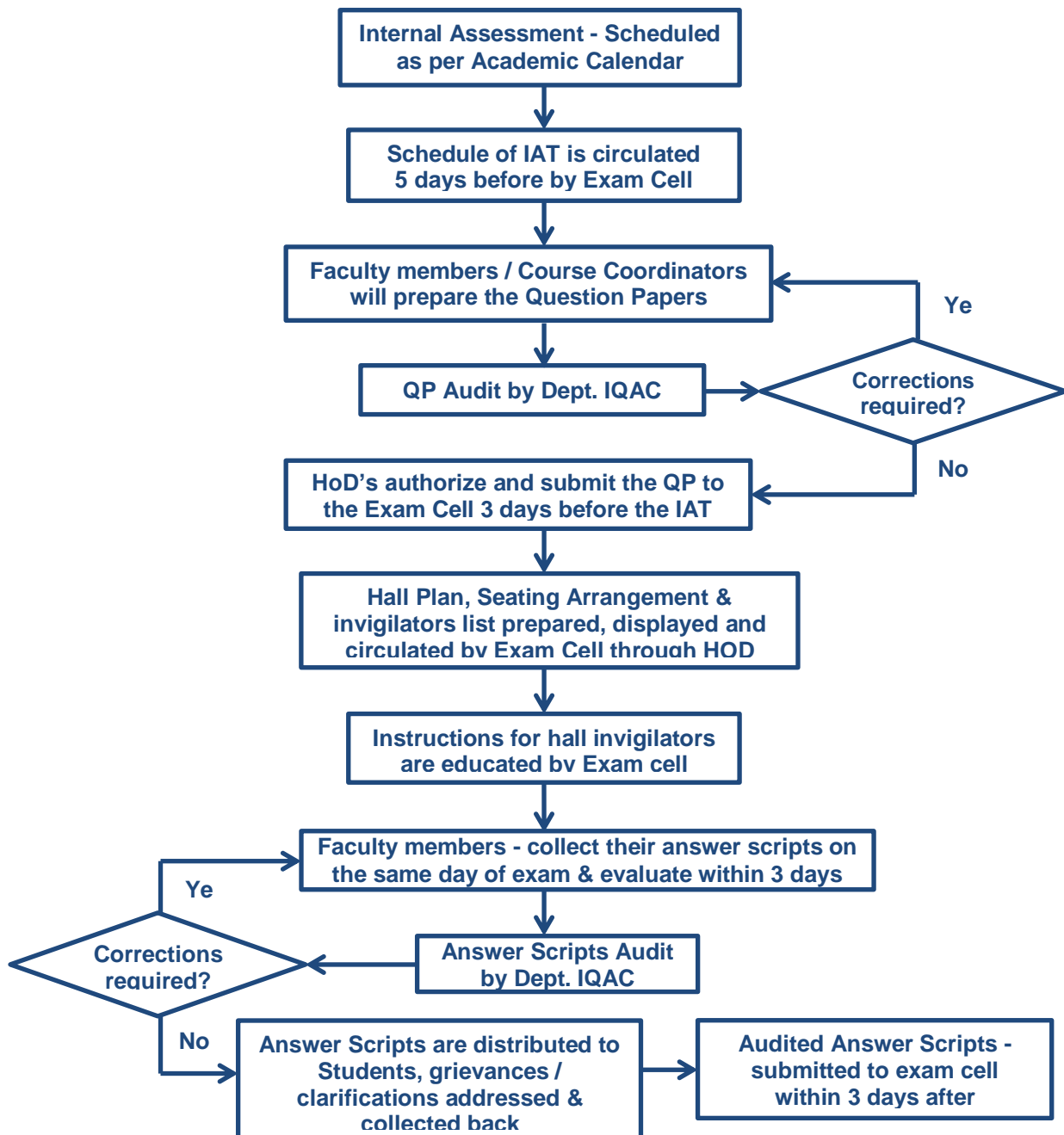
Figure 2 Mechanism of Internal Assessment (Theory Course)

- ➤ After the audit, HoD's will approve and submit the QPs to the Exam Cell on or before 3 days of commencement of IA.
- ➤ Exam Cell will prepare Hall Plan, Seating Arrangement and Hall Invigilators list before the commencement of IA.
- ➤ Hall invigilators list will be circulated to department faculty members 3 days in advance through HoD.
- ➤ Hall Plan will be displayed on the common Notice Board and Seating Arrangement will be displayed in the respective exam hall.
- ➤ Instructions for hall invigilators are as follows,
  - ● Hall invigilators are requested to report to the exam cell 15 minutes before the commencement of exam
  - ● Answer Papers should be collected by Hall invigilators as per Register Number order
  - ● Hall invigilators have to make alternate arrangements for exam duty in their absence and the same has to be informed to Exam Cell.
- ➤ The faculty has to collect their answer scripts on the same day of exam.
- ➤ The faculty has to prepare the Answer key of the relevant Question Paper.
- ➤ The faculty members should evaluate the answer scripts within 3 days after completion of respective exams and the same has to be audited by the department IQAC coordinator.
- ➤ Answer Scripts are distributed to the students. Any grievances / clarifications are to be addressed by the faculty in-charge/HOD.
- ➤ Audited Answer Scripts have to be submitted to the exam cell within 3 days after completion of IA.

Mechanism of Internal Assessment (Practical Courses)
- ➤ The laboratory experiments/exercises are evaluated regularly on completion of the experiment/exercise for 10 marks.
- ➤ The average of all the experiments/exercise is given 75% in internal mark calculation
- ➤ Model examination is conducted at the end of the semester.
- ➤ The mark obtained in model examination is given 25% in the internal mark calculation.

Mechanism of Internal Assessment (Project work)
- ➤ The project work is assessed using three reviews (each 100 Marks) during the semester.
- ➤ The students shall make a presentation on the progress made by them before the review committee.
- ➤ The total marks obtained in the three reviews shall be reduced for 20 marks and rounded to the nearest integer.
- ➤ **Review evaluation pattern:**
  - ● Zeroth review (R0): Zeroth review is conducted for approval of project title.
  - ● First review (R1): Presentation of literature survey is done to compare existing system and proposed plan of project, execution method and projection of simulation tools used.
  - ● Second review (R2): Design of the project, experimentation and implementation, results, compilation and report writing are verified.
  - ● Third review (R3): A model project viva voce is conducted for the complete presentation of the project. Draft project report to be submitted.

Overall CO Assessment Process:

S. No.	Assessment Process			Tools	Weightage
1.	Direct Assessment Process (DAP)	Theory Courses	Internal Assessment (IA) (60%)	Internal Assessment Test	90%
				Others (Assignment/ Quiz/Seminar/etc.,)	
			External Assessment (EA) (40%)	University Examinations	
		Laboratory Courses	Internal Assessment (IA) (60%)	Evaluation of Laboratory Observation, Record, Model Practical	
			External Assessment (EA) (40%)	University Examinations	
2.	Indirect Assessment Process (IAP)			Course End Feedback	10%

Direct Method:

Direct evaluation is done based on the student's performance in Internal Tests, Class assignments and activities like mini project, Case study, seminar, etc. This method is used to capture what a student has learned, or the quality of the learning, and analyze the performance.

- For all the internal tests, the respective faculty needs to prepare the question paper in order to cover as much as possible the course outcomes identified for the respective courses.

- The marks obtained in internal tests & University exams by the students are grouped into various bands which is ensured by the HOD.

- Goal is set for the program in terms of mark range and the percentage.

- Scores are attributed to different levels of overall performance as 1 or 2 or 3.

- The percentage of students obtaining the target is the CO attainment level.

- Weightage is given for internal exam, University performance and for the course end feedback. Considering all the three factors, the final score is arrived at for each course.

- The average aggregate of scores of all the courses is considered as attainment of COs of the programme.

Indirect Method:

Indirect method is a formative assessment where the feedback is collected from the students who completed the course. The feedback is based on set questions where the students can express their thoughts and skills they possess.

- All the students are administered a questionnaire.

