

CO-PO Attainment of Computer Engineering AY 2023-24

1. Course Outcomes (COs) and Program Outcomes (POs)

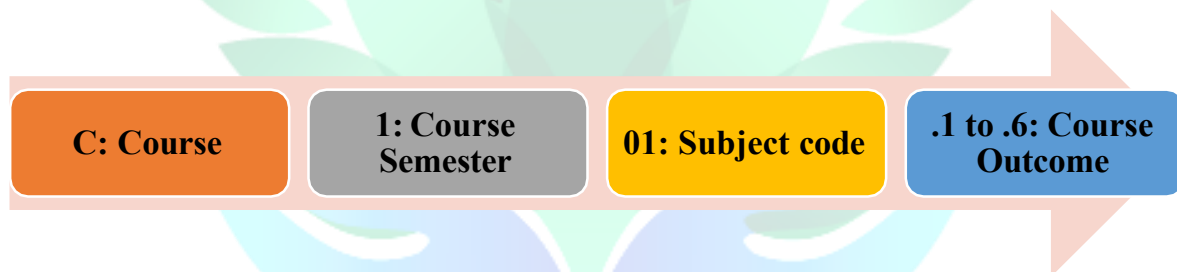
1.1. Establish the correlation between the courses and the Program Outcomes & Program

1.1.1 Course Outcomes (COs) (05)

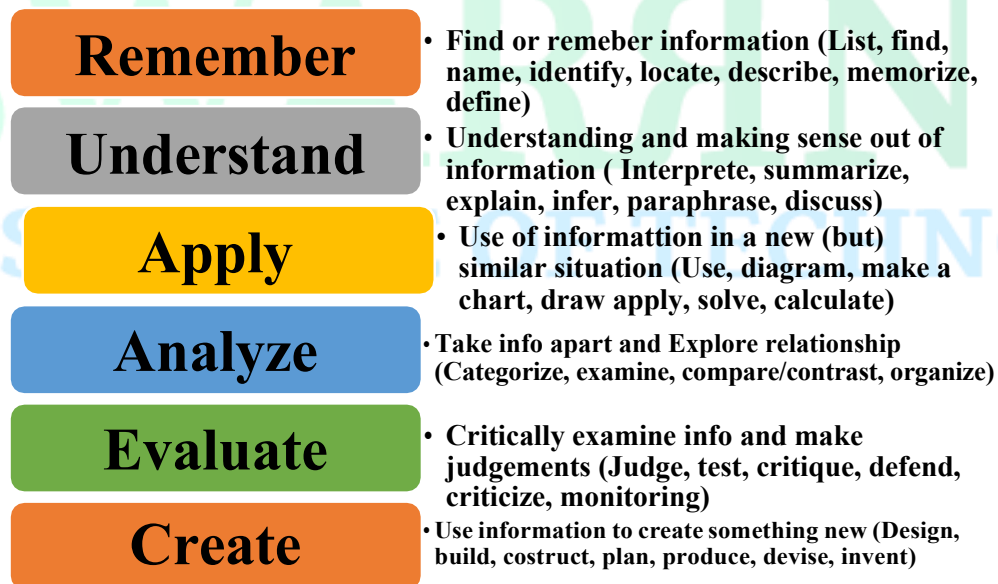
Course outcomes (COs) are the statements indicating what a student can do after the successful completion of a course. Every Course leads to some Course Outcomes. The CO statements are defined by considering the course content covered in each module of a course. For every course there may be 4 to 6 COs. The keywords used to define COs are based on Bloom's Taxonomy. The Course Outcomes are defined in accordance with the University curriculum.

Course coding system:

Example: 23000001.....23000004.....23040302....



Bloom's Taxonomy:



CO-PO matrices Methodology

- Students need to develop certain qualities to effectively contribute to industry, academia, and society. These qualities are defined as Program Outcomes (POs), and the curriculum is structured to foster them.
- Based on how well the course content supports achieving each PO (e.g., PO1, PO2, PO3, etc.), courses are rated as substantial (3), moderate (2), or slight (1) in their contribution.
- Faculty members align Course Outcomes (COs) with POs, considering the broader goals and relevance of the course. This mapping is finalized through discussions in departmental committee meetings and institution-wide faculty meetings, resulting in the CO-PO Matrix.
- The correlation between COs and POs are established through the process given below:

Step 1: COs defined by the faculty or given by council are mapped with the Program outcomes.

