

ANNEXURE 1

Course Folder -

1. List of all the documents in the Course Folder
2. Syllabus prescribed by the University.
3. Pre-requisites.
4. Course Objectives, Course Outcomes, Program Outcomes, Program Educational Objectives and Program Specific Objectives.
5. Curriculum (Theory and practical) with Augmentation (Use of Questionnaires to collect info from all stakeholders).
6. *Modes of delivery of the concepts / courses.*
7. Personal Time Table.
8. Lesson plan (Theory, Laboratory, Students, Slow learners and Fast learners).
9. List of prescribed text books from syllabus / Augmentation.
10. List of Reference books / Journals / Articles / URLs / Blogs / other sources.
11. Question bank.
12. Assignment bank.
13. Map of course outcome to assessment methodology.
14. Question Papers (along with their Scheme of valuation) – Theory and Practicals
15. Assessment methodologies and their scores (of all the students).
16. Classification of students (based on all the information).
17. Intervention for Slow / Fast learners.

Signature of Faculty

Signature of Principal

Syllabus prescribed by the University (To be given as is)

Lectures : 2 Hrs

Examination Time : 3 Hrs Maximum Marks: 50(20+30)

Subject: Elective paper (Optics – II)

Paper Code: PHY – 206 A

Note: Examiner will set nine questions and the students will be required to attempt five questions in all, Question number one is compulsory containing six short answer type's questions covering the entire syllabus and will be of 1 mark. Further examiner will be set two questions from each unit and the students will be required to attempt one question from each unit which will be of 6 marks each.

UNIT – I

Polarization: different states of polarization, double refraction (explanation from electromagnetic theory), Huygen's construction for uni – axial crystals, polaroid's and their uses, circularly and elliptically polarized light, Fresnel's explanation of optical activity, bi-quartz and half shade polarimeter

UNIT – II

Production and analysis of plane, circularly and elliptically polarised light by retardation plates and rotatory polarisation Fresnel's diffraction, Zone plate, diffraction due to straight edge, Fraunhofer diffraction due to single and double slits, plane transmission grating and its resolving power

UNIT – III

The principle of holography, modifications and applications, observing small object deformations, holographic optical instruments pattern recognition volume holograms

UNIT – IV

The electric dipole interaction, simple LASER theory, three level systems and atomic interference lasing without inversion, correlated emission LASER, motion of a two-level atom in a quantized light field

Books Recommended:

- 1. Fundamentals of Optics by Francis Arthur Jenkins and Harvey Elliott White**
- 2. Optics by Ajoy Ghatak**
- 3. Optics by Eugene Hecht and A. R. Ganesan**
- 4. Light and Optics: Principles and Practices by Abdul Al-Azzawi**
- 5. Contemporary Optics by Ajoy Ghatak and K. Thyagarajan**

Theory (provide the number of hours of teaching) 36

Course Prerequisites: Physics and Mathematics in 12th class

Course Objectives,

1. Creating an environment to make teaching more learning centric rather than curriculum centric.
2. To train students in basic science.
3. To develop industry institute interface for collaborative research, internship and fellowship for UG and PG Programme.
4. To focus undergraduate students on the application of established methods to the design and analyze of Scientific solutions for day to day problems in society.

Course Outcomes, (CO):

CO 1 : Analyze data, understand Concepts of gradient, Divergence and curl ;line, surface and volume integrals

CO 2 : Distinguish inertial, non-inertial and rotational frames of reference. Also able understand and distinguish real, fictitious and Coriolis force and its importance in real life.

CO 3 : Distinguish Galilean, Lorentz transformation and their applications .Understand special theory of relativity by studying variation of length, mass and time with relativistic velocity

CO 4 : Understanding Lorentz transformations, Length contraction, Time dilation, Simultaneity in relativity theory.

CO 5: Find Young's modulus, rigidity modulus and their importance in understanding materials and applications.

CO 6 : Understand concept of surface tension and viscosity of liquids and their experimental Determination, properties of fluids and fluid dynamics

Program Outcomes,

Programme Specific Outcome (PSO):

On completion of the 03/ 04 years Degree in PHYSICS students will be able to:

PSO 1 : Culminate in depth knowledge of almost all basic branches of physics such as mechanics, properties of matter, relativity, electricity and magnetism, wave motion, optics, thermal physics, electronics, classical mechanics, quantum mechanics, spectroscopy, nuclear physics, condensed

matter physics and also advanced areas like Nanoscience, energy science, astrophysics, instrumentation.

