2.6.2 Attainment of program outcomes, program specific outcomes and course outcomes are evaluated by the institution

(Year 2023-24)

Attainment levels:

For University Exam

Level 1	below 45 % Students scoring more than 60% marks
Level 2	45-60 % Students scoring more than 60% marks
Level 3	≥ 60% Students scoring more than 60% marks

For Internal Exam

Level 1	below 60 % Students scoring more than 60% marks
Level 2	60-80 % Students scoring more than 60% marks
Level 3	Above 80% Students scoring more than 60% marks

Program Outcome Level	Target Attainment (Exclusive Method)
Level 1	0.5- 1.0
Level 2	1.0 - 1.5
Level 3	1.5 -2.0
Level 4	2.0- 2.5
Level 5	2.5 -3.0

DR. PATANGRAO KADAM MAHAVIDYALAYA BHARATI VIDYAPEETH PUNE SANGLI

Department of Physics

Calculation for Program Outcome Attainment for the Year 2023-24 (B. Sc. III Physics)

Attainment of course outcome									
Semester (Theory)	**Course Code (Paper No.)**	**Course Title**	**% of students above 60% University marks**	**Level of Attainment**	**80% of Attainment Level in End term exam (I)**	**% of students above 60% internal marks**	**Level of attainment**	**20% of Attainment Level in internal exam (II)**	**Attainment of Course (I+II)**
Semester V (Theory)	**Paper IX**	**Mathematical Physics**	50	2	**1.6**	100	3	**0.6**	**2.2**
	Paper-X	**Quantum Mechanics**	67	3	**2.4**	100	3	**0.6**	**3**
	Paper-XI	**Classical Mechanics and Classical Electrodynamics**	50	2	**1.6**	100	3	**0.6**	**2.2**
	Paper-XII	**Digital and Analog Circuits and Instrumentation**	50	2	**1.6**	100	3	**0.6**	**2.2**
Semester VI (Theory)	**Paper-XIII**	**Nuclear and Particle Physics**	33	1	**0.8**	100	3	**0.6**	**1.4**
	Paper-XIV	**Solid State Physics**	50	2	**1.6**	100	3	**0.6**	**2.2**
	Paper-XV	**Atomic and Molecular Physics and Astrophysics**	100	3	**2.4**	100	3	**0.6**	**3**
	Paper-XVI	**Energy Studies and Materials Science**	50	2	**1.6**	100	3	**0.6**	**2.2**
								Total	**18.4**
								Average	**2.3**

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MAPPING

Rubrics developed to validate POs for B.Sc. Programmes

Correlation level 1, 2 and 3 are defined as follows:
1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

Assessment Tools:

Program Outcomes	Courses Considered	Method of Assessment	Source of data collection
PO 1-PO 6	For each PO, the contributing course is obtained from CO to PO mapping	1) Direct Assessment Internal evaluation • Unit Tests • Assignments 2) External Evaluation University Exam	Result file and University Ledger

Mapping Factor (Correlation Level):

It indicates to what extent ascertain component (either assessment method to CO or CO to PO or CO to PSO)

3: Indicates Substantial (high) mapping (high contribution towards attainment)

2: Indicates Moderate (medium) mapping (medium contribution towards attainment)

1: Indicates Slight (low) mapping (some contribution towards attainment)

Calculation for Program Outcome Attainment for the Year 2023-24 (B. Sc. III Physics)

CO's are mapped with CIE (Continuous internal evaluation) marks as follows

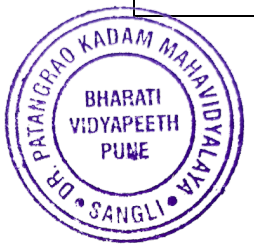
1] Physics: Sem. V and VI

Paper IX: Mathematical Physics

Course Outcomes	Test 1	HA 1	HA 2	Average
CO 1	3	3		3
CO 2	3	3		3
CO 3	3		3	3
CO 4	3		3	3
Total Average	**3**	**3**	**3**	**3**

Paper X: Quantum Mechanics

Course Outcomes	Test 1	HA 1	HA 2	Average
CO 1	3	3		3
CO 2	3	3		3
CO 3	3		3	3
CO 4	3		3	3
Total Average	**3**	**3**	**3**	**3**



Paper XI: Classical Mechanics and Classical Electrodynamics

Course Outcomes	Test 1	HA 1	HA 2	Average
CO 1	3	3		3
CO 2	3	3		3
CO 3	3		3	3
CO 4	3		3	3
Total Average	**3**	**3**	**3**	**3**

Paper XII: Digital and Analog Circuits and Instrumentation

Course Outcomes	Test 1	HA 1	HA 2	Average
CO 1	3	3		3
CO 2	3	3		3
CO 3	3		3	3
CO 4	3		3	3
Total Average	**3**	**3**	**3**	**3**

Paper XIII: Nuclear and Particle Physics

Course Outcomes	Test 1	HA 1	HA 2	Average
CO 1	3	3		3
CO 2	3	3		3
CO 3	3		3	3
CO 4	3		3	3
Total Average	**3**	**3**	**3**	**3**

