

Shetkari Shikshan Prasarak Mandal's
KRISHNA MAHAVIDYALAYA, RETHARE BK

DEPARTMENT OF PHYSICS

PHYSICS OBE PROCESS

Academic Year 2021-2022

1. Course- Program outcome Matrix: The Program Outcomes are developed through the curriculum (curricular/co-curricular extra-curricular activities). The program outcomes are attained through course implementation. As an educator, one must know, **“to which POs is his/her course contributing?”**. So that one can design the learning experiences, select teaching methods, and design the tool for assessment. Hence, establishing the Course-PO matrix is an essential step in the OBE. The course-program outcomes matrix indicates the correlation between the courses and program outcomes. The CO-PO matrix is the map of the list of **courses contributing to the development of respective Pos**.

The Template is provided in the table below

Sr. No	Course Title	PSO -A	PSO -B	PSO -C	PSO -D	PSO -E	PSO -F	PSO -G	PSO -H
1.	DSE-E1 Mathematical Physics	√	√	√				√	√
2.	DSE-E2 Quantum Mechanics	√	√	√	√	√		√	√
3.	DSE-E3 Classical Mechanics and Classical Electrodynamics	√		√	√	√		√	√
4.	DSE-E4 Digital and Analog Circuits and Instrumentation	√	√	√			√	√	√
5.	DSE-F1 Nuclear and Particle Physics	√		√		√	√	√	√
6.	DSE-F2 Solid State Physics	√	√	√		√	√	√	√
7.	DSE-F3 Atomic and Molecular Physics and Astrophysics	√	√	√	√	√	√	√	√
8.	DSE-F4 Energy Studies and Materials Science	√	√	√	√	√	√	√	√
9.	Physics Practical	√	√	√	√	√	√	√	√

2. Course Outcomes (for all courses):

The course outcomes are the statement that describes the knowledge & abilities developed in the student by the end of the course (subject) teaching. The focus is on the development of abilities rather than mere content. There can be 5 to 7-course outcomes of any course. These are to be written in specific terms and not in general. The list of Course Outcomes is **Annexure-C** attached herewith.

3. Set Target levels for Attainment of Course Outcomes:

The course outcome attainment is assessed in order to track the graduates' performance w.r.t target level of performance. CO-PO attainment is the tool used for continuous improvement in the graduates' abilities through appropriate learning & teaching strategies. In order to assess student's performance with respect to abilities (at the end of course teaching/by the end of the program) the course outcome attainment is measured/calculated. In order to calculate the program outcome attainment, the course outcome attainment is calculated. Prior to that, the course-program outcome mapping is done.

4. Set Target level for Attainment of Program Outcomes:

The program outcome attainment is assessed in order to track the graduates' performance w.r.t target level of performance. CO-PO attainment is the tool used for continuous improvement in the graduates' abilities through appropriate learning & teaching strategies. In order to assess student's performance with respect to abilities (at the end of course teaching/by the end of the program) the course outcome attainment and program outcome attainment are measured/calculated. The program outcome attainment is governed by curricular, co-curricular, and extra-curricular activities including the stakeholders' participation. The direct method and indirect method are adopted to calculate the PO attainment. **The direct method implies the attainment by course outcomes contributing to respective program outcomes. An indirect method is the satisfaction/feedback survey of stakeholders.** In order to calculate the program outcome attainment, the course outcome attainment is calculated. Prior to that, the course-program outcome mapping is done. The set target level is the set benchmark to ensure continuous improvements in the learners'/ graduates' performance.

5. Course Attainment Levels:

- a) CO attainment is defined/set at three levels;
- b) The CO attainment is based on end-term examination assessment and internal assessment;
- c) The Co attainment is defined at three levels in ascending order
 - i. e.g. For end-term and internal examination;

Sr. No	Level	CO Attainments
1.	Level-1:	30% of students scored more than the class average
2.	Level-2:	40% of students score more than the class average
3.	Level-3	50% of students score more than the class average

The target level is set (e.g. Level-2). It indicates that **the current target is level-2; 40% of students score more than the class average**. The CO attainment is measured and the results are obtained. Based on the results of attainment, corrective measures/remedial action is taken.

e. CO Attainment= 80% (Attainment level in end-term examination) + 20% (Attainment level in internal examination)

6. Program attainment Level:

a. PO attainment is defined at five levels in ascending order;

The PO attainment is based on the average attainment level of corresponding courses (Direct Method) and feedback survey (Indirect method);

c. The PO attainment levels are defined/set as stated below;

Sr. No	Level	PO Attainments
1.	Level-1:	Poor: Greater than 0.5 and less than 1.0 (0.5>1
2.	Level-2:	Average: 1.0 to 1.5
3.	Level-3	Good: 3: 1.5 to 2.0
4.	Level-4	Very Good: 2.0 to 2.5
5.	Level-5	Excellent: 2.5 to 3.0

d. The PO attainment target level is set/defined (say, Level-4). It implies that the department is aiming at a minimum level-4 (very good) in the performance of abilities by the graduates. Based upon the results of attainment, the remedial measures are taken;

e. PO Attainment= 80% (Average attainment level by direct method) + 20% (Average attainment level by indirect method).