Step 2: For each course, the average value of POs is obtained.

Step 3: Step 2 is carried out for all the courses in the program.

Course co-ordinator: Prepare proper CO's and finalize CO-PO mapping

Criteria 3 member: Set CO attainment target level

Criteria 3 member: Consolidated CO attainment of respective year

Criteria 3 member: Consolidated PO attainment through direct assessment and indirect assessment

Criteria 3 member: Drawn conclusion/ observation and suggested for any action to be taken for fulfillment of CO and PO attainment

Figure 1: Process involved in CO-PO mapping and attainment

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Target level set for CO attainment from results

Target Set (Attainment Level)	Percentage result
Level 1	≤ 60
Level 2	61 - 65
Level 3	≥ 66

Course-PO matrix of courses for all years of study

The mapping of all the courses with PO's is summarized and presented in following table 1.

Note: Correlation levels 1, 2 or 3, as defined below:

1: Slight (Low)

2: Moderate (Medium)

3: Substantial (High)

'-' Indicates there is no correlation,

Table 1: Correlation of CO with POs (All courses)

SUBJECT	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	OVER ALL CO AVG
23000001	3.0	2.8	2.0	2.0	2.0	-	-	-	-	-	-	2.0	2.3
23000004	3.0	2.6	2.8	2.2	2.8	1.0	-	1.0	2.5	2.2	2.2	3.0	2.3
23000012	2.5	2.7	2.2	2.0	2.2	2.3	2.0	1.7	1.0	1.3	1.3	1.5	1.9
23000003	2.8	1.8	2.8	3.0	3.0	1.2	1.3	1.0	-	-	-	1.8	1.8
12300001	2.0	2.5	2.0	2.5	-	-	-	-	-	-	-	2.5	2.3
23000006	2.4	2.2	1.8	2.4	1.3	3.0	3.0	2.4	2.0	2.4	1.7	3.0	2.3
23000002	2.3	2.0	2.3	1.8	2.8	1.8	1.5	0.8	1.5	1.3	1.3	2.0	1.8
23000005	3.0	2.4	1.8	2.0	2.4	-	2.0	-	-	-	-	2.0	2.2
23000008	-	-	-	-	-	2.0	-	2.5	2.3	2.7	-	2.0	2.3
23000009	3.0	2.5	2.5	1.8	2.3	1.8	-	-	3.0	1.0	-	2.0	2.2
23000010	3.0	2.0	1.0	2.0	2.3	-	-	-	-	-	-	2.0	2.2
23000011	2.2	2.5	2.8	2.0	3.0	2.0	0.0	1.5	2.0	2.6	2.0	1.7	2.3
12300002	2.7	2.3	2.1	1.9	-	-	-	-	-	-	-	1.9	2.0
23000015	3.00	2.60	1.00	2.40	1.20	-	2.00	-	-	1.00	-	2.40	1.95
23040302	3	2.4	2.4	1.6	2.8	-	-	-	1.0	1.2	1.0	3.0	2.04
23040301	3	2.6	2.8	1.8	3.0	-	-	-	-	1.4	-	3.0	2.51
23070301	2.4	3.0	2.7	2.3	1.8	3.0	-	2.0	3.0	1.2	3.0	3.0	2.49
23040303	3	2.8	2.4	2.0	3.0	-	-	-	-	1.0	-	3.0	2.5
12300003	2	2.4	2.2	2.4	2.2	-	-	-	-	-	-	-	2.2
23000018	3	2.8	-	2.4	2.4	-	-	-	-	-	-	2.0	2.5

1.2. Attainment of Course Outcomes

1.2.1 Describe the assessment components and processes used to gather the data upon which the evaluation of Course Outcome is based

The various assessment components and processes used to gather the data for the evaluation of Course Outcome are described as follows. The maximum marks and the weightage of each assessment component in the final grade are also summarized in the Table 2.