PSO 2 :Communicate effectively physics concepts with examples related to day to day life. Acquire ability of recognizing and distinguishing various aspects of physics found in real life.

PSO 3 : Learn, perform and design experiments in the laboratory to demonstrate the concepts principles, laws of physics, theories learnt in the class rooms.

PSO 4 : Acquire ability of critical thinking and logical reasoning in physics problems and their solutions

PSO 5 : Appreciate the importance of physics subjects and its application for pursuing interdisciplinary and multidisciplinary higher education and research in these areas.Pursue advanced studies and research in varied areas of physical science

PSO 6 Develop ability to apply the knowledge and skill acquired through experiments of physics in laboratories to solve real life problems

Program Educational Objectives

PEO 1. Develop ability to analyze physics problem including simple to thought provoking problems and apply the acquired knowledge to solve real life problems.

PEO 2 Appreciate the importance of physics subjects and its application for pursuing interdisciplinary and multidisciplinary higher education and research in these areas.

PEO 3 Understand the vast scope of physics as theoretical and experimental science with application in finding solution of problems in nature spanning from smallest dimension 10⁻¹⁵ m to highest dimension 10²⁶ m in space, covering energy ranges from 10⁻¹⁰ eV to 10²⁵ eV.

PEO 4 think independently and develop algorithm and program using programming techniques for solving real world physics problems.

PEO 5 develop ability of working independently and to make in-depth study of various notions of physics.

Program Specific Objectives

PSO1. Understanding and Exploration of various disciplines of Physics

PSO2. Focus and Immersion in the discipline and gaining perspective of context.

PSO3. In depth learning of major and minor disciplines, Skill sets for employability.

PSO4. Deeper and Advanced Learning of Major Discipline Foundation to pursue Doctoral Studies & Developing Research competencies

PSO5. Deeper and Advanced Learning of the Major Discipline towards gaining proficiency

LESSON PLAN THEORY

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology (code)	Teaching aids used (code)	Method of Assessment (code)	No. of Students assessed			Total Students Enrolled	Remarks
					Planned	Engaged				Correctly Responded	Not Responded correctly	Total Assessed		
1	Polarization:	1	1	1			a,b,c	I, IV	A,C,D	5	13	18	23	
	different states of polarization,	1	2	1			a,b,c	I, IV	A,C,D	6	14	20	23	
	double refraction (explanation from electromagnetic theory),	1	5	1			a,b,c	I, IV	A,C,D	4	16	20	23	
	Huygen's construction for uni – axial crystals,	1	6	1			c, b,d	III,I	A,C,D	5	12	17	23	
	polaroid's and their uses, ,	1	1	2			a,b,c	I, IV	A,C,D	5	14	19	23	
	circularly and elliptically polarized light,	1	3	3			a,b,c	I, IV	A,C,D	6	13	19	23	
	Fresnel's explanation of optical activity,	1	4	2			e,a,c	I,II	A,C,D	6	11	17	23	
	bi-quartz polarimeter	1	5	2			a,b,c	I, IV	A,C,D	5	13	18	23	
	and half shade polarimeter	1	2	2			a,b,c,e	I, IV,II	A,C,D	4	14	18	23	

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
	superposition theorem (statement only),	1	4	2			a,b,c,e	I, IV,II	A,C,D	5	14	19	23	
	application of Laplace's equation	1	5	2			a,b,c,e	I, IV,II	A,C,D	5	12	17	23	
	to simple cases of	1	6	2			d,e,b	I,II,III	A,C,D	5	11	16	23	
	symmetric spherical charge distribution	1	1	2			a,c,e	I, II	A,C,D	5	15	20	23	
	Problem solving	1	2	2			b,c	I	A,C,D	3	14	17	23	
	Problem solving	1	3	2			g,n,e	I,II ,IV	A,C,D	6	12	18	23	
2	Production and analysis of plane polarised light	1	6	6			a,b,c,e	I,II,VI	A,C,D	6	14	20	23	
	circularly polarised light	1	1	6			a,b,c,e	I,II,VI	A,C,D	7	9	16	23	
	and elliptically polarised light by retardation plates	1	4	6			a,b,c,e	I,II,VI	A,C,D	7	11	18	23	
	and rotatory polarisation	1	5	6			a,b,c,e	I,II,VI	A,C,D	3	16	19	23	
	Frenel's diffraction,	1	1	6			a,b,c,e	I,II,VI	A,C,D	4	15	19	23	
	Zone plate,	1	2	6			b,d,g	I,III,V	A,C,D	4	14	18	23	
	, diffraction due to straight edge	1	5	6			b,d,g	I,III,V	A,C,D	2	15	17	23	
	, Fraunhofer diffraction due to single	1	6	6			b,c	I,III	A,C,D	3	16	19	23	
	double slits,	1	1	6			b,c	I,III	A,C,D	3	15	18	23	

