

Page - 2
ECE - T

ST. ANNE'S COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
ANGUCHETTYPALAYAM, PANRUTI - 607 106.



ATTENDANCE AND ASSESSMENT RECORD

Name of the Staff : K. RAKESH JAWAHAR
Department of the Staff : SEH
Semester / Subject : 3 / ENGINEERING PHYSICS
Period : SEP - FEB (2023-24)



ST. ANNE'S COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi. Affiliated to Anna University, Chennai)

Accredited by NAAC

ANGUCHETTPALAYAM, PANRUTI - 607 106.

PH3151

ENGINEERING PHYSICS

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To make the students effectively achieve an understanding of mechanics.
- To enable the students to gain knowledge of electromagnetic waves and its applications.
- To introduce the basics of oscillations, optics and lasers.
- Equipping the students to successfully understand the importance of quantum physics.
- To motivate the students towards the applications of quantum mechanics.

UNIT I MECHANICS

Multi-particle dynamics: Center of mass (CM) - CM of continuous bodies - motion of the CM - kinetic energy of the system of particles. Rotation of rigid bodies: Rotational kinematics - rotational kinetic energy and moment of inertia - theorems of M.I - moment of inertia of continuous bodies -

M.I of a diatomic molecule - torque - rotational dynamics of rigid bodies - conservation of angular momentum - rotational energy state of a rigid diatomic molecule - gyroscope - torsional pendulum - double pendulum - Introduction to nonlinear oscillations.

UNIT II ELECTROMAGNETIC WAVES

The Maxwell's equations - wave equation; Plane electromagnetic waves in vacuum, Conditions on the wave field - properties of electromagnetic waves: speed, amplitude, phase, orientation and waves in matter - polarization - Producing electromagnetic waves - Energy and momentum in EM waves: Intensity, waves from localized sources, momentum and radiation pressure - Cell-phone reception. Reflection and transmission of electromagnetic waves from a non-conducting medium- vacuum interface for normal incidence.

UNIT III OSCILLATIONS, OPTICS AND LASERS

Simple harmonic motion - resonance - analogy between electrical and mechanical oscillating systems - waves on a string - standing waves - traveling waves - Energy transfer of a wave - sound waves - Doppler effect. Reflection and refraction of light waves - total internal reflection - interference - Michelson interferometer - Theory of air wedge and experiment. Theory of laser - characteristics

- Spontaneous and stimulated emission - Einstein's coefficients - population inversion - Nd-YAG laser, CO2 laser, semiconductor laser - Basic applications of lasers in industry.

UNIT IV BASIC QUANTUM MECHANICS

Photons and light waves - Electrons and matter waves - Compton effect - The Schrodinger equation (Time dependent and time independent forms) - meaning of wave function - Normalization - Free particle - particle in a infinite potential well: 1D, 2D and 3D Boxes- Normalization, probabilities and the correspondence principle.

UNIT V APPLIED QUANTUM MECHANICS

The harmonic oscillator (qualitative) - Barrier penetration and quantum tunneling (qualitative) - Tunneling microscope - Resonant diode - Finite potential wells (qualitative) - Bloch's theorem for particles in a periodic potential - Basics of Kronig-Penney model and origin of energy bands.

TOTAL : 45 PERIODS

TEXT BOOKS:

- D.Kleppner and R.Kolenkow. An Introduction to Mechanics. McGraw Hill Education (Indian Edition), 2017.
- E.M.Purcell and D.J.Morin, Electricity and Magnetism, Cambridge Univ.Press, 2013.
- Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, Concepts of Modern Physics, McGraw-Hill (Indian Edition), 2017.

REFERENCES:

- R.Wolfson. Essential University Physics. Volume 1 & 2. Pearson Education (Indian Edition), 2009.
- Paul A. Tipler, Physic - Volume 1 & 2, CBS, (Indian Edition), 2004.
- K.Thyagarajan and A.Ghatak. Lasers: Fundamentals and Applications, Laxmi Publications, (Indian Edition), 2019.
- D.Halliday, R.Resnick and J.Walker. Principles of Physics, Wiley (Indian Edition), 2015.
- N.Garcia, A.Damask and S.Schwarz. Physics for Computer Science Students. Springer-Verlag, 2012.

Name of the Staff : K. RAKESH JAWAHER

Department of the Staff : S & H

Department of the Student : FCE

Semester : I

Subject Code & Name : PH3151 - ENGINEERING PHYSICS

Period From : SEP to FEB (23-24)

To be Signed at the end of the each Assessment

Assessment Report	CIA - I	CIA - II	
Assessment Date	24.11.23	02.01.24	
Report Due on	25.11.23	03.01.24	
Signature - HoD of Students with Date	S. J. P.	S. J. P.	