Below table shows the list of assessment processes:

Table 2: List of assessment processes

Academic Year	Semesters	Particulars	Marks
2023-24	Odd Semester	Internal Examination (Assignment + Class Attendance + Internal Assessment)	30 (05+05+20)
		University Examination	70
	Even Semester	Internal Examination (Assignment + Class Attendance + Internal Assessment)	30 (05+05+20)
		University Examination	70

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Table 3: Assessment components and processes used for the evaluation of Course

Outcome

Assessment components	Marks	Weightage	Quality/Relevance of assessment process
Internal assessment (IA)	30	30%	<ul style="list-style-type: none"> ➤ The overall evaluation of students' performance consists of two main components: <p>Internal Assessment: 30% of the total marks.</p> <p>University Examination: 70% of the total marks.</p> <p>This split ensures both continuous assessment and final examination performance are fairly considered.</p> <ul style="list-style-type: none"> ➤ Internal Assessment (30%) is designed to evaluate students continuously throughout the semester, promoting regular study habits and engagement. It is further divided into three components: ➤ Internal Examination (15 marks): Conducted periodically during the semester. Tests students' understanding of the syllabus covered up to that point. May include written tests, quizzes, or mid-semester exams. ➤ Class Attendance (5 marks): Encourages regular participation in classes. Marks are awarded based on the percentage of classes attended. Promotes discipline and consistent learning. ➤ Assignment (10 marks): Based on submission of assignments given by the faculty. May involve problem-solving tasks, essays, projects, or practical exercises. Aims to develop research, analytical, and writing skills. ➤ This internal assessment structure ensures that students are evaluated not only on their final exam performance but also on their regular participation, attendance, and engagement with the course material.
University assessment (End semester Examination)	70	70%	

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Criteria for Pass: As per the general passing criteria, students must secure a minimum of 40% marks separately in both Internal Assessment and University Examination for each course. This rule applies individually to all theory and practical courses, which are treated as separate subjects. Internal assessment includes components like tests, assignments, and attendance, while the university exam is conducted at the end of the semester. Passing one component does not compensate for failing the other. Students must meet the minimum in both to be considered as having passed the subject. This ensures consistent performance throughout the course in both internal and external evaluations.

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

Following Procedure is followed for the assessment of attainment of COs through Internal Assessment marks and end semester marks:

Setting of attainment levels:

Step 1: Course Outcome attainment levels: The CO attainment levels are set for each course in the final examination as target. Accordingly, the target levels for CO attainment are set.

Step 2: Criteria for setting and improvement of the target levels: For every course the target level for an assessment year is set on the basis of the target achieved in the previous year. For any course, achieving the maximum attainment level of 3 during the assessment year, the attainment level for the subsequent year shall be redefined by increasing the target marks. Table presents the target levels for CO attainment.

Step 3: Weightage and CO attainment achieved: As per the University curriculum, the total marks for the theory courses is 100, Accordingly the weightage adopted for the program are:

- 70% weightage for University examination and
- 30% weightage for internal assessment.

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Target level for academic year 2023-24 is shown below:

Academic year	For internal assessment		For University examination	
	Target Level	Internal Marks	Target Level	External Marks
2023-24	1	≤10	1	32
	2	11 to 12	0	-
	3	≥13		

The Course outcomes attained through university examinations and Internal Assessment are calculated and same is presented in Table 4

Table 4: Target Marks and levels (2023-24)

Course Code	Marks		Level		30% Internal	70% External	Target
	IA	Final	T_IA	T_Final			
I SEM							
23000001	12	28	1	1	0.3	0.7	1
23000004	12	28	1	1	0.3	0.7	1
23000012	12	28	1	1	0.3	0.7	1
23000003	12	28	1	1	0.3	0.7	1
12300001	25	25	1	1	0.3	0.7	1
II SEM							
23000005	12	28	1	1	0.3	0.7	1
23000008	12	28	1	1	0.3	0.7	1
23000009	12	28	1	1	0.3	0.7	1
23000010	12	28	1	1	0.3	0.7	1
23000011	12	28	1	1	0.3	0.7	1
12300002	25	25	1	1	0.3	0.7	1
III SEM							
23000015	12	28	1	1	0.3	0.7	1
23040302	12	28	1	1	0.3	0.7	1
23040301	12	28	1	1	0.3	0.7	1
23040303	12	28	1	1	0.3	0.7	1
12300003	25	25	1	1	0.3	0.7	1

Attainment of Cos:

The attainment of COs is taken as the average of attainment of all the CO's for the course and expressed as CO-IA (30% weightage of CO attainment through IA tests). However, the institution is not accessible to the distribution of marks to corresponding COs from University results, with that as constraint CO-FE (CO attainment through semester examination) is computed as 70% of final examination. Together is expressed as the attainment of CO for the particular course.