7. The Results of CO Attainment: The Results of CO Attainment is provided in Annexure-B

FOR EXAMPLE, COURSE CODE/TITLE: **Paper IX: DSE-E1 Mathematical Physics**

e.g., For end-term and internal examination;

- i. Level-1: 30% of students scored more than the class average**
- ii. Level-2: 40% of students score more than the class average**
- iii. Level-3: 50% of students score more than the class average**

Paper IX: DSE-E1 Mathematical Physics		
Average Marks in External examination:	26	
% Students score more than 26 is =5	100	Level: 3
Average Marks in Internal examination	9	
% Students score more than 9 is =4	80	Level: 3
A(CO) Paper IX: DSE-E1 Mathematical Physics		
	=	80% (3) +20 (3)
	=	2.4+0.6
	=	3

Paper IX: DSE-E2 Quantum Mechanics		
Average Marks in External examination:	38	
% Students score more than 38 is = 3	75	Level: 3
Average Marks in Internal examination	9	
% Students score more than 9 is =4	100	Level: 3
A(CO) DSE-E2 Quantum Mechanics		
	=	80% (3) +20 (3)
	=	2.4+0.6
	=	3

Paper No. XI: DSE-E3 Classical Mechanics and Classical Electrodynamics		
Average Marks in External examination:	35	
% Students score more than 35 is =4	80	Level: 3
Average Marks in Internal examination	9	
% Students score more than 9 is =4	80	Level: 3
A(CO) Paper No. XI: DSE-E3 Classical Mechanics and Classical Electrodynamics		
	=	80% (3) +20%(3)
	=	2.4+0.6
	=	3

Paper XII : DSE-E4 Digital and Analog Circuits and Instrumentation		
Average Marks in External examination:	28	
% Students score more than 28 is = 03	60	Level: 3
Average Marks in Internal examination	9	
% Students score more than 9 is =4	80	Level: 3
A(CO) DSE-E4 Digital and Analog Circuits and Instrumentation		
	=	80% (3) +20 (3)
	=	2.4+0.6
	=	3

Paper XIII: DSE-F1 Nuclear and Particle Physics		
Average Marks in External examination:	31	
% Students score more than 31 is =2	50	Level: 3
Average Marks in Internal examination	9	
% Students score more than 9 is =2	50	Level: 3
A(CO) Paper XIII: DSE-F1 Nuclear and Particle Physics		
	=	80% (3) +20 (3)
	=	2.4+0.6
	=	3

Paper XIV: DSE-F2 Solid State Physics		
Average Marks in External examination:	36	
% Students score more than 36 is = 03	75	Level: 3
Average Marks in Internal examination	9	
% Students score more than 9 is =2	50	Level: 3
A(CO) Paper XIV: DSE-F2 Solid State Physics		
	=	80% (3) +20 (3)
	=	2.4+0.6
	=	3

Paper XV: DSE-F3 Atomic and Molecular Physics and Astrophysics		
Average Marks in External examination:	31	
% Students score more than 31 is =3	75	Level: 3
Average Marks in Internal examination	9	
% Students score more than 9 is =2	50	Level: 3
A(CO) Paper XV: DSE-F3 Atomic and Molecular Physics and Astrophysics		
	=	80% (3) +20 (3)
	=	2.4+0.6
	=	3

Paper XVI: DSE-F4 Energy Studies and Materials Science		
Average Marks in External examination:	39	
% Students score more than 39 is=3	75	Level: 3
Average Marks in Internal examination	9	
% Students score more than 9 is 2	50	Level: 3
A(CO) Paper XVI: DSE-F4 Energy Studies and Materials Science		
	=	80% (3) +20 (3)
	=	2.4+0.6
	=	3

Physics Practical		
Average Marks in External examination:	181	
% Students score more than 181 is =2	50	Level: 3

Hence, the attainment level is Level-3 and the set target level is Level-2 and therefore the CO is Fully attained.