Paper XIV: Solid State Physics

Course Outcomes	Test 1	HA 1	HA 2	Average
CO 1	3	3		3
CO 2	3	3		3
CO 3	3		3	3
CO 4	3		3	3
Total Average	**3**	**3**	**3**	**3**

Paper XV: Atomic and Molecular Physics and Astrophysics

Course Outcomes	Test 1	HA 1	HA 2	Average
CO 1	3	3		3
CO 2	3	3		3
CO 3	3		3	3
CO 4	3		3	3
Total Average	**3**	**3**	**3**	**3**

Paper XVI: Energy Studies and Materials Science

Course Outcomes	Test 1	HA 1	HA 2	Average
CO 1	3	3		3
CO 2	3	3		3
CO 3	3		3	3
CO 4	3		3	3
Total Average	**3**	**3**	**3**	**3**

Step 2]: COs are mapped with POs. The CO levels corresponding to each PO are averaged to obtain overall CO level for each PO as follows:

1]

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	-	3	-	3	3	-	-	-	-
CO2	3	3	3	-	3	-	3	3	-	-	-	-
CO3	3	-	3	-	3	-	3	3	-	-	-	-
CO4	3	3	3	-	3	-	3	3	-	-	-	-
Paper IX	**3**	**3**	**3**	**-**	**3**	**-**	**3**	**3**	**-**	**-**	**-**	**-**

2]

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	-	3	-	3	3	-	-	3	-
CO2	3	3	3	-	3	-	3	3	-	-	-	-
CO3	3	-	3	-	-	-	3	3	-	-	-	-
CO4	3	-	3	-	-	-	3	3	-	-	-	-
Paper X	**3**	**3**	**3**	**-**	**3**	**-**	**3**	**3**	**-**	**-**	**3**	**-**

3]

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	-	-	-	3	3	3	3	3	3
CO2	3	3	3	-	-	-	3	3	-	-	-	-
CO3	3	3	3	-	3	-	3	3	-	-	-	-
CO4	3	3	3	-	-	-	3	3	3	3	3	-
Paper XI	**3**	**3**	**3**	**-**	**3**	**-**	**3**	**3**	**3**	**3**	**3**	**3**

4]

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	-	-	-	3	3	-	3	3	-
CO2	3	3	3	-	-	-	3	3	-	3	3	-
CO3	3	3	3	-	-	-	3	-	3	3	3	3
CO4	3	3	-	-	-	-	3	3	-	3	3	3
Paper XII	**3**	**3**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**	**3**

5]

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	-	3	-	3	3	-	-	3	3
CO2	3	3	3	-	3	-	3	3	-	3	3	3
CO3	3	3	3	-	3	-	3	3	-	3	3	3
CO4	3	3	3	-	3	-	3	-	-	-	-	-
Paper XIII	**3**	**3**	**3**	**-**	**3**	**-**	**3**	**3**	**-**	**3**	**3**	**3**

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Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	-	3	-	3	3	-	3	3	-
CO2	3	3	3	-	3	-	3	3	-	3	3	-
CO3	3	3	3	-	3	-	3	3	-	3	3	3
CO4	3	3	3	-	3	-	3	3	-	3	3	3
Paper XIV	**3**	**3**	**3**	**-**	**3**	**-**	**3**	**3**	**-**	**3**	**3**	**3**

7]

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	-	3	-	3	3	3	3	3	3
CO2	3	3	-	-	3	-	3	3	3	3	3	3
CO3	3	3	-	-	3	-	3	3	3	3	3	3
CO4	3	-	-	-	3	-	3	3	-	-	-	-
Paper XV	**3**	**3**	**3**	**-**	**3**	**-**	**3**	**3**	**3**	**3**	**3**	**3**

8]

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	-	3	-	3	3	-	3	-	-
CO2	3	3	3	-	3	-	3	3	-	3	-	-
CO3	3	3	3	-	3	-	3	3	3	3	3	3
CO4	3	3	3	-	3	-	3	3	3	3	3	3
Paper XVI	**3**	**3**	**3**	**-**	**3**	**-**	**3**	**3**	**3**	**3**	**3**	**3**

Step 3] Development of overall CO-PO mapping matrix for all courses of Physics

The overall CO levels obtained for all courses from above step can be expressed in matrix form.

Courses	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
Paper IX	3	3	3	-	3	-	3	3	-	-	-	-
Paper X	3	3	3	-	3	-	3	3	-	-	3	-
Paper XI	3	3	3	-	3	-	3	3	3	3	3	3
Paper XII	3	3	3	-	-	-	3	3	3	3	3	3
Paper XIII	3	3	3	-	3	-	3	3	-	3	3	3
Paper XIV	3	3	3	-	3	-	3	3	-	3	3	3
Paper XV	3	3	3	-	3	-	3	3	3	3	3	3
Paper XVI	3	3	3	-	3	-	3	3	3	3	3	3
Average	**3**	**3**	**3**	**-**	**3**	**-**	**3**	**3**	**3**	**3**	**3**	**3**

Target Attainment Level of all the Departments

Name of Department	Average Attainment of Course	Average attainment by indirect method	80% of Average attainment of Course (I)	20% of Average attainment of indirect method (II)	Average PO Attainment (I+II)	Target Attainment Level
Physics	**2.3**	**3**	**1.84**	**0.6**	**2.44**	**Level 4**

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