Target Set:	Percentage
Level 1	≤ 60
Level 2	61 - 65
Level 3	≥ 66

The course level attainment for the academic year 2023-24 is presented in TABLE 5

Course Outcomes Attainment level and Course Attainment level for all the courses is compiled.

Table 5 : Course Outcome Attainment for 2023-24

		Target Set					
		Level 1	≤ 60				
		Level 2	61 - 65				
		Level 3	≥66				
Course Code	Exam	No. of Students appeared	No. of Students scoring more than 10/32 marks (in	% students scoring	Attainment level	Weighted Score	Course Outcome attainment
23000001	INT	48	48	100.00	3	0.9	3
	EXT	46	43	93.48	3	2.1	
23000004	INT	48	48	100.00	3	0.9	3
	EXT	46	37	80.43	3	2.1	
23000012	INT	48	48	100.00	3	0.9	3
	EXT	47	47	100.00	3	2.1	
23000003	INT	48	48	100.00	3	0.9	3
	EXT	47	41	87.23	3	2.1	
12300001	INT	48	48	100.00	3	1.5	3
	EXT	47	46	97.87	3	1.5	
23000006	INT	48	48	100.00	3	0.9	3
	EXT	47	42	89.36	3	2.1	

23000005	INT	47	47	100.00	3	0.9	3
	EXT	46	44	95.65	3	2.1	
23000008	INT	47	47	100.00	3	0.9	3
	EXT	46	45	97.83	3	2.1	
23000009	INT	47	47	100.00	3	0.9	3
	EXT	46	44	95.65	3	2.1	
23000010	INT	47	47	100.00	3	0.9	3
	EXT	46	44	95.65	3	2.1	
23000011	INT	47	47	100.00	3	0.9	3
	EXT	45	40	88.89	3	2.1	
12300002	INT	47	47	100.00	3	1.5	3
	EXT	46	44	95.65	3	1.5	
23000015	INT	44	44	100.00	3	0.9	3
	EXT	44	43	97.73	3	2.1	
23040302	INT	42	42	100.00	3	0.9	3
	EXT	44	44	100.00	3	2.1	
23040301	INT	43	43	100.00	3	0.9	3
	EXT	44	41	93.18	3	2.1	
23070301	INT	42	42	100.00	3	0.9	3
	EXT	44	42	95.45	3	2.1	
23040303	INT	42	42	100.00	3	0.9	3
	EXT	44	44	100.00	3	2.1	
12300003	INT	44	44	100.00	3	1.5	3
	EXT	42	37	88.10	3	1.5	

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Below table shows verification of CO attainment:

Table 6: Verification of CO attainment

2023-2024			
Course Code	Targent Level	Course Outcomes Attainment	Verification/ Remarks
23000001	1	3	-
23000004	1	3	-
23000012	1	3	-
23000003	1	3	-
12300001	1	3	-
23000006	1	3	-
23000002	1	3	-
23000005	1	3	-
23000008	1	3	-
23000009	1	3	-
23000010	1	3	-
23000011	1	3	-
12300002	1	3	-
23000015	1	3	-
23040302	1	3	-
23040301	1	3	-
23070301	1	3	-
23040303	1	3	-
12300003	1	3	-
23000018	1	3	-

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1.3. Attainment of Program Outcomes

1.3.1. Describe assessment tools and processes used for assessing the attainment of each PO

The tools, process and frequency of assessment adopted for evaluating the attainment of the POs are detailed in Table 7

Table 7: Scheme for Internal assessment and End semester examination as well as the feedback analysis

Assessment Method	Assessment tool	Aim	Assessment Frequency	Percentage Contribution	
Direct	Internal assessment	Assessing the understanding of the fundamental concepts and expression of the practical skills and knowledge gained	Twice a semester	30%	80%
	University examination		Once in a semester	70%	
Indirect	Exit survey	To assess the contribution of the Program in the overall development of the graduates	Once in a year after graduation	20%	100%
	Employer survey	To get the feedback from employers for the programme and overall performance of the students in the industrial working environment	Once in a year after placement/ after graduation		
	Alumni survey	To assess the effectiveness of program for the career development and placement of the graduates	Once in a year from alumni		

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Following Procedure is followed to assess the attainment of POs.

