Program Outcomes for MSc Applied Physics

PO1. Scientific and Engineering knowledge: Apply the basic and advanced knowledge to complex scientific and engineering problems.

PO2. Problem analysis: Identify, formulate, simulate and analyse the problems using modern Physics techniques.

PO3. Design/development of solutions: Interpret, design and develop own solutions independently to trivial and non-trivial problems.

PO4. Conduct investigations of complex problems using modern experimental and computational skills.

PO5. Modern tool usage & Ethics: Recognise the modern tools and learn to use them at right place as per the ethos of the country.

PH 97105 Classical and statistical Mechanics

Course Objective (CO): The objective of this course is to

1. provide knowledge of fundamental and applied concepts of classical and statistical physics
2. demonstrate theoretical laws of classical and statistical physics for predicting the motions of bodies.

3. explain of the fundamental concepts in the dynamics of system of particles, motion of rigid body, Lagrangian and Hamiltonian dynamics.
4. cultivate the understanding of macroscopic and microscopic states, the contacts of statistics and thermodynamics, classical ideal gas, Gibbs distribution and partition function

	CO	PO1	PO2	PO3	PO4	PO5
PH 97105CSM	PH 97105.1	2	1	1	2	0
	PH 97105.2	1	2	2	1	0
	PH 97105.3	1	2	2	1	0
	PH 97105.4	2	3	1	1	1
	Target	1.5	2	1.5	1.25	0.25

1.3

Classical and Statistical Mechanics											
PH- 97105											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	Q1		Q2		Q3		Q4		Q5		Total/70
0801PH21MS01	11	1	12	1	10	1	13	1	10	1	**56**
0801PH21MS02	11	1	10	1	9	1	11	1	13	1	**54**
0801PH21MS03	9	0	8	0	7	0	8	0	10	0	**42**
SUM	31	2	30	2	26	2	32	2	33	2	**152**

Avrg	10.3	0.7	10	0.7	8.7	0.7	10.7	0.7	11.0	0.7

		I	II	III	IV	V	AVR	1	2	3
I,V	**CO1**	0.7				0.7	0.7	0.7	1.4	2.1
II	**CO2**		0.7				0.7	0.7	1.4	2.1
III	**CO3**			0.7			0.7	0.7	1.4	2.1
IV,V	**CO4**				0.7	0.7	0.7	0.7	1.4	2.1

	CO	PO1	PO2	PO3	PO4	PO5	
PH- 97105	**CO1**	1.4	0.7	0.7	1.4	0	
	CO2	0.7	1.4	2.1	0.7	0	
	CO3	0.7	1.4	2.1	0.7	0	
	CO4	1.4	2.1	0.7	0.7	0.7	
	PO Attaintm	1.05	1.4	1.4	0.875	0.175	0.98

PO Attainment = Achieved/Target X 100 % = 75 %

PH 97106: ELECTRONICS AND COMMUNICATION ENGINEERING

Course Objective (CO): The objective of this course is to

1. introduce the concepts of modulation, demodulation with knowledge of operational amplifier.
2. demonstrate the use of operational amplifier in digital devices along with its applications.
3. explain the laws and theorems of digital electronics and their applications.
4. develop the understanding of flip-flops, multibreathers, timers and registers

	CO	PO1	PO2	PO3	PO4	PO5
PH 97106	PH 97106.1	3	2	1	1	0
	PH 97106.2	2	2	3	1	1
	PH 97106.3	2	2	3	0	0
	PH 97106.4	1	2	1	1	1
	Target	2	2	2	0.75	0.5

1.45

Communication and Digital Electronics										
PH- 97106										
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	Q1		Q2		Q3		Q4		Q5		Total/70
0801PH21MS01	13	1	12	1	13	1	13	1	11	1	**62**
0801PH21MS02	10	1	12	1	10	1	10	0	11	0	**53**
0801PH21MS03	9	0	8	0	7	0	11	1	13	1	**48**
	32	2	32	2	30	2	34	2	35	2	**163**

	10.7	0.7	10.7	0.7	10.0	0.7	11.3	0.7	11.7	0.7	

		I	II	III	IV	V	AVR	1	2	3	
I,V	**CO1**	0.7				0.7	0.7	0.7	1.4	2.1	
II	**CO2**		0.7				0.7	0.7	1.4	2.1	
III	**CO3**			0.7			0.7	0.7	1.4	2.1	
IV,V	**CO4**				0.7	0.7	0.7	0.7	1.4	2.1	

	CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	
PH- 97106	**CO1**	2.1	1.4	0.7	0.7	0	
	CO2	1.4	1.4	2.1	0.7	0.7	
	CO3	1.4	1.4	2.1	0	0	
	CO4	0.7	1.4	0.7	0.7	0.7	
	PO Attaint	1.4	1.4	1.4	0.525	0.35	1.015

PO Attainment = Achieved/Target X 100 % = 70 %

PH 97107: ELECTRODYAMICS AND RELATIVITY

Course Objective (CO): The objective of this course is to

1. introduce the concept of time varying fields and apply this concept to derive Maxwell's equations.
2. demonstrate Maxwell's equation and describe the EM wave propagation in different media.
3. explain the reflection and refraction of EM wave from the boundaries of the media and its dispersion in dielectric conductors and plasma.
4. develop the basic understanding of special theory of relativity and tensor notation for covariance formulation of classical theories.

	CO	PO1	PO2	PO3	PO4	PO5
PH 97107EDR	PH 97107.1	1	0	1	1	0
	PH 97107.2	2	1	2	1	0
	PH 97107.3	2	1	1	1	0
	PH 97107.4	1	1	1	2	1
	Target	1.5	0.75	1.25	1.25	0.25

1

Electrodynamics and Relativity											
PH- 97107											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	Q1		Q2		Q3		Q4		Q5		Total/70
0801PH21MS01	10	1	11	1	10	1	12	1	11	1	54
0801PH21MS02	12	1	13	1	11	1	12	1	12	1	60
0801PH21MS03	8	0	7	0	9	0	10	0	6	0	40

	30	2	31	2	30	2	34	2	29	2	154
	10.0	0.7	10.3	0.7	10.0	0.7	11.3	0.7	9.7	0.7	

		I	II	III	IV	V	AVR	1	2	3
I,V	CO1	0.7				0.7	0.7	0.7	1.4	2.1
II	CO2		0.7				0.7	0.7	1.4	2.1
III	CO3			0.7			0.7	0.7	1.4	2.1
IV,V	CO4				0.7	0.7	0.7	0.7	1.4	2.1

	CO	PO1	PO2	PO3	PO4	PO5	
PH- 97107	CO1	0.7	0	0.7	0.7	0	
	CO2	1.4	0.7	1.4	0.7	0	
	CO3	1.4	0.7	0.7	0.7	0	
	CO4	0.7	0.7	0.7	1.4	0.7	
	PO Attaint	1.05	0.525	0.875	0.875	0.175	0.7

PO Attainment = Achieved/Target X 100 % = 70 %

PH 97108: MATHEMATICAL METHODS AND NUMERICAL ANALYSIS

Course Objective (CO): The objective of this course is to

1. learn the fundamentals of Fourier series, Fourier and Laplace transforms, their inverse transforms.
2. gain insight of curvilinear coordinates, vector algebra and their typical applications in physics.
3. introduced special functions and their recurrence relations for applicability in different areas of physics.
4. have a grasp of the basic elements of complex analysis and learn about the type of matrices and tensors.

	CO	PO1	PO2	PO3	PO4	PO5	
PH 97108MMNA	PH 97108.1	1	0	1	2	0	
	PH 97108.2	1	1	1	1	0	
	PH 97108.3	1	1	1	0	1	
	PH 97108.4	1	2	1	2	1	
	Target	1	1	1	1.25	0.5	**0.95**

Mathematical Methods and Numerical Analysis											
PH- 97108											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	**Q1**		**Q2**		**Q3**		**Q4**		**Q5**		**Total/70**
0801PH21MS01	13	1	14	1	14	1	14	1	10	1	**65**
0801PH21MS02	9	0	8	0	10	1	9	0	7	0	**43**
0801PH21MS03	6	0	5	0	4	0	10	0	7	0	**32**
	28	1	27	1	28	2	33	1	24	1	**140**
	9.3	0.3	9.0	0.3	9.3	0.7	11.0	0.3	8.0	0.3	

		I	II	III	IV	V	AVR	1	2	3
I,V	CO1	0.3				0.3	0.3	0.3	0.6	0.9
II	CO2		0.3				0.3	0.3	0.6	0.9
III	CO3			0.7			0.7	0.7	1.4	2.1
IV,V	CO4				0.3	0.3	0.3	0.3	0.6	0.9