To be Signed at the end of the Semester

Staff in - charge	HoD of Staff	HOD of Students	Principal
K. Rakesh	S. J. P.	S. J. P.	A. Jeyaraj

ATTENDANCE

S No.	Reg. No.	Name
21.	6021	Mano Preeti
22.	6022	Mohamed K
23.	6023	Mohanbani
24.	6024	Prasanth
25.	6025	Praveena
26.	6026	Praveenku
27.	6027	Rabinraj
28.	6028	Rohan Raj
29.	6029	Sangeetha
30.	6030	Santhana I
31.	6031	Senthamizhs
32.	6032	Sibi
33.	6033	Sivaranjan
34.	6034	Sivranjani
35.	6035	Surendira
36.	6036	Sweetly P
37.	6037	Vartika
38.	6038	Vimalraj
39.	6039	Vishwa
No. of Absentees		
Initial		

Attendance		
1	2	3
26	22	
23	20	
24	22	
25	20	
24	22	
24	22	
22	21	
24	22	
24	21	
24	21	
23	21	
23	22	
22	20	
24	22	
29	22	
26	22	
24	21	
24	21	

Assessment

Internal Component										Assessment	
Report -1 (R2021)					Report -2 (R2021)					CIA-1	CIA-2
Assignment	Case study	Seminar	Mini Project	Total (40)	Assignment	Case study	Seminar	Mini Project	Total (40)		
40				40	40				40	99	96
40				40	40				40	96	78
40				40	40				40	98	80
40				40	40				40	99	98
40				40	40				40	80	82
40				40	40				40	84	84
40				40	40				40	76	84
40				40	40				40	84	94
40				40	40				40	99	86
40				40	40				40	86	100
40				40	40				40	94	100
40				40	40				40	74	80
40				40	40				40	100	86
40				40	40				40	100	94
40				40	40				40	96	80
40				40	40				40	99	86
40				40	40				40	98	94
40				40	40				40	94	86
40				40	40				40	98	84

RECORD OF

S. No.	Class Planned		Topic Name	BT
	Date	Period		
1	25/09/23	7	Centre of Mass	K ₁
2	26/09/23	5	Motion of C.M - K.E - particle	K ₁
3	03/10/23	5	Rotational Kinematics	K ₂
4	05/10/23	1	Moment of Inertia - Theorem	K ₁
5	06/10/23	2	M.I of diatomic Molecule	K ₃
6	07/10/23	7	Conservation of Angular Momentum	K ₂
7	09/10/23	7	Rotational Energy state	K ₂
8	10/10/23	5	Torsional, double pendulum	K ₃
9	12/10/23	1	Gyroscope	K ₂
10	13/10/23	2	SHM - Resonance - Analog	K ₁
11	14/10/23	2	cell phone Reception	K ₂
12	16/10/23	7	Doppler Effect	K ₂
13	17/10/23	5	Michelson Interferometer	K ₃
14	19/10/23	1	Air wedge - Theory	K ₃
15	20/10/23	2	Einstein A & B coefficients	K ₃
16	21/10/23	5	Nd-YAG laser	K ₃
17	23/10/23	1	CO ₂ laser	K ₃
18	30/10/23	2	Semi-conductor laser	K ₃

CLASS WORK

Book Referred	Class Conducted		Reason for Deviation	TA	Staff Sign
	Date	Period			
T ₁	25/09/23	7		BB	K. Pr.
T ₁	26/09/23	5		BB	K. Pr.
T ₁	03/10/23	5		BB	K. Pr.
T ₁	05/10/23	1		BB	K. Pr.
T ₁	06/10/23	2		PPT	K. Pr.
T ₁	07/10/23	7		BB	K. Pr.
T ₁	09/10/23	7		PPT	K. Pr.
T ₁	10/10/23	5		PPT	K. Pr.
T ₁	12/10/23	1		PPT	K. Pr.
T ₁	13/10/23	2		PPT	K. Pr.
T ₁	14/10/23	2		PPT	K. Pr.
T ₁	16/10/23	7		BB	K. Pr.
T ₁	17/10/23	5		PPT	K. Pr.
T ₁	19/10/23	1		BB	K. Pr.
T ₁	20/10/23	2		BB	K. Pr.
T ₁	21/10/23	5		PPT	K. Pr.
T ₁	23/10/23	1		PPT	K. Pr.
T ₁	30/10/23	2		PPT	K. Pr.