- Questions are mapped to COs
- The ratings given by them are aggregated and overall % of rating is computed.

After evaluation with direct and indirect method, 90% weightage is given for results from direct assessment and 10% weightage is given for indirect assessment. The attainment of each CO is measured. If CO attainment reached the target, then the target will be increased for the subsequent years. Otherwise corrective measures will be taken.

C.   **Quality/relevance of assessment process and tools used**

Direct and Indirect Method – Assessment Tools and Frequency of assessment

Assessment Tool	Description	Evaluated By	Frequency
DIRECT ASSESSMENT			
Internal Assessment Test	A metric to continuously assess the attainment of course outcomes, student's learning domains and thus improve the teaching–learning process.	Respective Course In charge	Three times a semester
Continuous Lab Assessment	Used to evaluate whether student can implement the concepts learnt in theory through lab experiments	Respective Course In charge	Every lab hour
Theory / Practical Semester Examination	Metric to assess whether all the course outcomes are attained	University Evaluators	Once in a semester
Assignments, Presentation / Seminar, Mini project, etc.,	Tool to analyze the learning levels of the Students	Respective Course In charge	During the course delivery
INDIRECT ASSESSMENT			
Course End Feedback	Collect feedback from the students to assess outcome of the course at end of the semester	Course In-Charge	Once in a Semester
Programme Exit Feedback	Collect information from the students to assess themselves whether they attained the skills specified in PO and PSO	Class Advisor	Once in a year
Alumni Feedback	Collect information from the alumni to assess themselves whether they gained needed knowledge and skill for employability	Department Alumni Coordinator	Once in a year
Employer Feedback	Collect details from employers who hired students for their organization.	Placement Cell/ Department Placement Coordinator	Once in a year

Note: Target Percentage fixed for all the courses is 60%.
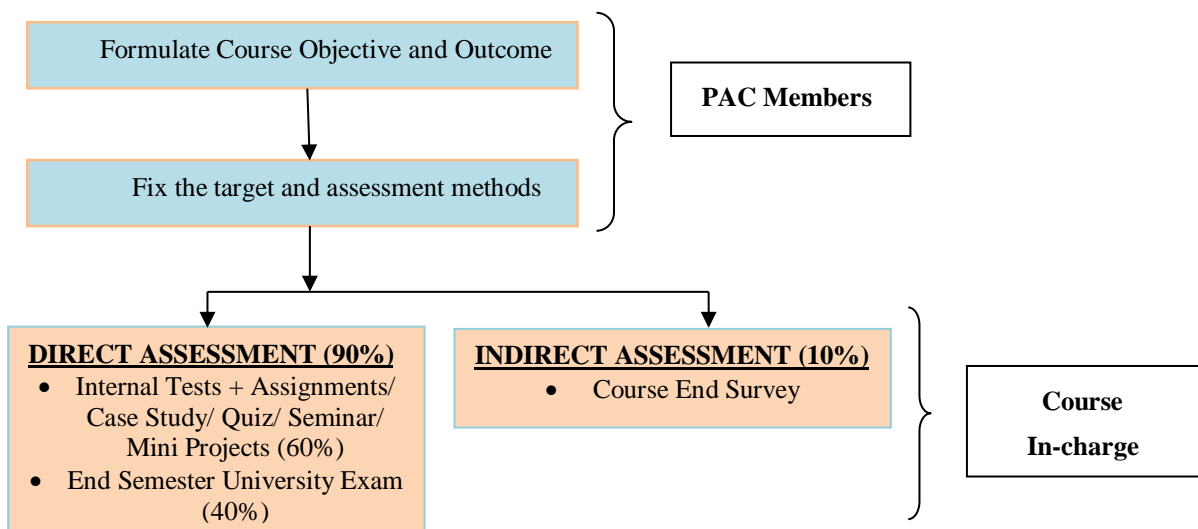
<u>**CO ASSESSMENT PROCESS**</u>

Figure 3 CO Assessment Process

DIRECT METHOD:

To assess CO attainment through direct method, three internal test marks, assignment marks and university result will be considered.

Attainment Through internal test:

Internal test question paper will be set based on the CO. Each internal test will cover more than one CO. Totally three tests will cover the entire COs in this format.

Internal exam / course outcome	CO1	CO2	CO3	CO4	CO5
Internal Assessment 1	*	*			
Internal Assessment 2			*	*	
Internal Assessment 3	*	*	*	*	*

For CO attainment, the marks scored by the individual student in individual question are considered. By calculating the % of questions asked from individual CO and the marks secured by the students will

be calculated. Each question is mapped to CO and appropriate marks will be awarded.

Similar tables will be prepared for three internal tests and assignments. From all the tests and assignments, marks for each CO are consolidated to 100 marks. After consolidating, it is observed whether the student has secured marks above the **target percentage**. **The Fixed Target Percentage for all courses is 60%.**

Once it is calculated for all the students, number of students who has reached the target percentage is considered. By calculating the percentage of students attained the target, attainment level will be calculated.

Target may be stated in terms of percentage of students getting more than 60% marks each of the associated COs in the assessment instruments (midterm tests, assignments, mini projects, reports and presentations etc. as mapped with the COs)

Measuring CO attainment through Internal Assessments:
Internal Assessment:
For Internal Assessment, the target is fixed based on summative manner i.e., by considering course performance through Internal Assessment Tests, Assignments and Project reviews, based on the need as described by the Course Instructor.
For Internal Assessment, the target is fixed based on the following criteria.
Attainment Level 1: 60% to 69% of students scoring more than 60% of marks in Internal Assessment.
Attainment Level 2: 70% to 79% of students scoring more than 60% of marks in Internal Assessment.
Attainment Level 3: >=80% of students scoring more than 60% of marks in Internal Assessment.

- Attainment is measured in terms of actual percentage of students getting set percentage of marks.
- If targets are achieved, then the C202.1 and C202.2 are attained for that year. Program is expected to set higher targets for the following years as a part of continuous improvement.
- If targets are not achieved the program should put in place an action plan to attain the target in subsequent years.

Attainment through University Results:

The University follows a grade system for awarding results for semester examinations; and calculates the attainment level. Also marks for individual questions are not known, the attainment level is considered as common for the entire COs.

The Fixed Target Percentages all the courses is 60%

Grade details for the Regulation 2017

Letter Grade	O	A+	A	B+	B	U/UA
Grade Point	10	9	8	7	6	0
Scale of 100	91-100	81-90	71-80	61-70	50-60	<50

In End Semester Exams, scoring 60% i.e. securing B grade is the target. The percentage of students who reached the target of the course is computed, in turn, the attainment level is calculated.

Measuring Course Outcomes attained through University Examinations

For cases where the university does not provide useful indicators like average or median marks etc., we may choose an attainment level on its own with justification. Target may be stated in terms of percentage of students getting more than 60% marks in the final examination.

Attainment Level 1: 60% to 69% of students scoring more than 60% of marks in final examination.

Attainment Level 2: 70% to 79% of students scoring more than 60% of marks in final examination.

Attainment Level 3: >=80% of students scoring more than 60% of marks in final examination

- Attainment is measured in terms of actual percentage of students getting set percentage of marks.
- If targets are achieved, then all the course outcomes are attained for that year. Program is expected to set higher targets for the following years as a part of continuous improvement.
- If targets are not achieved the program should put in place an action plan to attain the target in subsequent years.

The final CO attainment is calculated by allocating 40% weightage to University Examination and 60% weightage to Internal Assessment.

Attainment through Indirect Assessment:

CO attainment is calculated indirectly through the feedback provided by the students who complete the course and also from the feedback provided by the course In-Charge. The questions related to each CO

will be framed and the Course In-Charge and the students are asked to rate on the scale of 1 – 3.

    3 – Excellent

    2 – Good

    1– Satisfactory

Overall Course Outcome Attainment

After evaluating students using both direct and indirect attainment, overall attainment of the CO is calculated. **90% weightage is given for direct attainment and 10% weightage is given for indirect attainment** and the overall attainment is calculated for a scale of 3.