	CO	PO1	PO2	PO3	PO4	PO5	
PH- 97108	CO1	0.3	0	0.3	0.6	0	
	CO2	0.3	0.3	0.3	0.3	0	
	CO3	0.7	0.7	0.7	0	0.7	
	CO4	0.7	1.4	0.7	1.4	0.7	
	PO Attaint	0.5	0.6	0.5	0.575	0.35	0.505

PO Attainment = Achieved/Target X 100 % = 53 %

PH 97205: Atomic and Molecular Physics

Course Objective (CO): The objective of this course is to

1. apply quantum mechanics for structural understanding of atoms and molecules.
2. demonstrate vibrational, rotational, and electronic states spectra of atoms and molecules.
3. explain the nuclear spin for the understanding of hyperfine spectra of atoms and molecules.
4. develop the understanding of X-ray and Raman spectra

	CO	PO1	PO2	PO3	PO4	PO5
PH 97205 AMP	PH 97205.1	2	1	0	1	0
	PH 97205.2	1	1	0	1	0
	PH 97205.3	2	2	1	1	1
	PH 97205.4	2	2	1	2	1
	Target	1.75	1.5	0.5	1.25	0.5

1.1

Atomic and Molecular Physics										
PH- 97205										
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	Q1		Q2		Q3		Q4		Q5		Total/70
0801PH21MS01	13	1	12	1	10	1	11	1	11	1	57
0801PH21MS02	13	1	12	1	14	1	13	1	12	1	64
0801PH21MS03	7	0	6	0	6	0	7	0	8	0	34
Total	33	2	30	2	30	2	31	2	31	2	155
Avg	11.0	0.7	10.0	0.7	10.0	0.7	10.3	0.7	10.3	0.7	

		I	II	III	IV	V	AVR	1	2	3
I,V	CO1	0.7				0.7	0.7	0.7	1.4	2.1
II	CO2		0.7				0.7	0.7	1.4	2.1
III	CO3			0.7			0.7	0.7	1.4	2.1
IV,V	CO4				0.7	0.7	0.7	0.7	1.4	2.1

	CO	PO1	PO2	PO3	PO4	PO5	
PH- 97205	CO1	1.4	0.7	0	0.7	0	
	CO2	0.7	0.7	0	0.7	0	
	CO3	1.4	1.4	0.7	0.7	0.7	
	CO4	1.4	1.4	0.7	1.4	0.7	
	PO Attaint	1.225	1.05	0.35	0.875	0.35	**0.77**

PO Attainment = Achieved/Target X 100 % = 70 %

PH 97207- Computer Programming

Course Objective (CO): The objective of this course is to

1. develop the concepts of computer basics & programming with particular attention to Engineering examples.
2. skill the students for programming in C++, MatLAB, MathCAD, LabVIEW and COMSOL Multiphysics.
3. explain the working of i/p, o/p devices and recognize the basic terminology used in computer programming.
4. develop the understanding of various 1D, 2D models and wave propagation under boundary conditions.

	CO	PO1	PO2	PO3	PO4	PO5
PH 97206 CP	PH 97206.1	2	1	1	0	0
	PH 97206.2	2	2	1	2	2
	PH 97206.3	1	2	2	2	1
	PH 97206.4	1	2	1	2	1
	Target	1.5	1.75	1.25	1.5	1

1.4

Computer Programming											
PH- 97206											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	Q1		Q2		Q3		Q4		Q5		Total/70
0801PH21MS01	12	1	12	1	13	1	13	1	11	1	**61**
0801PH21MS02	12	1	11	1	10	0	13	1	11	1	**57**
0801PH21MS03	9	0	10	0	11	0	10	0	7	0	**47**
Total	33	2	33	2	34	1	36	2	29	2	**165**

Avg	11.0	0.7	11.0	0.7	11.3	0.3	12.0	0.7	9.7	0.7	

		I	II	III	IV	V	AVR	1	2	3	
I,V	**CO1**	0.7				0.7	0.7	0.7	1.4	2.1	
II	**CO2**		0.7				0.7	0.7	1.4	2.1	
III	**CO3**			0.3			0.3	0.3	0.6	0.9	
IV,V	**CO4**				0.7	0.7	0.7	0.7	1.4	2.1	

PH- 97206

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	
CO1	1.4	0.7	0.7	0	0	
CO2	1.4	1.4	0.7	1.4	1.4	
CO3	0.3	0.6	0.6	0.6	0.3	
CO4	0.7	1.4	0.7	1.4	0.7	
PO Attaint	0.95	1.025	0.675	0.85	0.6	**0.82**

PO Attainment = Achieved/Target X 100 % = 59 %

PH97207 **Quantum Mechanics**

CO1 apply quantum mechanics for the understanding of spherically symmetric potential.
CO2 demonstrate spin and angular momentum operator and their commutation relations.
CO3 explain the approximation and variational principle and the scattering theory.
CO4 develop the understanding of Dirac's relativistic Hamiltonian and relativistic wave equation.