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
	plane transmission grating and its resolving power,	1	3	5			a,b,c	I,VI,V	A,C,D	8	9	17	23	
3	The principle of holography,	1	4	5			a,b,c	I,V,VI	A,C,G	8	8	16	23	
	modifications and applications,	1	5	5			a,b,c	I,V,VI	A,C,G	6	12	18	23	
	observing small object deformations,	1	2	5			a,b,c	I,V,VI	A,C,G	7	13	20	23	
	holographic optical instruments	1	4	5			a,b,c	I,V,VI	A,C,G	3	14	17	23	
	pattern recognition	1	5	5			a, b,e	I,II,V	A,C,G	3	14	17	23	
	volume holograms	1	6	5			a, b,e	I,II,V	A,C,G	2	14	16	23	
	Applications	1	1	5			a, b,e	I,II,V	A,C,G	0	15	15	23	
	Quiz.	1	2	5			b,c	I,II	A,C,G	5	12	17	23	
4	The electric dipole interaction,	1	3	3			a, b,e	I,II,V	A,C,G	4	14	18	23	
	simple LASER theory,	1	6	3			a, b,e	I,II,V	A,C,G	3	13	16	23	
	three level systems	1	1	4			a, b,e	I,II,V	A,C,G	3	15	18	23	
	and atomic interference	1	4	4			b,e	I,II	A,C,G	1	14	15	23	
	lasing without inversion,	1	5	4			b,e	I,II	A,C,G	1	16	17	23	

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
	correlated emission LASER,	1	2	4			b,c	I,V	A,C,G	4	16	20	23	
	motion of a two-level atom in a quantized light field	1	6	4			b,c	I,V	A,C,G	5	13	18	23	

Portions for Sessionals examination

I-Sessional Exam	II- Sessional Exam	III- Sessional Exam	Re-Sessional Exam
Unit – 1	NA	NA	NA
Unit – 2			

PRACTICAL

	Title & Contents of the chapter	After completion of the practical the student shall be able to	Skills and Competency Developed	Course Outcome
1.	To determine the height of terrestrial object using sextant.	Estimate the heights of distant objects scientifically	Analytical skills and error estimation	1

	Title & Contents of the chapter	After completion of the practical the student shall be able to	Skills and Competency Developed	Course Outcome
2.	Determination of Stefan's Constant.	Power radiated by a black body	Scientific temperament	2
3.	To study the variation of semiconductor resistance with temperature and hence to Determine the Band Gap of semiconductor in the form of reverse biased P-N junction.	Energy gap of semiconductors	Applications of semiconductors	3
4.	Moment of Inertia of a fly-wheel.	Moment of inertia of circular objects	Conservation of energy, working of turbines	4
5.	'g' by Bar pendulum.	Determine Acceleration due to gravity	SHM and its applications Scientific temperament	5
6.	M.I. of an irregular body using a torsion pendulum.	Role of stress and strain, SHM	Importance of MI	5

Portions for sessional examination

I- Sessional Exam	II- Sessional Exam	III- Sessional Exam	Re-Sessional Exam
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SCHOOL OF BASIC AND APPLIED SCIENCES