Target Percentage fixed for all the courses: 1.8 (60%)

(a)   **Calculation of Course Outcome Attainment Level (Sample Course Outcome for a Course)**

For the Course C403 & EC8791/Embedded and Real time Systems for the Batch 2019-23, the CO 2 Attainment is calculated as follows:

CO 2 Attainment = 90% score of Direct Assessment + 10% score of Indirect Assessment
- For **Direct Assessment**, the tools used are **Internal Assessment Tests (I, II & III), Assignments & University Examinations**.
- For **Indirect Assessment**, the tool used is **Course End Survey** is considered.

Direct Assessment:
- Attainment through Internal Assessment Test : **3**
- Attainment through Assignment : **3**
- Attainment through University Result : **3**

Direct Assessment of CO2 = 40% University Result + 60% Internal Assessment Test
$$= (0.4 * 3) + (0.6 * 3)$$
$$= 3$$

Indirect Assessment:
- Attainment through Course End Survey = 3

Indirect Assessment of CO2 = 100% Course End Feedback
$$= 1 * 3$$
$$= 3$$

Course Outcome Attainment:

CO 2 Attainment = 90% score of Direct Assessment + 10% score of Indirect Assessment
= (0.9 * 3) + (0.1 * 3)
= 3.0

OVERALL CO ATTAINMENT

After evaluating students using both direct and indirect attainment, overall attainment of the CO is calculated. **90% weightage is given for direct attainment and 10% weightage is given for indirect attainment** and the overall attainment is calculated for a scale of 3.

CARE COLLEGE OF ENGINEERING, TRICHY

DEPARTMENT OF ECE

Cycle Test I Analysis

AY 2022-23 : COURSE CODE & NAME: EC8791 - EMBEDDED & REALTIME SYSTEMS (R2017)

Faculty In-charge: Ms. R.DEEPALAKSHMI, AP/ECE

QUESTION SECTION			CT1 - PART A					CT1 - PART B												
QUESTION NUMBER			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8(a)(i)	Q8(a)(ii)	Q8(a)(iii)	Q8(b)(i)	Q8(b)(ii)	Q8(b)(iii)	Q9(a)(i)	Q9(a)(ii)	Q9(a)(iii)	Q9(b)(i)	Others (Assignment, Quiz, Seminar, Mini Project etc.)	Others (Assignment, Quiz, Seminar, Mini Project etc.)	TOTAL
ALLOTTEDTED MARKS			2	2	2	2	2	2	2	13			13			13			13	30	30	100
COURSE OUTCOME			1	1	1	2	2	2	2	1			1			2			2	1	2	
BT LEVELS [R,U,AP,AN,E,C]			R	U	R	R	R	U	U	U			AP			AP			AP	AP	AP	
S. No.	Reg. Number	Student Name																				
1	810719106001	Adithya P	2	2	2	2	2	2	2	12						4				30	28	88
2	810719106002	Ajay Kumar K	2	2	2	2	2	2	2	11						11				30	30	96
3	810719106003	Citybabu M	2	2	2	2	2	2	2	11						11				30	30	96
4	810719106004	Dhinakaran S	2	2	2	2	2	2	2	13						13				28	30	98
5	810719106005	Gunasekaran S		2	2	2	2						12			12				25	25	82
6	810719106006	Nishanth K	2	2	2	1	1	1	2	10						8				15	16	60
7	810719106008	Raja Rajeswari S	2	2	2	2	2	2	2	11						11				30	30	96
8	810719106009	Vijei R	2	2	2	2	2	2	2	10						11				30	30	95

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF ECE
Cycle Test II Analysis
AY 2022-23 : COURSE CODE & NAME: EC8791 - EMBEDDED & REALTIME SYSTEMS (R2017)
Faculty In-charge: Ms. R.DEEPALAKSHMI, AP/ECE

QUESTION SECTION			CT2 - PART A					CT2 - PART B								TOTAL MODEL
QUESTION NUMBER			Q1	Q2	Q3	Q4	Q5	Q6(a)	Q6(b)	Q7(a)	Q7(b)	Q8(a)	Q8(b)	Others (Assignment, Quiz, Seminar, Mini Project etc.)	Others (Assignment, Quiz, Seminar, Mini Project etc.)	
ALLOTTEDTED MARKS			2	2	2	2	2	13	13	13	13	14	14	25	25	100
COURSE OUTCOME			3	3	4	4	4	3	3	4	4	4	4	3	4	
BT LEVELS [R,U,AP,AN,E,C]			R	R	U	U	U	AP	AP	AP	AP	U	U	AP	AP	
S. No.	Reg. Number	Student Name														
1	810719106001	Adithya P	2	2	2	1	2		5	10		14		25	25	88
2	810719106002	Ajay Kumar K	2	2	2	2	2		11	13			14	25	25	98
3	810719106003	Citybabu M	2	2	2	2	2		11	13		14		25	25	98
4	810719106004	Dhinakaran S	2	2	2	2	2		12	12		14		25	25	98
5	810719106005	Gunasekaran S	2	2	2	2	2		12	10				25	25	82
6	810719106006	Nishanth K	2	2	2	2	2		4			6		25	25	70
7	810719106008	Raja Rajeswari S	2	2	2	2	2		12	13			12	25	25	97
8	810719106009	Vijei R	2	2	2	2	2		11	12			12	25	25	95

CARE COLLEGE OF ENGINEERING, TRICHY
DEPARTMENT OF ECE
Model Exam Analysis

			AY 2022-23 : COURSE CODE & NAME: EC8791 - EMBEDDED & REALTIME SYSTEMS (R2017)																							
			Faculty In-charge: Ms. R.DEEPALAKSHMI, AP/ECE																									
QUESTION SECTION			M1 - PART A										M1 - PART B										M1 - PART C		TOTAL
QUESTION NUMBER			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11 (a) (i)	Q11 (b) (i)	Q12 (a) (i)	Q12 (b) (i)	Q13 (a) (i)	Q13 (b) (i)	Q14 (a) (i)	Q14 (b) (i)	Q15 (a) (i)	Q15 (b) (i)	Q16 (a) (i)	Q16 (b) (i)	
ALLOTTEDTED MARKS			2	2	2	2	2	2	2	2	2	2	13	13	13	13	13	13	13	13	13	13	15	15	100
COURSE OUTCOME			1	1	2	2	3	3	4	4	5	5	1	1	2	2	3	3	4	4	5	5	4	5	
BT LEVELS [R,U,AP,AN,E,C]			R	U	R	U	U	R	R	U	R	U	U	U	U	U	U	U	U	U	AP	AP	AP	AP	
S. No.	Reg Number	Student Name																							
1	810719106001	Adithya P					2	2	2	2	2	2	13			13	13		13		13		8		85
2	810719106002	Ajay Kumar K	2	2	2	2	2	2	2	2	2	2	10			12	10		11		12		14		89
3	810719106003	Citybabu M	2			2	2	2	2	2	1		11			11	12		12		12		12		83
4	810719106004	Dhinakaran S	2	2	2	2	2	2	2	2	2	2	8			7	13		13		10		11		82
5	810719106005	Gunasekaran S					2	2	2	2	2		12			12	12		12		13		14		85
6	810719106006	Nishanth K	2	2	2			2	2				10			10	10		10		12		14		76
7	810719106008	Raja Rajeswari S	2	2	2	2	2	2	2	2	2	2	10			10	10		10		10		14		84
8	810719106009	Vijei R		1			1		1		1		13			13	12		12		12		14		80