	CO	PO1	PO2	PO3	PO4	PO5
PH97207QM	PH 97207.1	2	2	1	3	2
	PH 97207.2	1	2	1	2	1
	PH 97207.3	2	1	1	2	1
	PH 97207.4	1	2	1	1	1
	Target	1.5	1.8	1	2	1.3

1.52

Quantum Mechanics											
PH- 97207											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	Q1		Q2		Q3		Q4		Q5		Total/70
0801PH21MS01	10	1	11	1	12	1	10	1	10	1	**53**
0801PH21MS02	9	1	11	1	10	1	10	1	9	1	**49**

0801PH21MS03	7	0	6	0	8	0	7	0	7	0	**35**
Total	26	2	28	2	30	2	27	2	26	2	**137**
Avg	8.7	0.7	9.3	0.7	10.0	0.7	9.0	0.7	8.7	0.7	

		I	II	III	IV	V	AVR	1	2	3	
I,V	**CO1**	0.7				0.7	0.7	0.7	1.4	2.1	
II	**CO2**		0.7				0.7	0.7	1.4	2.1	
III	**CO3**			0.7			0.7	0.7	1.4	2.1	
IV,V	**CO4**				0.7	0.7	0.7	0.7	1.4	2.1	

	CO	PO1	PO2	PO3	PO4	PO5	
PH- 97207	**CO1**	1.4	1.4	0.7	2.1	1.4	
	CO2	0.7	1.4	0.7	1.4	0.7	
	CO3	1.4	0.7	0.7	1.4	0.7	
	CO4	0.7	1.4	0.7	0.7	0.7	
	PO Attaint	1.05	1.22	0.7	1.4	0.8	**1.034**

PO Attainment = Achieved/Target X 100 % = 68 %

PH97208 **Solid State Physics**

CO1 cultivate the basics of energy band formation, principle crystallography and crystal diffraction.
CO2 gain insight of phonons and their dynamics, and to evaluate their dispersive and thermal properties.
CO3 calculate thermal and electrical properties in the free-electron model.
CO4 comprehend the basic concepts of superconductivity and related phenomena and its applications.

	CO	PO1	PO2	PO3	PO4	PO5	
PH97208SSp	PH 97208.1	2	2	2	3	2	
	PH 97208.2	1	2	2	2	1	
	PH 97208.3	3	3	2	2	2	
	PH 97208.4	2	2	2	2	2	
	Target	2	2.25	2	2.25	1.75	**2.05**

Solid State Physics											
PH- 97208											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	**Q1**		**Q2**		**Q3**		**Q4**		**Q5**		**Total/70**
0801PH21MS01	13	1	12	1	12	1	13	1	14	1	**64**
0801PH21MS02	10	1	12	1	11	1	13	1	11	1	**57**
0801PH21MS03	7	0	6	0	6	0	7	0	9	0	**35**
Total	30	2	30	2	29	2	33	2	34	2	**156**
Avg	10.0	0.7	10.0	0.7	9.7	0.7	11.0	0.7	11.3	0.7	

		I	II	III	IV	V	AVR	1	2	3	
I,V	CO1	0.7				0.7	0.7	0.7	1.4	2.1	
II	CO2		0.7				0.7	0.7	1.4	2.1	
III	CO3			0.7			0.7	0.7	1.4	2.1	
IV,V	CO4				0.7	0.7	0.7	0.7	1.4	2.1	

	CO	PO1	PO2	PO3	PO4	PO5	
PH- 97208	CO1	1.4	1.4	1.4	2.1	1.4	
	CO2	0.7	1.4	1.4	1.4	0.7	
	CO3	2.1	2.1	1.4	1.4	1.4	
	CO4	1.4	1.4	1.4	1.4	1.4	
	PO Attaint	1.4	1.6	1.4	1.6	1.2	**1.44**

PO Attainment = Achieved/Target X 100 % = 70 %

PH97305 **Nuclear and Particle Physics**

CO1 allow students to develop a strong footing in the fundamentals of nuclear forces.
CO2 gain insight about the basic properties of nuclei and nuclear structure.
CO3 develop the capability of elementary problem solving in nuclear and particle physics.
CO4 comprehend the basic concepts of nuclear physics for relating theoretical predictions and measurement results.

