

Procedure of Calculating CO PO Attainment

Step 1: Formation of Domain Group / Mapping, Validation and Formation of Rubrics of CO PO as per syllabus content / Creation of Articulation Matrix / Specific remarks for CO PO attainment level

MATRIX FOR CO PO MAPPING FOR COURSE:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	X	X	X	X	--	--	--	--	--	--	--	X		
CO2	X	X	X	X	X	--	--	--	--	--	X	X		
CO3	X	X	X	X	X	X	X	X	--	--	X	X		
CO4	X	X	X	X	X	--	X	--	--	--	X	X		
CO5	X	X	X	X	--	--	--	--	--	--	X	X		
CO6	X	X	X	X	X	X	X	X	--	--	X	X		

ARTICULATION MATRIX FOR SUBJECT / COURSE (Assigning weightages as per curriculum)

High – 3

Moderate – 2

Low – 1

ATTAINMENT OF PO THROUGH COURSE OUTCOMES

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	2	--	--	--	--	--	--		2		
CO2	2	2	2	3	1	--	--	--	--	--	2	2		
CO3	2	3	3	3	2	2	1	2	--	--	2	2		
CO4	2	2	1	2	2	--	1	--	--	--	1	1		
CO5	1	1	1	1	--	--	--	--	--	--	2	2		
CO6	2	3	3	3	3	2	2	1	--	--	2	2		
AVG	2	2.17	1.83	2.33	2.00	2.00	1.33	1.50	-	-	1.80	1.83		

- Calculate the Average Value of PO through Course Outcomes

$$\text{Average Value PO} = \frac{\text{Total of attainment level}}{\text{Total No. of COs mapped with PO}}$$

PROGRAM OUTCOME ARTICULATION MATRIX

(After entering the Average values of Course Outcomes of all subjects of a Program)

Year	Sem.	Subject Code	Name of 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	PS O1	PS O2
FE	I	FEC101															
	II	FEC201															
SE	III	MEC301															
	IV	MEC401															
TE	V	MEC501															
		MEC502	Thermal Engineering	2	2.17	1.83	2.33	2.00	2.00	1.33	1.50	-	-	1.80	1.83		
	VI	MEC601															
BE	VII	MEC701															
	VIII	MEC801															
Target Value																	

Calculate Average Value of PO of all subjects

$$\text{Average Value PO} = \frac{\text{Total of attainment level}}{\text{Total No. of subjects mapped with PO}}$$

Step 2: CALCULATION FOR DIRECT ATTAINMENT FOR CO PO MAPPING

1. Direct Tools:

- Internal Assessment I & II
- Assignments
- Tutorials
- Experiments
- Subject / Course Project
- Industrial Visits
- Presentation
- Final University Examination (Subject / Oral /Practical)

CALCULATION OF COURSE OUTCOME ATTAINMENT LEVEL

Estimating the Levels wrt students marks	
Cut-off %	Level
No. of students having marks $\geq 60\%$	3
No. of students having marks 50% to 59%	2
No. of students having marks 40% to 49%	1

Note: High Scoring subjects can elevate the attainment level with justification (If the results are observed consistently high, No failures or Number of failures are less, any other) for e.g. PCE I and PCE II

Enter the data of each student:

Name of students	IA 1		IA2		ASSIGNMENT		EXPERIMENT		COURSE PROJECT / IV / PRESENTATION	UNIVERSITY EXAM
	Q1	Q2	Q1	Q2	A1	A2	E1	E2		
Max Marks										
Student 1										
Student 2										
Student 3										
.										
.										
Student 100										
Total No. of students appeared										
Total No. of students scored above 60										
Total No. of students scored ≥ 50 and < 59										
Total No. of students scored ≥ 40 and < 49										
Mapping CO										All COs
Attainment Level										

Calculation of Attainment Level

Ex.