S. No.	Reg. Number	Student Name	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	R	U	AP	AN	E	C	SCORED	ALLOTTED	TARGET	OVERALL
1	810719106001	Adithya P	4	14	43	0	0	0	61	62	98	4	13	4	4	32	0	57	64	89	8	13	30	0	0	0	51	59	86	0	36	43	0	0	0	79	90	88	2	2	13	0	0	0	17	17	100	90.8
2	810719106002	Ajay Kumar K	8	13	40	0	0	0	61	66	92	0	16	4	4	41	0	65	68	96	8	10	36	0	0	0	54	59	92	0	35	52	0	0	0	87	90	97	2	2	12	0	0	0	16	17	94	94.3
3	810719106003	Citybabu M	6	13	41	0	0	0	60	64	94	0	11	4	4	41	0	60	64	94	8	12	36	0	0	0	56	59	95	0	36	50	0	0	0	86	90	96	1	2	12	0	0	0	15	17	88	94.2
4	810719106004	Dhinakaran S	8	15	36	0	0	0	59	66	89	0	11	4	4	43	0	62	68	91	8	13	37	0	0	0	58	59	98	0	37	48	0	0	0	85	90	94	2	2	10	0	0	0	14	17	82	92.7
5	810719106005	Gunasekaran S	2	2	37	12	0	0	53	60	88	0	12	4	0	37	0	53	60	88	6	12	37	0	0	0	55	57	96	0	22	49	0	0	0	71	76	93	2	2	13	0	0	0	17	17	100	92.2
6	810719106006	Nishanth K	8	12	25	0	0	0	45	66	68	0	12	2	3	24	0	41	66	62	6	10	29	0	0	0	45	57	79	0	24	39	0	0	0	63	75	84	0	0	12	0	0	0	12	13	92	74.4
7	810719106008	Raja Rajeswari S	8	13	40	0	0	0	61	66	92	0	14	4	4	41	0	63	68	93	8	10	37	0	0	0	55	59	93	0	32	52	0	0	0	84	90	93	2	2	10	0	0	0	14	17	82	92.3
8	810719106009	Vijei R	5	12	43	0	0	0	60	64	94	0	13	4	4	41	0	62	64	97	5	12	36	0	0	0	53	57	93	0	31	51	0	0	0	82	88	93	1	0	12	0	0	0	13	15	87	93.8
No of Students Attended			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	

Set Target % :	60				
CO	1	2	3	4	5
Attainment %	100	100	100	100	100

L1	>=60% & < 70% STUDENTS SCORING MORE THAN SET TARGET PERCENTAGE
L2	>=70% & <80% STUDENTS SCORING MORE THAN SET TARGET PERCENTAGE
L3	>=80% STUDENTS SCORING MORE THAN SET TARGET PERCENTAGE)

Course Outcomes	Attainment	Attainment Level
CO1	100	3
CO2	100	3
CO3	100	3
CO4	100	3
CO5	100	3

S. No.	Reg. Number	Student Name	GRADE
CARE COLLEGE OF ENGINEERING, TRICHY		
	DEPARTMENT OF ECE		
	END SEMESTER RESULT ANALYSIS		
	AY 2022-23 : COURSE CODE & NAME: EC8791 - EMBEDDED & REALTIME SYSTEMS (R2017)		
	Faculty In-charge: Ms. R.DEEPALAKSHMI, AP/ECE		
	Set Target %		60
	ALLOTED MARKS		100
S. No.	Reg. Number	Student Name	GRADE
1	810719106001	Adithya P	A
2	810719106002	Ajay Kumar K	O

Grade B

3	810719106003	Citybabu M	A
4	810719106004	Dhinakaran S	A+
5	810719106005	Gunasekaran S	A
6	810719106006	Nishanth K	B+
7	810719106008	Raja Rajeswari S	A+
8	810719106009	Vijei R	A+

O	100	1
A+	90	6
A	80	3
B+	70	1
B	60	0
U	LESSTHAN 50	0
UA	UA	0
No of Students Attended		11
ATTAINMENT %		100
Course Outcomes	**ATTAINMENT LEVEL**	
CO1	3	
CO2	3	
CO3	3	
CO4	3	
CO5	3	

ATTAINMENT LEVEL

L1	>=60% & < 70% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENTAGE)
L2	>=70% & <80% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENTAGE)
L3	>=80% STUDENTS SCORING MORE THAN SET TARGET (CLASS AVERAGE / PERCENTAGE)

DEPARTMENT OF ECE

Course End Survey

Branch: ECE

Course Code & Name:	EC8791 - EMBEDDED & REALTIME SYSTEMS (R2017)	**Sem:** VII

Faculty In-charge: Ms. R.DEEPALAKSHMI, AP/ECE   **AY: 2022 - 23**

Course Outcome	Student								Attainment
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Average**
CO1	3	3	3	3	1	3	2	3	**2.73**
CO2	2	3	2	2	3	3	2	2	**3.00**
CO3	2	3	3	2	3	2	3	2	**3.00**
CO4	3	2	2	1	3	2	2	3	**2.73**
CO5	2	1	3	2	3	2	2	3	**2.73**

Students will able to

CO1	**Explain** Embedded System Design and Methodologies **(K2)**
CO2	**Discuss** ARM Processor Architecture and Peripherals **(K2)**
CO3	**Describe** the concepts of Embedded Programming **(K3)**
CO4	**Discuss** concepts of real-time operating system design **(K2)**
CO5	**Model** real-time applications using embedded-system concepts **(K3)**

**Course Outcome
Attainment (R2017)**

COURSE OUTCOME	Direct		Indirect	CO Attainment = (Internal *0.60+Univ*0.40)*0.90+Indirect*0.10)
	Internal Assessment	University Exams		
CO 1	3.00	3	2.73	2.97
CO 2	3.00	3	3.00	3.00
CO 3	3.00	3	3.00	3.00
CO 4	3.00	3	2.73	2.97
CO 5	3.00	3	2.73	2.97

Mapping course outcome with programme outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	2	2	1	1	1		2	3	3
CO2	3	3	3	3	3	2	2	1	1	1		2	3	3
CO3	3	3	3	3	3	2	2	1	1	1		2	3	3
CO4	3	3	3	3	3	2	2	1	1	1		2	3	3
CO5	3	3	3	3	3	2	2	1	1	1		2	3	3

Record the attainment of Course Outcomes of all courses with respect to set attainment levels

Table.2 CO attainment of all courses – Anna University Regulation 2017 (2019-23 BATCH)

Course Code	Course Name	CO1	CO2	CO3	CO4	CO5	Average	Target Value	CO Attained / Not Attained
C101	HS8151-Communicative English	2.97	2.94	2.97	3.00	3.00	2.98	1.80	Attained
C102	MA8151-Engineering Mathematics - I	1.92	1.92	1.92	1.92	1.92	1.92	1.80	Attained
C103	PH8151-Engineering Physics	2.97	2.94	2.97	2.97	3.00	2.97	1.80	Attained
C104	CY8151-Engineering Chemistry	1.92	1.89	1.92	1.92	1.92	1.91	1.80	Attained
C105	GE8151-Problem Solving and Python Programming	2.97	3.00	3.00	3.00	3.00	2.99	1.80	Attained
C106	GE8152-Engineering Graphics	2.97	2.97	3.00	3.00	3.00	2.99	1.80	Attained
C107	GE8161-Problem Solving and Python Programming Laboratory	3.00	2.97	3.00	3.00	3.00	2.99	1.80	Attained
C108	BS8161-Physics and Chemistry Laboratory	3.00	2.97	3.00	2.91	3.00	2.98	1.80	Attained
C109	HS8251-Technical English	2.97	2.94	2.97	3.00	3.00	2.98	1.80	Attained
C110	MA8251-Engineering Mathematics - II	1.92	1.92	1.92	1.92	1.92	1.92	1.80	Attained
C111	PH8253-Physics for Electronics Engineering	1.89	1.86	1.89	1.89	1.92	1.89	1.80	Attained
C112	BE8254-Basic Electrical and Instrumentation Engineering	1.92	1.89	1.92	1.83	1.92	1.90	1.80	Attained
C113	EC8251-Circuit Analysis	1.92	1.89	1.92	1.92	1.92	1.91	1.80	Attained
C114	EC8252-Electronic Devices	1.89	1.92	1.92	1.92	1.92	1.91	1.80	Attained
C115	EC8261-Circuits and Devices Laboratory	2.97	2.97	3.00	3.00	3.00	2.99	1.80	Attained
C116	GE8261-Engineering Practices Laboratory	3.00	2.97	3.00	3.00	3.00	2.99	1.80	Attained
C201	MA8352-Linear Algebra and Partial Differential Equations	1.89	1.87	1.89	1.92	1.92	1.90	1.80	Attained
C202	EC8393-Fundamentals of Data Structures In C	3.00	2.97	3.00	3.00	3.00	2.99	1.80	Attained
C203	EC8351-Electronic Circuits-I	1.92	1.89	1.92	1.84	1.92	1.90	1.80	Attained
C204	EC8352-Signals and Systems	1.92	1.89	1.92	1.92	1.92	1.91	1.80	Attained
C205	EC8392-Digital Electronics	1.89	1.92	1.92	1.92	1.92	1.91	1.80	Attained
C206	EC8391-Control System Engineering	1.89	1.89	1.92	1.92	1.92	1.91	1.80	Attained