FACULTY NAME: Dr. N. RAKESH CHANDRA

ACADEMIC YEAR - 2021 – 2022

EVEN SEMESTER

TIME TABLE

DAY↓ /TIME→	9:30- 10:20	10:20- 11:10	11:10- 12:00	12:00- 12:50	12:50- 1:50	1:50- 2:40	2:40-3:30	3:30-4:20
MONDAY	PHY - 101	PHY - 201		PHY - 301	LUNCH	ENGG. PHYSICS	PHY - 107	PHY - 107
TUESDAY	PHY - 303	PHY - 203	PHY - 101			ENGG. PHY LAB	ENGG. PHY LAB	
WEDNESDAY	PHY - 105	PHY - 205A	PHY - 305B			ENGG. PHY LAB	ENGG. PHY LAB	
THURSDAY	PHY - 301	PHY - 201	PHY - 105			ENGG. PHYSICS	PHY - 207	PHY - 207
FRIDAY	PHY - 103	PHY - 203	PHY - 305B			ENGG. PHY LAB	ENGG. PHY LAB	
SATURDAY	PHY - 303	PHY - 205A	PHY - 103			ENGG. PHYSICS	PHY - 307	PHY - 307

Convener

Co-convener

HOD

Dean

Teaching Methodology	Code	% of Delivery
Lecturing	a	20%
Discussion	b	6%
Group discussion	c	5%
Demonstration	d	10%
Power point presentation	e	15%
Tutorial class	f	5%
Assignment	g	10%
Seminar	h	5%
Remedial class	i	10%
Project work	j	
Industrial visit	k	
Role play	l	8%
Quiz	m	4%
Mind mapping	n	2%
Others specify	o	

Modes of delivery of courses

Teaching Aids used	Code
Chalkboard	I
Power point	II
Videos	III
Posters	IV
Charts	V
Models	VI
Flash cards	VII
Others specify	VIII

Assessment Method	Code	% of Scheme of evaluation
Viva	A	10%
Synopsis	B	
Continuous assessment	C	5%
Unit test	D	20%
End Semester exam	E	60%
Prefinal exam	F	
Assignments	G	5%
Others specify	H	

List of prescribed text books from UniversitySyllabus

SI No	Title of the book	Author/s	Edition, Year of Publication	Publisher	No.of copies available in the library
1	Berkely Physics Course. Vol. 1. Mechanics	E.M.Purcell			Nil
2	Concepts of Modern Physics	Arthur Beiser			Nil
3	Properties of Matter	D.S. Mathur.			Nil
4	Engineering Physics	V. Rajendran			Nil
5	Mechanics (VI-Edition)	J. C. Upadhyay – Ramprasad & Sons	2005.	Agra	
6	Mechanics (XX-Edition) .	D. S. Mathur	2007	S. Chand & Company Ltd., New-Delhi	
7.	Mechanics & Electrodynamics (XVII-Edition, Course- 1 & 2)	Brijlal, Subramanyam & Jivan Seshan,	2008.	S. Chand & Company Ltd., New-Delhi	
8	Properties of Matter (XIII-Edition) –	Brijlal & Subramanyam,	2001.	Eurasia Publishing House Pvt. Ltd., New-Delhi	
9	Elements of Properties of Matter (XXVIII-6.	D. S. Mathur	Edition - 2005.	S. Chand & Company Ltd., NewDelhi,	

10	Physics, Vol. No. I (V-Edition)	Resnick, Halliday & Krane	2005.	John Wiley & Sons Inc., New-York,	
11	Berkeley Physics, Vol. No. I –			ABC Publications, Bangalore & New-Delhi.	
12	University Physics (XI-Edition)	Young & Freedman	2004.	Pearson Education,	
13	Introduction to Relativity-	R. Resnik			
14	. Relativistic Mechanics-	Gupta and Kumar.			

List of Reference text books from University Syllabus

Sl No	Title of the book	Author/s	Edition, Year of Publication	Publisher	No. of copies available in the library
1	Engineering Physics by	MN Avadhanulu, PG Ksheersagar			Nil
2	Fundamental laws of Mechanics	Igor Irodov			Nil
3	Vectors, Tensors, and the Basic Equations of Fluid Mechanics	Rutherford Aris.			Nil
4	An Introduction to Mechanics Book	Daniel Kleppner and Robert J. Kolenkow.			Nil