If Total no of students are 100

Total No. of students scored above 60 = 50

Total No. of students scored above 50 and < 59 = 25

Total No. of students scored above 40 and < 49 = 25

Then Attainment Level = $(50 \times 3 + 25 \times 2 + 25 \times 1) / 100 = 2.25$

External Assessment 80% and Internal Assessment 20% Calculation

Course Outcome	Internal Assessment (20%)				External Assessment (80%)	80% of External+20% of internal examination
	IA-I OR IA-II	Experiment	Assignment	Internal Evaluation Average	University Evaluation	
CO1	2.87	2.87	2.66	2.8	1.7	1.92
CO2	2.92	2.81	2.66	2.8	1.7	1.92
CO3	2.66		2.66	2.66	1.7	1.89
CO4	2.82		2.66	2.74	1.7	1.91
CO5			2.66	2.66	1.7	1.89
CO6			2.66	2.66	1.7	1.89

Articulation Matrix: (Converting Levels to Scores)

- Level 3 = Actual score
- Level 2 = Actual Score x 2 / 3
- Level 1 = Actual Score x 1 / 3

Actual Score	CO PO Attainment as per weightage		
	3	2	1
1.89	1.89	1.26	0.42
1.87	1.87	1.24	0.41
1.79	1.79	1.20	0.40
1.79	1.79	1.19	0.40
1.92	1.92	1.28	0.43
1.93	1.93	1.29	0.43

DIRECT ATTAINMENT OF COURSE OUTCOMES WITH PO (Articulation Matrix gets converted to Score Based Matrix)

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1.89	1.26	0.42	1.26	--	--	--	--	--	--		1.26		
CO2	1.24	1.24	1.24	1.87	0.41	--	--	--	--	--	1.24	1.24		
CO3	1.2	1.79	1.79	1.79	1.2	1.2	0.4	1.2	--	--	1.2	1.2		
CO4	1.19	1.19	0.4	1.19	1.19	--	0.4	--	--	--	0.4	0.4		
CO5	0.4	0.43	0.43	0.43	--	--	--	--	--	--	1.28	1.28		
CO6	1.28	1.93	1.93	1.93	1.93	1.29	1.29	0.43	--	--	1.29	1.29		
AVG	1.2	1.31	1.04	1.41	1.18	1.25	0.70	0.82	-	-	1.08	1.11		

DIRECT ATTAINMENT OF PROGRAM OUTCOMES (Considering all Subjects)

Year	Sem.	Name of Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	P09	P10	P11	P12	PSO1	PSO2
FE	I	FEC101														
		FEC102														
	II	FEC201														
		FEC202														
SE	III	MEC301														
		MEC302														
	IV	MEC401														
		MEC402														
TE	V	MEC501														
		MEC502	1.2	1.31	1.04	1.41	1.18	1.25	0.70	0.82	-	-	1.08	1.11		
	VI	MEC601														
		MEC602														
BE	VII	MEC701														
		MEC702														
	VIII	MEC801														
		MEC802														
Average																
Direct 80 %																

For Calculation of Direct attainment level of PO = $\frac{\text{Total of attainment Level}}{\text{No of courses for that particular PO}}$

2. INDIRECT ATTAINMENT TOOLS:

- Program Exit Survey
- Employer Feedback: Rubrics is given in department
- Alumni Feedback: Rubrics is available in Academic Diary
- Parents Feedback: Rubrics is available in Academic Diary
- Feedback from Industry

Rubrics of Indirect Attainment for all types of Feedback and Survey

Name of Alumni	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO1	PSO2
Student 1	1		1		1		1			1		1		
Student 2	2	1	2		2		2			2		2		
Student 3	2	1	2		1		2			2		2		
Student 4	2	2	1				1			1		1		
Student 5	3						2			2		2		
Student 6	2		2							2		2		
Student 7														
Student 8	2	1	2		1		2			2		2		
Student 9	2	2	1				1			1		1		
Student 10	3						2			2		2		
Student 11	2		2							2		2		
Student 12	2	1	2		1		2			2		2		
Student 13	2	2	1				1			1		1		
Student 14	3						2			2		2		
Student 15	2		2							2		2		
Student 16	2	1	2		1		2			2		2		
Student 17	2	2	1				1			1		1		
Student 18	3						2			2		2		
Student 19	2		2							2		2		
Student 20	2	2	1				1			1		1		
Average	2.2	1.5	1.6	0.0	1.2	0.0	1.6	0.0	0.0	1.7	0.0	1.7		