C207	EC8381-Fundamentals of Data Structures in C Laboratory	2.97	2.95	2.97	2.97	3.00	2.97	1.80	Attained
C208	EC8361-Analog and Digital Circuits Laboratory	3.00	3.00	3.00	3.00	3.00	3.00	1.80	Attained
C209	HS8381-Interpersonal Skills/Listening &Speaking	2.97	2.95	2.97	2.97	3.00	2.97	1.80	Attained
C210	MA8451-Probability and Random Processes	2.97	2.95	2.95	2.97	3.00	2.97	1.80	Attained
C211	EC8452-Electronic Circuits II	2.97	2.97	3.00	2.95	2.95	2.97	1.80	Attained
C212	EC8491-Communication Theory	2.97	3.00	3.00	3.00	3.00	2.99	1.80	Attained
C213	EC8451-Electromagnetic Fields	3.00	2.97	2.97	3.00	3.00	2.99	1.80	Attained
C214	EC8453-Linear Integrated Circuits	2.97	2.97	3.00	2.97	3.00	2.98	1.80	Attained
C215	GE8291-Environmental Science and Engineering	2.97	2.97	3.00	3.00	3.00	2.99	1.80	Attained
C216	EC8461-Circuits Design and Simulation Laboratory	3.00	3.00	3.00	3.00	3.00	3.00	1.80	Attained
C217	EC8462-Linear Integrated Circuits Laboratory	3.00	3.00	3.00	3.00	3.00	3.00	1.80	Attained
C301	EC8501-Digital Communication	3.00	2.97	2.97	2.89	2.92	2.95	1.80	Attained
C302	EC8553-Discrete-Time Signal Processing	3.00	2.97	2.97	2.95	2.95	2.97	1.80	Attained
C303	EC8552-Computer Architecture and Organization	3.00	2.97	2.97	2.97	2.97	2.98	1.80	Attained
C304	EC8551-Communication Networks	2.97	2.97	3.00	2.95	2.95	2.97	1.80	Attained
C305	GE8077-Total Quality Management	3.00	2.97	2.97	2.97	2.97	2.98	1.80	Attained
C306	OCE551-Air Pollution and Control Engineering	3.00	2.97	3.00	2.95	2.97	2.98	1.80	Attained
C307	EC8562-Digital Signal Processing Laboratory	3.00	2.95	2.97	2.95	2.95	2.96	1.80	Attained
C308	EC8561-Communication Systems Laboratory	3.00	2.95	2.97	2.92	2.92	2.95	1.80	Attained
C309	EC8563-Communication Networks Laboratory	3.00	2.97	2.97	2.97	2.97	2.98	1.80	Attained
C310	EC8691-Microprocessors and Microcontrollers	3.00	3.00	2.95	2.97	2.95	2.97	1.80	Attained
C311	EC8095-VLSI Design	3.00	2.97	2.97	2.89	2.92	2.95	1.80	Attained
C312	EC8652-Wireless Communication	3.00	2.95	2.97	2.92	2.92	2.95	1.80	Attained
C313	MG8591-Principles of Management	2.97	2.92	3.00	2.92	2.92	2.95	1.80	Attained

C314	EC8651-Transmission Lines and RF Systems	3.00	2.95	2.97	2.95	2.95	2.96	1.80	Attained
C315	EC8002-Multimedia Compression and Communication	2.96	2.95	2.95	2.93	2.92	2.94	1.80	Attained
C316	EC8681-Microprocessors and Microcontrollers Laboratory	3.00	2.97	2.97	2.95	2.95	2.97	1.80	Attained
C317	EC8661-VLSI Design Laboratory	3.00	2.95	2.97	2.95	2.95	2.96	1.80	Attained
C318	EC8611-Technical Seminar	3.00	2.95	2.97	2.92	2.92	2.95	1.80	Attained
C319	HS8581-Professional Communication	2.97	2.95	2.97	2.95	2.95	2.96	1.80	Attained
C401	EC8701-Antennas and Microwave Engineering	2.97	2.97	3.00	2.92	2.92	2.96	1.80	Attained
C402	EC8751-Optical Communication	2.97	2.97	2.97	2.97	2.97	2.97	1.80	Attained
C403	EC8791-Embedded and Real Time Systems	2.97	3.00	3.00	2.97	2.97	2.98	1.80	Attained
C404	EC8702-Ad hoc and Wireless Sensor Networks	2.97	2.97	3.00	2.92	2.95	2.96	1.80	Attained
C405	CS8082-Machine Learning Techniques	2.97	2.97	3.00	2.92	2.92	2.96	1.80	Attained
C406	OCY751-Waste Water Treatment	2.97	2.43	3.00	2.92	2.92	2.85	1.80	Attained
C407	EC8711-Embedded Laboratory	3.00	2.97	3.00	2.95	2.97	2.98	1.80	Attained
C408	EC8761-Advanced Communication Laboratory	3.00	2.95	3.00	2.95	2.95	2.97	1.80	Attained
C409	GE8076-Professional Ethics in Engineering	2.97	2.97	3.00	2.92	2.38	2.85	1.80	Attained
C410	EC8094-Satellite Communication	2.43	2.97	3.00	2.92	2.38	2.74	1.80	Attained
C411	EC8811-Project Work	3.00	3.00	3.00	3.00	3.00	3.00	1.80	Attained

Attainment of Program Outcomes and Program Specific Outcomes
1. Describe assessment tools and processes used for measuring the attainment of each of the Program Outcomes and Program Specific Outcomes
    A. List of assessment tools & processes

Attainment Method	Attainment Tool	PO/PSO attainment contribution
Direct Attainment	Course Outcome attainment level	60%
	Project work	20%
Indirect Attainment	Co-curricular and Extra-curricular activities	5%
	Program Exit Feedback	5%
	Alumni Feedback	5%
	Employer Feedback	5%

The above mentioned Feedback Forms are collected from the students, Alumni and Employer for the indirect assessment.

PAC Members decide the month in which Students Programme Exit Feedback, Alumni Feedback and Employer Feedback have to be collected.

PO OVERALL ATTAINMENT:

Target % = PO1-PO5+ PSO1+ PSO2 = 70% (or) 2.1 and PO6-PO12 = 60% (or) 1.8

Similar to CO attainment, overall PO attainment is calculated as:

Overall attainment = Direct Assessment (60 % of Courses +20% Projects + 5% of Co-Extra Curricular Activities) + Indirect Assessment (5% of Programme Exit Feedback + 5% Alumni Feedback + 5% of Employer Feedback)