List of URLs / Blogs / Other e-Sources

1. <https://www.youtube.com/watch?v=PMpoamNGceM>
2. https://www.youtube.com/watch?v=PMpoamNGceM&list=RDLVPMpoamNGceM&start_radio=1&rv=PMpoamNGceM&t=52
3. <https://www.youtube.com/watch?v=zl3Uj18eHek&list=RDLVPMpoamNGceM&index=11>
4. <https://www.youtube.com/watch?v=bow4rwrT-k>
5. <https://www.youtube.com/watch?v=etjZmdmrjSU>
6. https://onlinecourses.nptel.ac.in/noc19_mm16/preview

Module / Chapter No 1

SI No	Question	Max Marks	Related course outcome
1	State and explain Gradient, Divergence and Curl.	5	1
2	Define Frame of Reference. Differentiate between inertial and non inertial frames of reference.	5	1
3	Discuss two Centrifugal force and Coriolis force.	5	2
4	Differentiate between conservative and non conservative forces.	5	2
5	Discuss Kepler's laws of motion.	5	3

Module / Chapter No 2

SI No	Question	Max Marks	Related course outcome
1	Discuss briefly the properties of Ideal fluids	5	6
2	Derive an expression for Euler's equation of Motion.	5	6

3	State Bernoulli's theorem and derive an expression for it.	5	6
4	Define Viscosity and determine Viscosity by rotating cylinder method.	5	6
5	Write a short note on Poiseuille's equation.	5	6

Module / Chapter No 3

SI No	Question	Max Marks	Related course outcome
1	1. Define Stress and Strain and elasticity.	5	5
2	State and explain Hooke's law.	5	5
3	. Derive relationship between Young's modulus and Bulk modulus.	5	5
4	Derive relationship between Young's modulus and Bulk modulus and rigidity modulus.	5	5
5	Derive an expression for Internal energy of a strained body.	5	5

Module / Chapter No 4

SI No	Question	Max Marks	Related course outcome
1	Write the inferences of Michelson Morley experiment.	5	3
2	Write the Postulates of special relativity.	5	4
3	Derive Mass-Energy relation.	5	4
4	Write a short note on Lorentz transformations.	5	4
5	Write a short note on Length contraction, Time dilation	5	4

Module / Chapter No 1

SI No	Assignment	Max Marks	Related course outcome
1	explain Gradient, Divergence and Curl. Discuss its importance	5	1
2	Relate inertial and non inertial frames of references in day to day life	5	1
3	Discuss Centrifugal force and Coriolis force.	5	2
4	List and explain conservative and non conservative forces.	5	2
5	Discuss Kepler's laws of motion.	5	3

Module / Chapter No 2

SI No	Assignment	Max Marks	Related course outcome
1	Discuss characteristics of Ideal fluids	5	6
2	Explain the need of a vertical pipe established in parallel to the water tank	5	6

3	State Bernoulli's theorem and derive an expression for it.	5	6
4	Define Viscosity give its significance	5	6
5	Write a short note on Poiseuille's equation. Where do you apply Bernoulli's theorem	5	6

Module / Chapter No 3

SI No	Assignment	Max Marks	Related course outcome
1	Is elasticity needed for materials? Justify	5	5
2	State and explain Hooke's law.	5	5
3	What is the role of steel in buildings constructions?	5	5
4	Derive relationship between Young's modulus and Bulk modulus and rigidity modulus.	5	5
5	Explain the need of shock absorbers for vehicles	5	5

Module / Chapter No 4

SI No	Assignment	Max Marks	Related course outcome
1	Write the Significance of Michelson Morley experiment.	5	3
2	Write the Postulates of special relativity. Why are they needed? Justify	5	4
3	Derive Mass-Energy relation.	5	4
4	Explain the need of Lorentz transformations.	5	4

5	Write a short note on Length contraction, Time dilation. Justify	5	4
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**RAFFLES UNIVERSITY, NEEMRANA
SCHOOL OF BASIC AND APPLIED SCIENCES
MIDTERM EXAMINATIONS (PCM & PCsM)**

SEMESTER – I

YEAR - I

SUB: MECHANICS

SUB CODE: PHY – 101 DATE:16 – 11 – 2022

TIMINGS: 10:00 – 11:00 HRS

MAX MARKS: 10 NOTE: ANSWER ANY FOUR OF THE FOLLOWING

2.5 X 4 = 10 M

1. Show that the vector $2x^2 \mathbf{i} - 4xy \mathbf{j} + 3xz^2 \mathbf{k}$ is irrotational at $(1, -2, -1)$.
2. Differentiate between inertial and non-inertial frames of reference.
3. Write a brief note on Coriolis force.
4. What are the properties of ideal fluids?
5. State and Derive Bernoulli's theorem.