* BT- Bloom's Taxonomy, TA-Teaching Aids

RECORD OF

S. No.	Class Planned		Topic Name	BT
	Date	Period		
19	31/10/23	7	Harmonic oscillator	K ₁
20	02/11/23	5	Barrier penetration	K ₂
21	04/11/23	1	Quantum Tunneling	K ₃
22	05/11/23	1	Scanning Tunneling Microscope	K ₃
23	06/11/23	7	Resonant diode	K ₂
24	09/11/23	5	Finite potential well	K ₃
25	10/11/23	1	Bloch's theorem	K ₃
26	16/11/23	2	Kronig-penny Model	K ₂
27	17/11/23	1	origin of Energy Bands	K ₁
28	18/11/23	2	Maxwell Equation - Integral	K ₂
29	20/11/23	1	Maxwell equation - Differential	K ₂
30	21/11/23	7	plane Electromagnetic Wave - vacuum	K ₃
31	24/11/23	5	plane Electromagnetic Wave - Dielectric	K ₃
32	27/11/23	2	properties of Electro-Magnetic Wave	K ₁
33	28/11/23	7	Sources of Electro-Mag wave	K ₁
34	30/11/23	5	Reflection & Transmission - Conducting	K ₃
35	01/12/23	1	Reflection & Transmission - Non-conducting	K ₃
36	02/12/23	2	polarization	K ₁

CLASS WORK

Book Referred	Class Conducted		Reason for Deviation	TA	Staff Sign
	Date	Period			
T ₁	31/10/23	7		BB	K.Gr
T ₁	02/11/23	5		BB	K.Gr
T ₁	04/11/23	1		BB	K.Gr
T ₁	05/11/23	1		PPT	K.Gr
T ₁	06/11/23	7		PPT	K.Gr
T ₁	09/11/23	5		BB	K.Gr
T ₁	10/11/23	1		BB	K.Gr
T ₁	16/11/23	2		BB	K.Gr
T ₁	17/11/23	1		BB	K.Gr
T ₁	18/11/23	2		BB	K.Gr
T ₁	20/11/23	1		BB	K.Gr
T ₁	21/11/23	7		BB	K.Gr
T ₁	24/11/23	5		BB	K.Gr
T ₁	27/11/23	2		BB	K.Gr
T ₁	28/11/23	7		BB	K.Gr
T ₁	30/11/23	5		BB	K.Gr
T ₁	01/12/23	1		BB	K.Gr
T ₁	02/12/23	2		PPT	K.Gr

* BT- Bloom's Taxonomy, TA-Teaching Aids

Time Table

PERIOD DAY	1	2	3	4	5	6	7	8
Monday							PH3151	
Tuesday				PH3151				
Wednesday								
Thursday	PH3151							
Friday		PH3151						

Unit Completion Details

Unit No.	Unit Description	Start Date	Finish Date	No. of Hours
1	UNIT - I	25/09/23	12/10/23	9
2	UNIT - II	13/10/23	30/10/23	9
3	UNIT - III	31/10/23	17/11/23	9
4	UNIT - IV	18/11/23	02/12/23	9
5	UNIT - V	04/12/23	19/12/23	9

S. Bay
Subject In-Charge

S. d. P.
HoD of Students

R. S. S.
Principal



ST. ANNE'S COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi. Affiliated to Anna University, Chennai)

Accredited by NAAC
ANGUCHETTYPALAYAM, PANRUTI - 607 106.

COURSE OUTCOMES:

CO. No	COURSE OUTCOMES	Knowledge level
CO1	Understand the importance of mechanics.	K2
CO2	Express their knowledge in electromagnetic waves.	K2
CO3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers.	K2
CO4	Understand the importance of quantum physics.	K2
CO5	Comprehend and apply quantum mechanical principles towards the formation of energy bands	K2

BLOOM'S TAXONOMY: K-Level [K1-Remember, K2-Understand, K3- Apply, K4-Analyze, K5-Evaluate, K6-create]

CO's-PO's & PSO's MAPPING

PROGRAM OUTCOME	COURSE OUTCOME				
	1	2	3	4	5
PO	3	3	3	3	3
PO2	3	3	3	3	3
PO3	2	2	2	1	1
PO4	1	1	2	1	1
PO5	1	2	2	2	2
PO6	1	1	1	1	1
PO7	-	-	-	-	-
PO8	-	-	-	-	-
PO9	-	-	-	-	-
PO10	-	-	-	-	-
PO11	-	-	-	-	-
PO12	-	-	1	-	-
PSO1	-	-	-	-	-
PSO2	-	-	-	-	-
PSO3	-	-	-	-	-

Regulation 2021: 1 - low, 2 - medium, 3 - high, '-' - no correlation

Teaching Aids:

T1 - Textbook
OHP - Overhead Projector
L1 - Lecture

R1 - Reference Book
A - Animations
T - Tutorial

BB - Black Board
M - Models and Demo
A1 - Assignment

PPT - Power Point
V - Video Lecture