



CO-PO Attainment Process

The major components of Outcome Based Education (OBE) are Course Outcome (CO) and Program Outcome (PO). Based on how well these two parts are defined and evaluated, OBE attainment is measured.

Course Outcomes (COs) are statements that specify what a learner will know or be able to do as a result of a learning activity. Outcomes are usually expressed as knowledge, skills, or attitudes. It is a measurable, observable, and specific statement that clearly indicates what a student should know and be able to do as a result of learning. It describes what students are able to demonstrate in terms of knowledge, skills and values upon completion of a course/a span of several courses.

Program Outcomes (POs) describe what a program is expected to accomplish. POs describe what students should know and be able to do at the end of the programme.

Program Specific Outcomes (PSOs) describe what the Postgraduates/graduates of a specific program should be able to do. Clear articulation of course outcomes, POs, and PSOs serves as the foundation for evaluating the effectiveness of the teaching and learning process.

The course correlation matrix shows the learning relationship (Level of Learning Achieved) between Course Outcomes and Program Outcomes of a course. This matrix strongly indicates whether the students are able to achieve the course objectives/outcomes. The matrix can be used for any course and is a good way to evaluate a course syllabus/content/structure.

Assessment Process for CO Attainment:

For the evaluation and assessment of CO's and PO's, rubrics are used. The rubrics considered here are given below:

CO Assessment Rubrics:

Direct assessment: refers to evaluation through internal assessments which include Assessment, Mid Term Examinations and End Term Examination.

Sample calculation- CO Mapping

Components for Internal Assessment	Assessment					Mid Term			End Term				
	(Assignment/ Text/ Presentation/ Viva/ Quiz etc.)					Q 1(a)	Q 1(b)	Q 2	Q 1	Q 2	Q 3	Q 4	Q 5
	Comp. 1	Comp. 2	Comp. 3	Comp. 4	Comp. 5								
Course Outcome	CO1	CO2	CO4	CO3	CO4	CO1	CO1	CO 2	CO 1	CO 2	CO 3	CO 4	CO 5
Max Marks	2	3	5	5	5	5	5	10	10	10	10	10	10
1 2201730062	2	0	3	1	2		4	7	5	6	1	6	9
2 2201730063	1	2	3	1	5	3	4	2	3	5	5	2	3
3 2201730065	2	2	4	2	2	4	5	6	3	8	4	4	6
4 2201730066	1	0	4	1	5	4	4	2	9	5	5	5	6
5 2201730068	1	0	1	0	2	1	2	2	3	2	4	3	4



CO PO Attainment																				
Course Outcome	CO1				CO2				CO3				CO4				CO5			
Student Id	Max Marks	Obtained Marks	Percentage	CO Attained	Max Marks	Obtained Marks	Percentage	CO Attained	Max Marks	Obtained Marks	Percentage	CO Attained	Max Marks	Obtained Marks	Percentage	CO Attained	Max Marks	Obtained Marks	Percentage	CO Attained
2201730062	22	11	50%	Yes	23	13	57%	Yes	15	4	27%	No	20	9	45%	Yes	10	9	90%	Yes
2201730063	22	11	50%	Yes	23	9	39%	No	15	7	47%	Yes	20	8	40%	Yes	10	3	30%	No
2201730065	22	14	64%	Yes	23	16	69%	Yes	15	7	47%	Yes	20	8	40%	Yes	10	6	60%	Yes
2201730066	22	18	82%	Yes	23	7	30%	No	15	10	67%	Yes	20	11	55%	Yes	10	6	60%	Yes
2201730068	22	7	32%	No	23	4	17%	No	15	5	33%	No	20	5	25%	No	10	4	40%	Yes

No. of students attempted	CO1	5	CO2	5	CO3	5	CO4	5	CO5	5
No. of students scoring \geq threshold (40%)		4		2		3		4		4
% of students crossing threshold		80.00%		40.00%		60.00%		80.00%		80.00%

COs Attainment Level: Course outcomes of all courses are assessed with the help of attainment levels are evaluated based on set attainment rubrics as per the table.

Assessment Methods	Attainment Levels	
Assessment + Mid Term + End Term Exam	Level 1	60% of students scoring more than 40% marks.
	Level 2	60.01-80% of students scoring more than 40% marks.
	Level 3	80.01% of students scoring more than 40% marks.

Course Outcome	CO Attainment %	CO Attainment Level
CO1	80.00%	3
CO2	40.00%	1
CO3	60.00%	2
CO4	80.00%	3
CO5	80.00%	3



CO PO Correlation Matrix

CO PO Mapping															
Course Outcome	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	1			2						1		3	1	1
CO2	3	1	1		1								2	2	
CO3	2				3			1	1				1	3	1
CO4		1		1	1		1			1			3	2	
CO5	3	3	2	3	2	1						3	3	2	

CO – PO AND CO – PSO MAPPING OF COURSES:

All the courses together must cover all the POs (and PSOs). For a course we map the COs to POs through the CO-PO matrix and to PSOs through the CO-PSO matrix as shown below.

The various correlation levels are:

- “1” – slightly (Low) Correlation
- “2” – moderately (Medium) Correlation
- “3” – substantially (High) Correlation
- “-” indicates there is no correlation between CO and PO.

Calculating PO Attainment:

The PO attainment is calculated by using the predefined CO/PO matrix and the value of Final CO attainment for the subject. Course level PO & PSO Attainment Calculation: The PO & PSO attainment for the course is calculated using the formula.

$$\text{CO attainment Ratio of Course (x)} = \frac{\text{Co attainment} * \text{Corelation matrix}}{3(\text{Maximum attainment value})}$$

PO Attainment Matrix

CO PO Attainment															
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3.00	1.00			2.00						1.00		3.00	1.00	1.00
CO2	1.00	0.33	0.33		0.33								0.67	0.67	
CO3	1.33				2.00			0.67	0.67				0.67	2.00	0.67
CO4		1.00		1.00	1.00		1.00			1.00			3.00	2.00	
CO5	3.00	3.00	2.00	3.00	2.00	1.00						3.00	3.00	2.00	
Average	2.08	1.33	1.17	2.00	1.47	1.00	1.00	0.67	0.67	1.00	1.00	3.00	2.07	1.53	0.83



Indirect assessment: refers to the exit feedback survey taken by students/faculty/employers. The exit survey may be based on a marking scheme (1-3) for each CO. The course exit survey samples are given below for student/faculty/employer (Kindly note the respective course teacher may modify these templates according to the requirements of the course).

Sample1: Course Outcome exit survey for students

Course Outcome		1(Low)	2(Moderate)	3(High)
CO1	Understand the role and applications of data structure in real life			
CO2	Develop abstract data types for solving the complex problems			
CO3	Understand the concepts of non-linear data structures and applications			
CO4	Analyze the efficiency of algorithms			

Sample 2: Course Contents exit survey for students

Questions	1(Low)	2(Moderate)	3(High)
Quality of the Course Content			
Relevance of the textbook to this course			
Were the lectures clear/well organized and presented at a reasonable pace?			
Did the lectures stimulate you intellectually?			
Are the assignment/lab experiment procedures clearly explained?			

Sample3: Faculty/Employer Survey

Questions	1(Low)	2(Moderate)	3(High)
Satisfaction with the caliber of the graduates			
Courses are relevant to the organization's vision and mission			
Satisfaction with the speed at which course content is being adapted to meet changing industrial needs			
Relevant subject or discipline knowledge			
Quality of employability skills and attributes			
The satisfaction that graduates are learning the right skills			