	CO	PO1	PO2	PO3	PO4	PO5	
PH97305NPP	PH 97305.1	1	1	0	2	1	
	PH 97305.2	1	2	0	1	2	
	PH 97305.3	2	2	1	3	1	
	PH 97305.4	2	2	1	2	1	
	Target	1.5	1.8	0.5	2	1.25	**1.41**

Nuclear											
PH- 97305											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	Q1		Q2		Q3		Q4		Q5		Total/70
0801PH21MS01	13	1	13	1	11	1	11	1	10	1	**58**
0801PH21MS02	12	1	10	1	14	1	13	1	12	1	**61**
0801PH21MS03	7	0	8	0	7	0	10	0	12	1	**44**
Total	32	2	31	2	32	2	34	2	34	3	**163**
Avg	10.7	0.7	10.3	0.7	10.7	0.7	11.3	0.7	11.3	1.0	

		I	II	III	IV	V	AVR	1	2	3
I,V	CO1	0.7				1	0.8	0.8	1.6	2.4
II	CO2		0.7				0.7	0.7	1.4	2.1
III	CO3			0.7			0.7	0.7	1.4	2.1
IV,V	CO4				0.7	1	0.8	0.8	1.6	2.4

PH- 97305

CO	PO1	PO2	PO3	PO4	PO5
CO1	0.8	0.8	0	1.6	0.8
CO2	0.8	1.6	0	0.8	1.6
CO3	1.6	1.6	0.8	2.4	0.8
CO4	1.6	1.6	0.8	1.6	0.8
PO Attaint	1.2	1.4	0.4	1.6	1

1.12

PO Attainment = Achieved/Target X 100 % = 79 %

PH97306 **Fiber and Integrated Optics**

CO1	deliver the knowledge about optical waveguide and TE, TM mode propagation.
CO2	gain insight about the basic properties of optical fiber waveguide and their mode analysis.
CO3	develop elementary problem-solving capability of EM propagation in waveguide and anisotropic medium.
CO4	comprehend the basic concepts of integrated optics for directional coupler and coupled wave theory

	CO	PO1	PO2	PO3	PO4	PO5	
PH97306FIO	PH 97306.1	3	2	2	1	2	
	PH 97306.2	2	3	1	2	2	
	PH 97306.3	2	2	1	2	1	
	PH 97306.4	2	1	2	2	2	
	Target	2.3	2	1.5	1.8	1.8	**1.88**

Fiber and Integrated Optics											
PH- 97306											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	**Q1**		**Q2**		**Q3**		**Q4**		**Q5**		**Total/70**
0801PH21MS01	10	1	10	1	11	1	9	0	10	1	**50**
0801PH21MS02	11	1	10	1	10	1	11	1	10	1	**52**
0801PH21MS03	6	0	5	0	5	0	10	1	9	0	**35**

Total	27	2	25	2	26	2	30	2	29	3	**137**
Avg	9.0	0.7	8.3	0.7	8.7	0.7	10.0	0.7	9.7	0.7	

		I	II	III	IV	V	AVR	1	2	3	
I,V	**CO1**	0.7				0.7	0.7	0.7	1.4	2.1	
II	**CO2**		0.7				0.7	0.7	1.4	2.1	
III	**CO3**			0.7			0.7	0.7	1.4	2.1	
IV,V	**CO4**				0.7	0.7	0.7	0.7	1.4	2.1	

PH- 97306

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	
CO1	2.1	1.4	1.4	0.7	1.4	
CO2	1.4	2.1	0.7	1.4	1.4	
CO3	1.4	1.4	0.7	1.4	0.7	
CO4	1.4	0.7	1.4	1.4	1.4	
PO Attaint	1.6	1.4	1.1	1.2	1.2	**1.3**

PO Attainment = Achieved/Target X 100 % = 69 %

PH97307 **Nanoscience and Nano technology**

CO1 provide understanding of fundamental and applied concepts of nano materials.
develop a familiarity with the characterization tools used for the analysis of electrical optical and structural properties of
CO2 nano materials.
CO3 demonstrate the basic functioning of nano fabrication techniques.
CO4 cultivate the fundamental understanding of metal semiconductor alloys, micro and nano elector mechanical systems.