S.No	Classification	Name of the students
	Slow learners (less than 50 %)	
	Remedial teaching Questions for practice Special guidance beyond college hour Trace out physical and mental problems if any Encourage even for small achievement Giving memory tip Review time to time	ARVIND YADAV BABRI BHAN SINGH YADAV BITTU SAINI DEEPAK NITIN KUMAR PURSHOTAM JANGIR RAHUL YADAV SHIVAM SINGH YADAV YUVRAG SINGH ANMOL YADAV VIJAY RAJPUT

S.No	Classification	Name of the students
	Fast learners (Above 76 %)	
	Actions taken	
1 2	Solve Engineering Problems Study beyond the syllabus	Kanika, Prashanth, Simran, Shubham, Shivani, Vinay, Preethi,

S.No	Classification	Name of the students
	Average learners (51-75 %)	
	Actions taken	
1 2 3 4	Motivate students Audio-visual aids Create confidence level in their interest areas Mind map	Neha, Mayank, Manjeet, Pankaj, Paras, Ashish

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
	different states of polarization,	1	2	1			a,b,c,d	I,III, IV	A,C,D	5	4	9	12	
	double refraction (explanation from electromagnetic theory),		5	1										
	Huygen's construction for uni – axial crystals,		6	1										
	polaroid's and their uses,	1	1	2			a,b,c,e	I, IV,II	A,C,D	4	7	11	12	
	, circularly and elliptically polarized light,		3	3										
	Fresnel's explanation of optical activity,		4	2										
	bi-quartz polarimeter		5	2										
	and half shade polarimeter		2	2										
	superposition theorem (statement only),		5	2										
	application of Laplace's equation	1	6	2										
	to simple cases of		1	2										
	symmetric spherical charge distribution		2	2			a,b,c,d,g,n, e	I,II ,III, IV	A,C,D	4	6	10	12	
	Problem solving		3	2										
2	Problem solving	1	6	6			a,b,c,e	I,II,VI	A,C,D	2	8	10	12	

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
	Production and analysis of plane polarised light		1	6										
	circularly polarised light		4	6										
	and elliptically polarised light by retardation plates	1	5	6			a,b,c,d,g,e	I,II,III, V, VI	A,C,D	3	8	11	12	
	and rotatory polarisation		1	6										
	Frenel's diffraction,		2	6										
	Zone plate,		5	6										
	, diffraction due to straight edge	1	6	6			a,b,c	I,III,IV, V	A,C,D	3	7	10	12	
	, Fraunhofer diffraction due to single		1	6										
	double slits,		3	5										
	3	plane transmission grating and its resolving power,	1	4	5			a,b,c	I,V,VI	A,C,G	2	7	9	12
The principle of holography,		5		5										
modifications and applications,		2		5										
observing small object deformations,			4	5										
holographic optical instruments		5	5											

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
	pattern recognition	1	6	5			a,b,c,e	I,II,V VI	A,C,G	3	7	10		
	volume holograms		1	5										
	Applications		2	5										
4	Quiz.	1	3	3			a, b,e	I,II,V, IV	A,C,G	3	8	11	12	
	The electric dipole interaction,		6	3										
	simple LASER theory,		1	4										
	three level systems		4	4										
	and atomic interference	1	5	4			b,e,c	I,II,V	A,C,G	3	6	9	12	
	lasing without inversion,		2	4										
	correlated emission LASER,		6	4										

LESSON PLAN THEORY (AVERAGE LEARNERS)

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
	symmetric spherical charge distribution		2	2			a,b,c,d,g,n,e	I,II,III,IV	A,C,D					
	Problem solving		3	2										
2	Problem solving	1	6	6			a,b,c,e	I,II,VI	A,C,D	3	3	6	8	
	Production and analysis of plane polarised light		1	6										
	circularly polarised light		4	6										
	and elliptically polarised light by retardation plates	1	5	6			a,b,c,d,g,e	I,II,III,V,VI	A,C,D	4	3	7	8	
	and rotatory polarisation		1	6										
	Frenel's diffraction,		2	6										
	Zone plate,		5	6										
	, diffraction due to straight edge	1	6	6			a,b,c	I,III,IV,V	A,C,D	3	4	7	8	
	, Fraunhofer diffraction due to single		1	6										
	double slits,		3	5										
3	plane transmission grating and its resolving power,	1	4	5			a,b,c	I,V,VI	A,C,G	2	6	8	8	
	The principle of holography,		5	5										