PSO attainment is also calculated in the same manner.
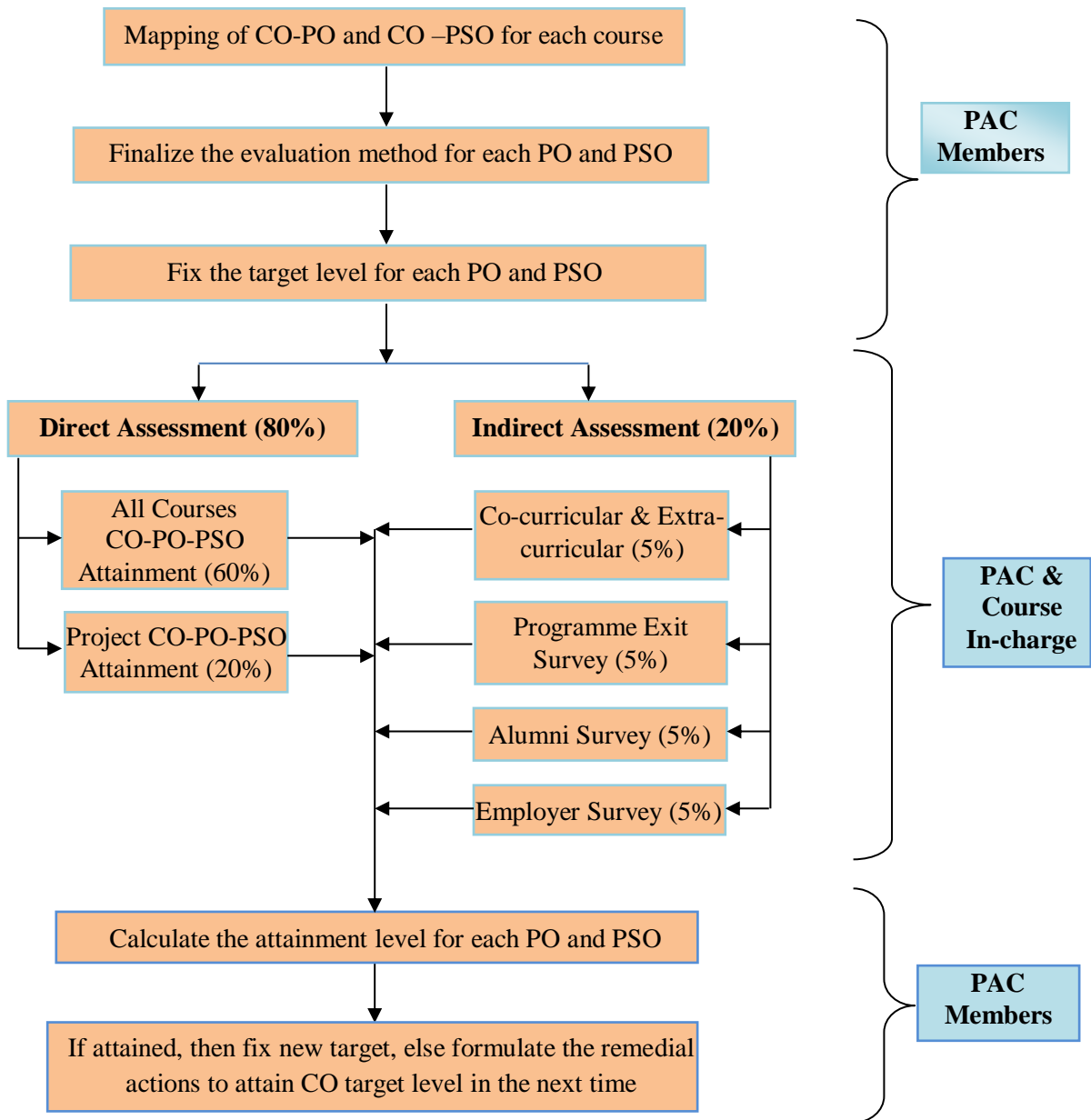
FIGURE 4. PO & PSO Attainment Process

B. The quality/relevance of assessment tools/processes used
- **Direct Assessment of PO/PSO (80%)**
  - CO-PO-PSO Attainment of all Courses except Project work has been calculated based as per table 3.2.2 (a) (60% Weightage)
  - Project Work CO-PO-PSO Attainment (20% Weightage)
- **Indirect Assessment of PO/PSO (20%)**
  - **Program Exit Feedback (5% Weightage):** A program exit feedback is collected from the students, who have completed the course in the corresponding year. This feedback is collected to assess how far the students gained the knowledge with respect to each PO and PSO.

CONSOLIDATION OF PROGRAM EXIT FEEDBACK:

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)
TIRUCHIRAPPALLI - 620009

DEPARTMENT OF ECE

Programme Exit Survey

Branch: ECE   **Batch: 2019-23, Even Semester**

Student	Course Outcome													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	3	3	3	3	2	3	2	2	2	2	2	3
2	2	3	2	2	3	3	2	2	1	3	3	2	3	3
3	2	3	3	2	3	2	3	2	3	2	3	3	3	2
4	3	1	2	1	3	1	2	3	2	3	2	3	3	3
5	2	1	3	1	3	1	2	3	2	2	2	3	2	2
6	3	3	3	3	3	3	2	3	2	2	2	2	2	3
7	2	3	2	2	3	3	2	2	1	3	3	2	3	3
8	2	3	3	2	3	2	3	2	3	2	3	3	3	2
Average	**3.00**	**2.18**	**3.00**	**2.18**	**3.00**	**2.18**	**3.00**	**3.00**	**2.18**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**
5% Contribution	**0.15**	**0.11**	**0.15**	**0.11**	**0.15**	**0.11**	**0.15**	**0.15**	**0.11**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**

o **Alumni Feedback (5% Weightage):** Feedback is collected from the alumni to assess how far the programs are useful for the alumni to meet the expectations of the working environment or higher studies. It is useful to make necessary improvements in the academic activities.

CONSOLIDATION OF ALUMNI FEEDBACK:

DEPARTMENT OF ECE

Alumni Feedback

Branch: ECE   **Batch: 2019-23**

Student	Course Outcome													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	3	3	3	3	2	3	2	2	2	2	2	3
2	3	2	2	2	3	3	2	2	1	3	3	2	3	3
3	3	2	3	2	3	2	3	2	3	2	3	3	3	2
4	3	3	2	2	3	2	2	3	2	3	2	3	3	3
5	3	2	3	2	3	2	2	3	2	2	2	3	2	2
6	3	2	3	3	3	3	2	3	2	2	2	2	2	3
7	3	2	3	2	3	2	3	2	3	2	3	3	3	2
8	3	2	2	2	3	3	2	2	1	3	3	2	3	3
Average	**3.00**	**3.00**	**3.00**	**2.73**	**3.00**	**2.73**	**3.00**	**3.00**	**2.45**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**
5% Contribution	**0.15**	**0.15**	**0.15**	**0.14**	**0.15**	**0.14**	**0.15**	**0.15**	**0.12**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**

o **Employer Feedback (5% Weightage):** Once in a year, feedback is collected from the employers to assess their judgment about the working efficiency of the graduates in various aspects related to the industries which are useful to evaluate the attainment of POs and PSOs.

CONSOLIDATION OF EMPLOYER FEEDBACK:

CARE
COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

TIRUCHIRAPPALLI - 620009

Employers Feedback

Branch: ECE   **Batch: 2019-23**

Student	Course Outcome													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
1	3	3	3	3	3	2	3	3	2	2	2	2	3	3
2	2	2	2	2	3	2	3	2	1	3	3	2	2	2
3	2	2	2	2	3	2	2	2	3	2	3	3	2	2
4	3	3	3	3	3	1	1	3	2	3	2	3	3	3
5	2	2	2	2	3	1	1	3	2	2	2	3	2	2
6	3	3	3	3	3	2	3	3	2	2	2	2	3	3
7	2	2	2	2	3	3	3	2	1	3	3	2	2	2
8	2	2	2	2	3	2	2	2	3	2	3	3	2	2
Average	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**2.33**	**2.33**	**3.00**	**2.33**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**
5% Contribution	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.12**	**0.12**	**0.15**	**0.12**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**

o **Co-curricular and extracurricular activities (5% Weightage):**
Co-curricular and extracurricular activities are essential elements of a well-rounded education. They offer a platform for students to explore their interests, develop skills, and grow as individuals, enriching their educational journey beyond the classroom. Every year, these kinds of activities are conducted and assess the student's ability for various skill developments which are also useful to attainment of POs and PSOs.