Table No. 1.0: CO Attainment Level

Course Title	Target Attainment	Course Attainment		Fully Attained/ Not Attained	Remedial Measures
	Level	Value	level		
DSE-E1 Mathematical Physics	2	3	3	Fully Attained	
DSE-E2 Quantum Mechanics	2	3	3	Fully Attained	
DSE-E3 Classical Mechanics and Classical Electrodynamics	2	3	3	Fully Attained	
DSE-E4 Digital and Analog Circuits and Instrumentation	2	3	3	Fully Attained	
DSE-F1 Nuclear and Particle Physics	2	3	3	Fully Attained	
DSE-F2 Solid State Physics	2	3	3	Fully Attained	
DSE-F3 Atomic and Molecular Physics and Astrophysics	2	3	3	Fully Attained	
DSE-F4 Energy Studies and Materials Science	2	3	3	Fully Attained	
Physics Practical	2	3	3	Fully Attained	

8. The Results of PO Attainment:

The Results of PO attainment are provided in Annexure-B

FOR EXAMPLE: PO NO.: a (Note: Refer to point No. 11 above which describes the attainment level and set target attainment level).

PO Attainment= 80% (Average attainment level by direct method) + 20% (Average attainment level by indirect method).

(PSO -A) = 80% (3+3+3+3+3+3+3+3+3)/09 + 20% (3+3+3+3+3+3+3+3+3)/8 = 80% (3) + 20% (3) = 3 i.e. Level-5. The Target Level is Level-3.

Hence, PO is attained

(PSO -B) = 80% (3+3+3+3+3+3+3)/07 + 20% (3+3+3+3+3+3+3+3+3)/9 = 80% (3) + 20% (3) = 3 i.e. Level-5. The Target Level is Level-3.

(PSO -C) = 80% (3+3+3+3+3+3+3+3+3)/09 + 20% (3+3+3+3+3+3+3+3+3)/8 = 80% (3) + 20% (3) = 3 i.e. Level-5. The Target Level is Level-3.

(PSO -D) = 80% (3+3+3+3+3)/05 + 20% (3+3+3+3+3)/5 = 80% (3) + 20% (3) = 3 i.e. Level-5. The Target Level is Level-3.

(PSO -E) = 80% (3+3+3+3+3+3+3)/07 + 20% (3+3+3+3+3+3+3)/7 = 80% (3) + 20% (3) = 3 i.e. Level-5. The Target Level is Level-3.

(PSO -F) = 80% (3+3+3+3+3+3+3)/06 + 20% (3+3+3+3+3+3)/6 = 80% (3) + 20% (3) = 3 i.e. Level-5. The Target Level is Level-3.

(PSO -G) = 80% (3+3+3+3+3+3+3+3+3)/09 + 20% (3+3+3+3+3+3+3+3+3)/8 = 80% (3) + 20% (3) = 3 i.e. Level-5. The Target Level is Level-3.

(PSO -H) = 80% (3+3+3+3+3+3+3+3+3)/09 + 20% (3+3+3+3+3+3+3+3+3)/8 = 80% (3) + 20% (3) = 3 i.e. Level-5. The Target Level is Level-3.

Table No. 2.0 PO Attainment Level

PO/PSO Number	Target Attainment	PO/PSOs Attainment		Fully Attained/ Not Attained	Remedial Measures
	Level	Value	Level		
PSO -A	3	3	5	Fully Attained	
PSO -B	3	3	5	Fully Attained	
PSO -C	3	3	5	Fully Attained	
PSO -D	3	3	5	Fully Attained	
PSO -E	3	3	5	Fully Attained	
PSO -F	3	3	5	Fully Attained	
PSO -G	3	3	5	Fully Attained	
PSO -H	3	3	5	Fully Attained	

9. Planned Actions for Course Attainment:

The courses for which the level attained is less than Level-2, the remedial measures will be taken in a plan way that includes, tutorials, assignments, field work, and remedial coaching.

10. Planned Actions for Program Outcome Attainment: Not Applicable.

ANNEXURE-B RESULTS OF CO-PO ATTAINMENT

Sr. No	Course Title	PSO - A	PSO - B	PSO - C	PSO - D	PSO - E	PSO - F	PSO - G	PSO - H
1.	DSE-E1 Mathematical Physics	3	3	3				3	3
2.	DSE-E2 Quantum Mechanics	3	3	3	3	3		3	3
3.	DSE-E3 Classical Mechanics and Classical Electrodynamics	3		3	3	3		3	3
4.	DSE-E4 Digital and Analog Circuits and Instrumentation	3	3	3			3	3	3
5.	DSE-F1 Nuclear and Particle Physics	3		3		3	3	3	3
6.	DSE-F2 Solid State Physics	3	3	3		3	3	3	3
7.	DSE-F3 Atomic and Molecular Physics and Astrophysics	3	3	3	3	3	3	3	3
8.	DSE-F4 Energy Studies and Materials Science	3	3	3	3	3	3	3	3
9.	Physics Practical	3	3	3	3	3	3	3	3
	Average	3	3	3	3	3	3	3	3

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HEAD

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