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
	modifications and applications,	1	2	5			a,b,c,e	I,II,V VI	A,C,G	3	4	7	8	
	observing small object deformations,		4	5										
	holographic optical instruments		5	5										
	pattern recognition		6	5										
	volume holograms		1	5										
	Applications		2	5										
4	Quiz.	1	3	3			a, b,e	I,II,V, IV	A,C,G	3	3	6	8	
	The electric dipole interaction,		6	3										
	simple LASER theory,		1	4										
	three level systems		4	4										
	and atomic interference	1	5	4			b,e,c	I,II,V	A,C,G	3	4	7	8	
	lasing without inversion,		2	4										
	correlated emission LASER,		6	4										

LESSON PLAN THEORY (FAST LEARNERS)

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology (code)	Teaching aids used (code)	Method of Assessment (code)	No. of Students assessed			Total Students	Remarks
					Planned	Engaged				Correctly Responded	Not Responded correctly	Total Assessed		
												5		
1	Polarization:	1	1	1			a,b,c,d	I,III, IV	A,C,D	3	2	5	5	
	different states of polarization,		2	1										
	double refraction (explanation from electromagnetic theory),		5	1										
	Huygen's construction for uni – axial crystals,		6	1										
	polaroid's and their uses,	1	1	2			a,b,c,e	I, IV,II	A,C,D	2	2	4	5	
	circularly and elliptically polarized light,		3	3										
	Fresnel's explanation of optical activity,		4	2										
	bi-quartz polarimeter		5	2										
	and half shade polarimeter		2	2										
	superposition theorem (statement only),	5	2											
	application of Laplace's equation	1	6	2										
to simple cases of	1		2											

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
										2	3	5		
	symmetric spherical charge distribution		2	2			a,b,c,d,g,n,e	I,II,III,IV	A,C,D	2	3	5	5	
	Problem solving		3	2										
2	Problem solving	1	6	6			a,b,c,e	I,II,VI	A,C,D	2	3	5	5	
	Production and analysis of plane polarised light		1	6										
	circularly polarised light		4	6										
	and elliptically polarised light by retardation plates	1	5	6			a,b,c,d,g,e	I,II,III,V,VI	A,C,D	3	2	5	5	
	and rotatory polarisation		1	6										
	Frenel's diffraction,		2	6										
	Zone plate,		5	6										
	, diffraction due to straight edge	1	6	6			a,b,c	I,III,IV,V	A,C,D	2	2	4	5	
	, Fraunhofer diffraction due to single		1	6										
	double slits,		3	5										
3	plane transmission grating and its resolving power,	1	4	5			a,b,c	I,V,VI	A,C,G	2	3	5	5	
	The principle of holography,		5	5										

Unit No.	Title & Contents of the chapter	Number of Hours	PO	CO	Date		Methodology	Teaching aids used	Method of Assessment	No. of Students assessed			Total Students	Remarks
	modifications and applications,	1	2	5			a,b,c,e	I,II,V VI	A,C,G	3	1	4	5	
	observing small object deformations,		4	5										
	holographic optical instruments		5	5										
	pattern recognition		6	5										
	volume holograms		1	5										
	Applications		2	5										
4	Quiz.	1	3	3			a, b,e	I,II,V IV	A,C,G	3	2	5	5	
	The electric dipole interaction,		6	3										
	simple LASER theory,		1	4										
	three level systems		4	4										
	and atomic interference	1	5	4			b,e,c	I,II,V	A,C,G	3	2	5	5	
	lasing without inversion,		2	4										
	correlated emission LASER,		6	4										

Feedback on Curriculum

Formats have been developed for the following stakeholders

1. Present / Current students
2. Students just passing out (Exit Interview)
3. Alumni
4. Parents
5. Industry based supervisors
6. Placement (campus recruiters)
7. Departmental Advisory Board