CARE
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TIRUCHIRAPPALLI - 620009

DEPARTMENT OF ECE

CO-Curricular and Extra Curricular activities

S. No.	Co-Curricular Activities	Fair (1)	Good (2)	Excellent (3)	Program / Event Details	Assessment
1	Guest Lecturers	Program organizes 1-2 Guest Lecturers	Program Organizes 3-4 Lecturers	Program Organizes 5 or more Guest Lectures	Guest Lectures more than 5	3
2	MOOCS online courses (NPTEL, SWAYAM, MOODLES Etc.,)	2% of students Registered	more than 10% of students Registered	20% of students Registered	2% of students Registered	1
3	Demonstration of Projects in Exhibition	= 1	= 2	> 2	2	2
4	Students' Seminar, workshop & English Communication Hours	Less than 10% Program Students' Participate	15% Students Participate	Above 30% Students' Participate	Above 30%	3
5	Program on Environment/ Sustainability Organized	= 1	= 2	>= 3	1	1
6	Library/Internet Hours	= 1 hour	= 2 hours	>= 3 hours	1 hour	1
7	Project Management & Finance Guest Lecturers	= 1	= 2	>= 3	1	1
8	Soft skill Training Program on design practices	= 1	= 2	>= 3	More than 3 Programs	3

S.No	Extra-Curricular Activities	Fair (1)	Satisfactory (2)	Good (3)	Program / Event Details	Assessment
1	Ethical Practices – Like Honesty Shops, Yoga, etc.,)	= 1	= 2	>= 3	1	1
2	Social Awareness through NSS Activities – % Student participation	5%	10%	>= 25%	> 25%	3
3	Industry Internship Program	= 1	= 2	>= 3	3	3
4	Entrepreneurships – Lecturers	= 1	= 2	>= 3	1	1
5	Programs on Health or Course on Human Anatomy	10% of students	20% of students	25% of Students	NIL	0
6	Programs on Safety Engineering	= 1	= 2	>= 3	1 Program	0
7	Programs on Intellectual Property Rights	= 1	= 2	>= 3	1	1
8	Students' Participation in Sports & Cultural Events	=1	= 2	>=3	2	2

S.No	Co-Curricular Activities	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	Guest Lecturers	3	3	1	2	2	1				1		1	3	2
2	MOOCS online courses (NPTEL, SWAYAM, MOODLES Etc.,)	1	1										1		
3	Demonstration of Projects in Exhibition	2	2	2	2		2		1	3	3	1	2	2	2
4	Students' Seminar, workshop & English Communication Hours									1	1				1
5	Program on Environment/ Sustainability Organized							1		1	1				
6	Library/Internet Hours												1	1	1
7	Project Management & Finance Guest Lecturers											1	1		1
8	Soft skill Training Program on design practices					2	1		1	1	1		2	2	2

S.No	Extra-Curricular Activities	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	Ethical Practices – Like Honesty Shops, Yoga, etc.,)						1	1	1				2		
2	Social Awareness through NSS Activities – % Student participation						2	2	2	2	2		2		
3	Industry Internship Program														
4	Entrepreneurships – Lecturers											1			
5	Programs on Health or Course on Human Anatomy								1				1		
6	Programs on Safety Engineering								1				1		
7	Programs on Intellectual Property Rights						1								
8	Students' Participation in Sports & Cultural Events								3	2	2		3		
	PO ATTAINMENTS	2.00	2.00	1.50	2.00	2.00	1.33	1.33	1.43	1.67	1.57	1.00	1.55	2.00	1.50
	5% Contribution	0.10	0.10	0.08	0.10	0.10	0.07	0.07	0.07	0.08	0.08	0.05	0.08	0.10	0.08

Table 3 CO-PO and PSO attainment of all the courses (2019-2023 Batch) – Anna University Regulation 2017

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C101	HS8151-Communicative English						0.99	0.99		0.99	2.98		1.98		
C102	MA8151-Engineering Mathematics - I	1.92	1.92	0.64	0.64					1.28	0.64		0.64		
C103	PH8151-Engineering Physics	2.97	2.97	0.99		0.99					1.98				
C104	CY8151-Engineering Chemistry	1.91					0.64				0.64	0.64	0.64		
C105	GE8151-Problem Solving and Python Programming	2.39	2.59	2.59	2.59	1.80						1.60	0.80	2.79	1.00
C106	GE8152-Engineering Graphics	2.99	1.00	1.99		1.99					2.99		1.99	1.99	1.00
C107	GE8161-Problem Solving and Python Programming Laboratory	2.99	2.99	2.00	2.00	2.00	1.00	1.00		2.00	2.00		2.00	2.99	1.00
C108	BS8161-Physics and Chemistry Laboratory	2.98	0.99	0.99			0.59			1.98	1.98	1.98	0.99	1.98	0.99
C109	HS8251-Technical English						0.99	0.40		0.99	2.98		1.98		
C110	MA8251-Engineering Mathematics - II	1.92	1.92	0.64	0.64					1.28	0.64		0.64		
C111	PH8253-Physics for Electronics Engineering	1.89	1.89	1.26	1.26	1.26	0.63	0.63		0.63	0.63		1.26	1.89	0.63
C112	BE8254-Basic Electrical and Instrumentation Engineering	1.90	1.90	1.26	1.90	1.90	0.63	0.63		1.26	0.63		1.26	1.90	1.26
C113	EC8251-Circuit Analysis	1.91	1.91	1.28	1.91	1.91	0.64	0.64		1.28	0.64		1.28	1.91	1.28
C114	EC8252-Electronic Devices	1.91	1.91	1.28	1.91	1.91	0.64	0.64		1.28	0.64		1.28	1.91	1.28
C115	EC8261-Circuits and Devices Laboratory	2.99	2.99	2.99	2.99	2.99	1.00	1.00	1.99	2.99	2.99	1.00	1.99	2.99	1.99
C116	GE8261-Engineering Practices Laboratory	2.99	2.00			1.00	1.00	1.00					2.00	2.00	1.00
C201	MA8352-Linear Algebra	1.90	1.90	1.27	1.90	1.90	0.63	0.63		1.27	0.63		1.27		

	and Partial Differential Equations													
C202	EC8393-Fundamentals of Data Structures In C	2.99	2.99	2.00	2.99	2.99	1.00	1.00		2.00	1.00		2.00	2.99	2.00
C203	EC8351-Electronic Circuits- I	1.90	1.90	1.64	1.90	1.90	1.27	0.89		0.63	0.76		1.27	1.90	1.27
C204	EC8352-Signals and Systems	1.91	1.91	1.79	1.91	1.91	1.28	0.77		0.64	0.64		1.28	1.91	1.28
C205	EC8392-Digital Electronics	1.91	1.91	1.66	1.91	1.91	0.89	1.02		0.64	0.77		1.28	1.91	1.28
C206	EC8391-Control System Engineering	1.91	1.91	1.78	1.91	1.91	1.27	0.64		1.27	0.76		1.27	1.91	0.64
C207	EC8381-Fundamentals of Data Structures in C Laboratory	2.97	2.97	1.98	2.97	2.97	0.99	0.99	1.98	2.97	2.97	0.99	1.98	2.97	1.98
C208	EC8361-Analog and Digital Circuits Laboratory	3.00	3.00	2.00	3.00	3.00	1.00	1.00	2.00	3.00	3.00	1.00	2.00	3.00	2.00
C209	HS8381-Interpersonal Skills/Listening &Speaking	1.98	1.98	1.98	2.97	2.97	0.99	0.99	1.98	2.97	2.97	0.99	1.98	2.97	1.98
C210	MA8451-Probability and Random Processes	2.97	2.97	1.98	2.97	2.97	0.99	0.99		1.98	0.99		1.98		
C211	EC8452-Electronic Circuits II	2.97	2.97	2.57	2.97	2.97	1.98	1.38		0.99	1.19		1.98	2.97	1.98
C212	EC8491-Communication Theory	2.99	2.99	2.20	2.99	2.99	2.00	1.20		1.00	1.20		2.00	2.99	2.00
C213	EC8451-Electromagnetic Fields	2.99	2.99	2.99	2.99	2.99	1.99	1.00		1.00	1.00		1.99	2.99	1.99
C214	EC8453-Linear Integrated Circuits	2.98	2.98	1.99	2.98	2.98	1.99	1.39		0.99	0.99		1.99	2.98	1.99
C215	GE8291-Environmental Science and Engineering	2.99	2.99	1.00	2.99	2.99	1.99	1.39	1.99	1.00	1.00		1.99	2.99	1.99
C216	EC8461-Circuits Design and Simulation Laboratory	3.00	3.00	2.00	3.00	3.00	2.00	1.00	2.00	3.00	3.00	1.00	2.00	3.00	2.00
C217	EC8462-Linear Integrated Circuits Laboratory	3.00	3.00	2.00	3.00	3.00	2.00	1.00	2.00	3.00	3.00	1.00	2.00	3.00	2.00
C301	EC8501-Digital Communication	2.95	2.95	2.36	2.95	2.95	1.97	0.98		0.98	0.98		1.97	2.95	2.95