- For every course the target level for an assessment year is set on the basis of the target achieved in the previous year.
- For any course, achieving the maximum attainment level of 3 during the assessment year, the attainment level for the subsequent year shall be redefined by increasing the target marks.

1.3.2 Provide results of evaluation of each PO

Table 8 show the target levels for POs through courses for the academic year 2023-24

Table 9 show the indirect attainment levels for POs through courses for the academic year 2023-2024

Table 10 show the attainment levels for POs through courses for the academic year 2023-2024

Tables 8: Target Levels for POs

SUBJECT	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	OVERALL CO AVG
23000001	1.00	0.93	0.67	0.67	0.67	—	—	—	—	—	0.67	0.77	2.3
23000004	1.00	0.87	0.93	0.73	0.93	0.33	—	0.33	0.83	0.73	1.00	0.77	2.3
23000012	0.83	0.89	0.72	0.67	0.72	0.78	0.67	0.56	0.33	0.44	0.50	0.63	1.9
23000003	0.93	0.60	0.92	1.00	1.00	0.40	0.42	0.33	—	—	0.60	0.60	1.8
12300001	0.67	0.83	0.67	0.83	—	—	—	—	—	—	0.83	0.77	2.3
23000006	0.80	0.73	0.58	0.80	0.44	1.00	1.00	0.80	0.67	0.80	1.00	0.78	2.3
23000002	0.75	0.67	0.75	0.58	0.92	0.58	0.50	0.25	0.50	0.42	0.67	0.60	1.8
23000005	1.00	0.80	0.58	0.67	0.80	—	0.67	—	—	—	0.67	0.73	2.2
23000008	—	—	—	—	—	0.67	—	0.83	0.78	0.89	0.67	0.77	2.3
23000009	1.00	0.83	0.83	0.58	0.75	0.58	—	—	1.00	0.33	0.67	0.73	2.2
23000010	1.00	0.67	0.33	0.67	0.78	—	—	—	—	—	0.67	0.73	2.2
23000011	0.72	0.83	0.94	0.67	1.00	0.67	0.00	0.50	0.67	0.87	0.56	0.77	2.3
12300002	0.91	0.78	0.70	0.64	—	—	—	—	—	—	0.64	0.67	2.0
23000015	3.00	2.60	1.00	2.40	1.20	—	2.00	—	—	1.00	—	2.40	1.95
23040302	3.00	2.40	2.40	1.60	2.80	—	—	—	1.00	1.20	1.00	3.00	2.04
23040301	3.00	2.60	2.80	1.80	3.00	—	—	—	—	1.40	—	3.00	2.51
23070301	2.40	3.00	2.67	2.33	1.80	3.00	—	2.00	3.00	1.20	3.00	3.00	2.49
23040303	3.00	2.80	2.40	2.00	3.00	—	—	—	—	1.00	—	3.00	2.5
12300003	2.00	2.40	2.20	2.40	2.20	—	—	—	—	—	—	—	2.2
AVERAGE ATTAINMENT													
TOTAL COUNT													
AVERAGE ATTAINMENT													

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Tables 9: Indirect Attainment level of POs

Form name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Alumni Survey												
Student exit survey												
Employer survey												
Total												
Average												
20% of indirect assessment												

Tables 10: Attainment level of POs

SUBJECT	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
23000001												
23000004												
23000012												
23000003												
12300001												
23000006												
23000002												
23000005												
23000008												
23000009												
23000010												
23000011												
12300002												
23000015												
23040302												
23040301												
23070301												
23040303												
12300003												
SUM OF PO												
COUNT OF PO												
DIRECT TARGET (AVG)												
ATTAINMENT OF PO DIRECT												
80% OF DIRECT ATT												
20% OF INDIRECT ATTAINMENT												
TOTAL												

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