	CO	PO1	PO2	PO3	PO4	PO5	
PH97307NNT	PH 97307.1	2	2	1	3	2	
	PH 97307.2	1	3	2	2	1	
	PH 97307.3	3	2	1	2	2	
	PH 97307.4	3	2	2	2	2	
	Target	2.25	2.25	1.5	2.25	1.75	2

Nanoscience and Nano technology											
PH- 97307											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	Q1		Q2		Q3		Q4		Q5		Total/70
0801PH21MS01	10	1	12	1	11	1	13	1	12	1	58
0801PH21MS02	11	1	14	1	10	1	14	1	13	1	62
0801PH21MS03	7	0	5	0	5	0	10	0	9	0	36

Total	28	2	31	2	26	2	37	2	34	0	**156**
Avg	9.3	0.7	10.3	0.7	8.7	0.7	12.3	0.7	11.3	0.7	

		I	II	III	IV	V	AVR	1	2	3	
I,V	**CO1**	0.7				0.7	0.7	0.7	1.4	2.1	
II	**CO2**		0.7				0.7	0.7	1.4	2.1	
III	**CO3**			0.7			0.7	0.7	1.4	2.1	
IV,V	**CO4**				0.7	0.7	0.7	0.7	1.4	2.1	

	CO	PO1	PO2	PO3	PO4	PO5	
PH- 97307	**CO1**	1.4	1.4	0.7	2.1	1.4	
	CO2	0.7	2.1	1.4	1.4	0.7	
	CO3	2.1	1.4	0.7	1.4	1.4	
	CO4	2.1	1.4	1.4	1.4	1.4	
	PO Attaint	1.6	1.6	1.1	1.6	1.2	**1.42**

PO Attainment = Achieved/Target X 100 % = 71 %

PH97308 **Lasers and Applications**

CO1 Provide understanding of Einstein's A&B coefficients, population inversion in three and four level lasers.
CO2 Develop a familiarity with the Q-factor of laser oscillations, Q-switching and mode looking mechanism.
CO3 Demonstrate the basic functioning solid state, gases, and semiconductor lasers.
CO4 Cultivate the elementary understanding of nonlinear optics and versatile applications of lasers.

	CO	PO1	PO2	PO3	PO4	PO5	
PH97308NA	PH 97308.1	1	2	1	2	2	
	PH 97308.2	2	2	1	2	1	
	PH 97308.3	2	3	2	1	2	
	PH 97308.4	2	2	1	2	2	
	Target	1.75	2.25	1.25	1.75	1.75	**1.75**

Lasers and Applications											
PH- 97308											
	CO 1(14)		CO 2(14)		CO 3(14)		CO 4(14)		CO 5(14)		
S.No.	Q1		Q2		Q3		Q4		Q5		Total/70
0801PH21MS01	12	1	14	1	11	1	14	0	10	1	61
0801PH21MS02	11	1	14	1	13	1	11	1	11	1	60
0801PH21MS03	8	0	6	0	7	0	10	1	11	1	42
Total	31	2	34	2	31	2	35	2	32	3	163
Avg	10.3	0.7	11.3	0.7	10.3	0.7	11.7	0.7	10.7	1.0	

		I	II	III	IV	V	AVR	1	2	3
I,V	CO1	0.7				1	0.8	0.8	1.6	2.4
II	CO2		0.7				0.7	0.7	1.4	2.1
III	CO3			0.7			0.7	0.7	1.4	2.1
IV,V	CO4				0.7	1	0.8	0.8	1.6	2.4

	CO	PO1	PO2	PO3	PO4	PO5	
PH- 97308	CO1	0.8	1.6	0.8	1.6	1.6	
	CO2	1.6	1.6	0.8	1.6	0.8	
	CO3	1.6	2.4	1.6	0.8	1.6	
	CO4	1.6	1.6	0.8	1.6	1.6	
	PO Attaint	1.4	1.8	1	1.4	1.4	**1.4**

PO Attainment = Achieved /Target X 100 % = 80 %

MSC Physics Co Po Attainment Year 2021-23

S.No.	Subject	Subject Code	Target	Achived	Percentage
1	CSM	PH97105	1.3	0.98	75
2	CDE	PH97106	1.45	1.015	70
3	EDR	PH97107	1	0.7	70
4	MMNA	PH97108	0.95	0.505	53
5	AMP	PH97205	1.1	0.77	70
6	CP	PH97206	1.4	0.82	59
7	QM	PH97207	1.52	1.034	68
8	SSP	PH97208	2.05	1.44	70
9	NPP	PH97305	1.41	1.12	79
10	FOIO	PH97306	1.88	1.3	69
11	NST	PH97307	2	1.42	71
12	LASER	PH97308	1.75	1.4	80