Code	Course													
C302	EC8553-Discrete-Time Signal Processing	2.97	2.97	2.97	2.97	2.97	1.98	0.99		0.99	0.99		1.98	2.97	2.97
C303	EC8552-Computer Architecture and Organization	2.98	2.98	1.98	1.98	2.98	1.98	0.99		0.99	0.99		0.99	1.98	2.98
C304	EC8551-Communication Networks	2.97	2.97	2.18	1.98	2.97	1.98	0.99		0.99	0.99		0.99	1.98	2.97
C305	GE8077-Total Quality Management	2.98	1.98	0.99	0.99	1.98	2.58		2.98	2.98	2.98	2.98	2.98		2.98
C306	OCE551-Air Pollution and Control Engineering	2.98	1.99	0.99	0.99	1.99	2.98		2.98	2.98	2.98	2.98	2.98		0.99
C307	EC8562-Digital Signal Processing Laboratory	2.96	2.96	1.98	2.96	2.96	1.58		1.98	2.96	2.96	0.99	1.98	2.96	2.96
C308	EC8561-Communication Systems Laboratory	2.95	2.95	1.97	2.95	2.95	1.97		1.97	2.95	2.95	0.98	1.97	2.95	2.95
C309	EC8563-Communication Networks Laboratory	2.98	2.98	1.98	2.98	2.98	1.98		1.98	2.98	2.98	0.99	1.98	2.98	2.98
C310	EC8691-Microprocessors and Microcontrollers	2.97	2.97	2.97	2.97	2.97	1.98	0.99	0.99	0.99	0.99		1.98	2.97	2.97
C311	EC8095-VLSI Design	2.95	2.95	2.75	2.95	2.95	1.97	0.98	0.98	0.98	0.98		1.97	2.95	2.95
C312	EC8652-Wireless Communication	2.95	2.95	2.36	2.95	2.95	1.97	0.98		0.98	0.98		1.97	2.95	2.95
C313	MG8591-Principles of Management	2.95	1.96	0.98	0.98	1.96	1.96		2.95	2.95	2.95	2.95	2.95		2.95
C314	EC8651-Transmission Lines and RF Systems	2.96	2.96	2.96	2.96	2.96	1.58			0.99	0.99		1.98	2.96	2.96
C315	EC8002-Multimedia Compression and Communication	2.94	2.94	1.96	1.96	2.94	1.96			0.98	0.98		1.96	2.94	2.94
C316	EC8681-Microprocessors and Microcontrollers Laboratory	2.97	2.97	2.97	2.97	2.97	1.98	1.98	1.98	2.97	2.97	1.98	1.98	2.97	2.97
C317	EC8661-VLSI Design Laboratory	2.96	2.96	2.96	2.96	2.96	1.98	1.98	1.98	2.96	2.96	0.99	1.98	2.96	2.96
C318	EC8611-Technical Seminar	2.95	2.95	2.95	2.95	2.95	1.97	1.97	1.97	2.95	2.95	0.98	1.97	2.95	2.95
C319	HS8581-Professional Communication	2.96	2.96	2.96	2.96	2.96	1.97	1.97	0.99	0.99	0.99	0.99	1.97	2.96	2.96

Course	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C401	EC8701-Antennas and Microwave Engineering	2.96	2.96	2.96	2.96	2.96	0.99	0.99	0.99	0.99	0.99		1.97	2.96	2.96
C402	EC8751-Optical Communication	2.97	2.97	2.97	2.97	2.97	1.98	0.99	0.99	0.99	0.99		1.98	2.97	2.97
C403	EC8791-Embedded and Real Time Systems	2.98	2.98	2.98	2.98	2.98	1.99	1.99	0.99	0.99	0.99		1.99	2.98	2.98
C404	EC8702-Ad hoc and Wireless Sensor Networks	2.96	2.96	2.17	1.97	2.96	1.97			0.99	0.99		0.99	2.96	2.96
C405	CS8082-Machine Learning Techniques	2.96	2.96	2.96	1.97	1.97	1.97		0.99	0.99	0.99	0.99	1.97	1.97	1.97
C406	OCY751-Waste Water Treatment	2.85	2.85	2.85	1.90	1.90	2.85	1.90	0.95	0.95	0.95	0.99	1.90	1.90	1.90
C407	EC8711-Embedded Laboratory	2.98	2.98	2.98	2.98	2.98	2.98	1.99	1.99	2.98	2.98	1.99	1.99	2.98	2.98
C408	EC8761-Advanced Communication Laboratory	2.97	2.97	2.97	2.97	2.97	2.97	1.98	1.98	2.97	2.97	1.98	1.98	2.97	2.97
C409	GE8076-Professional Ethics in Engineering	2.85	2.85	1.90	1.90	2.85	2.85		2.85	1.90	1.90		1.90	2.85	2.85
C410	EC8094-Satellite Communication	2.74	2.74	1.83	2.74	2.74	2.74	0.91	0.91	0.91	1.46		1.83	2.74	2.74
	Average	**2.73**	**2.61**	**2.08**	**2.44**	**2.57**	**1.66**	**1.13**	**1.80**	**1.68**	**1.67**	**1.43**	**1.77**	**2.66**	**2.21**
C411	EC8811-Project Work	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Attainment Method	**Attainment Tool**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
Direct Method	Theory & Practical Courses (60%)	1.64	1.56	1.25	1.46	1.54	1.00	0.68	1.08	1.01	1.00	0.86	1.06	1.59	1.33
Direct Method	Project work (20%)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Overall PO Direct Attainment		**2.24**	**2.16**	**1.85**	**2.06**	**2.14**	**1.60**	**1.28**	**1.68**	**1.61**	**1.60**	**1.46**	**1.66**	**2.19**	**1.93**
Indirect Method	Co-curricular and Extra-curricular activities (5%)	0.10	0.10	0.08	0.10	0.10	0.07	0.07	0.07	0.08	0.08	0.05	0.08	0.10	0.08
Indirect Method	Program End Feedback (5%)	0.15	0.11	0.15	0.11	0.15	0.11	0.15	0.15	0.11	0.15	0.15	0.15	0.15	0.15
Indirect Method	Alumni Feedback (5%)	0.15	0.15	0.15	0.14	0.15	0.14	0.15	0.15	0.12	0.15	0.15	0.15	0.15	0.15

Indirect Method	Employer Feedback (5%)	0.15	0.15	0.15	0.15	0.15	0.12	0.12	0.15	0.12	0.15	0.15	0.15	0.15	0.15
Overall PO Indirect Attainment		**0.55**	**0.51**	**0.53**	**0.50**	**0.55**	**0.43**	**0.48**	**0.52**	**0.43**	**0.53**	**0.50**	**0.53**	**0.55**	**0.53**
Overall PO Attainment		2.79	2.67	2.37	2.56	2.69	2.02	1.76	2.20	2.04	2.13	1.96	2.19	2.74	2.45
Target % = <PO1-PO5+ PSO1+ PSO2 = 70% (or) 2.1 and PO6-PO12 = 60% (or) 1.8 Attained / Not Attained		Attained	Attained	Attained	Attained	Attained	Attained	Not Attained	Attained	Attained	Attained	Attained	Attained	Attained	Attained

Total PO Attainment (2018-22 Batch)