Department of Physics

Pavanatma College, Murickassery

Idukki-685604

Curriculum Framework

Academic Year 2018 – 2019

Table of Contents

Course – I Semester – I

Methodology And Perspectives Of Physics

1.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH1CRT01
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	36
9	Hours per Week	2
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

1.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Concepts and Development Physics	Chalk and talk, ICT	8
2	Number systems-Introductory Vector Analysis-Coordinate systems	Chalk and talk	18
3	Experimental methods and error analysis	Chalk and talk	10

1.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

1.4 Course Outcome

CO-1	Able to understand the developments in physics through centuries and its methodology.
CO-2	Able to understand different number systems, co-ordinate systems and their applications
CO-3	To understand various experimental methods to measure physical quantities and to estimate errors in measurement.

1.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	2	0	0	0	0	1	0	0	0
CO-2	3	0	0	0	0	0	0	0	0	0
CO-3	3	0	0	2	0	0	0	0	0	0

1.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	2	0	0	0	0	0
CO-2	2	0	1	0	0	0
CO-3	2	1	0	0	1	2

Course – II Semester – II

Mechanics And Properties Of Matter

2.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH2CRT02
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	36
9	Hours per Week	2
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 ($2 \times 4 = 8$)

2.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Wave motion-Oscillations	Chalk and talk	12
2	Rotational mechanics	Chalk and talk	7
3	Elasticity-Hydrodynamics	Chalk and talk	17

2.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

2.4 Course Outcome

CO-1	Able to understand the mathematical formulation of wave and oscillatory motions
CO-2	Able to understand the mathematical formulation of rotational motion
CO-3	Able to understand the concepts of mechanical properties of solids and fluids

2.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	0	0	2	0	0	0	0	0	1
CO-2	3	0	0	2	0	0	0	0	0	1
CO-3	3	0	0	2	0	0	0	0	0	1

2.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	1	2	1	1	2
CO-2	3	1	2	0	1	2
CO-3	3	1	2	0	1	2

Course – III Semester – III

Optics, Laser And Fiber Optics

3.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH3CRT03
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

3.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Interference	Chalk and talk, ICT	13
2	Diffraction- Polarization	Chalk and talk ,ICT	22
3	Laser- Fiber Optics	Chalk and talk	19

3.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

3.4 Course Outcome

CO-1	Able to understand the mathematical formulation and experimental aspects of interference of light
CO-2	Able to understand the mathematical formulation and experimental aspects of diffraction and polarization of light
CO-3	Able to understand the mathematical formulation and technological aspects of laser and fiber optics

3.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	0	0	2	0	0	0	0	0	0
CO-2	3	0	0	2	0	0	0	0	0	0
CO-3	3	0	0	2	0	0	0	0	0	2

3.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	1	2	0	2	2
CO-2	3	1	2	0	2	2
CO-3	3	1	2	1	2	2

Course – IV Semester – IV

Semiconductor Physics

4.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH4CRT04
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

4.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Semiconducting diodes and applications	Chalk and talk, ICT	14
2	Transistors Configurations and Feed back- Amplifiers and Oscillators	Chalk and talk, ICT	24
3	FET, Operational Amplifier and Modulation	Chalk and talk, ICT	16

4.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

4.4 Course Outcome

CO-1	Able to understand basic concepts of electronics
CO-2	Able to understand transistors and its applications
CO-3	Able to understand integrated circuits and its applications

4.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	1	0	2	0	0	0	0	0	2
CO-2	3	1	0	2	0	0	0	0	0	2
CO-3	3	1	0	2	0	0	0	0	0	2

4.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	1	1	3	1	1
CO-2	3	1	1	3	1	1
CO-3	3	1	1	3	1	1

Course – V Semester – V

Electricity And Electrodynamics

5.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH5CRT05
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	4
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

5.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Alternating Current and Network Theorems	Chalk and talk	15
2	Transient Current and Thermo electricity	Chalk and talk	8
3	Electrostatics and Magnetostatics	Chalk and talk	20
4	Maxwell's Equations and Electromagnetic wave propagation	Chalk and talk	11

5.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

5.4 Course Outcome

CO-1	Able to analyse electrical networks and circuits
CO-2	Able to understand transient currents and thermoelectric effects
CO-3	Basic understanding of electrodynamics. Able to understand the mathematical formalism of e.m wave propagation

5.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	1	0	2	0	0	0	0	0	2
CO-2	3	1	0	2	0	0	0	0	0	2
CO-3	3	1	0	2	0	0	0	0	0	2

5.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	1	1	3	1	3
CO-2	3	1	1	3	1	3
CO-3	3	1	1	3	1	1

Course – VI Semester – V

Classical And Quantum Mechanics

6.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH5CRT06
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

6.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Lagrangian and Hamiltonian Formulations of Classical Mechanics	Chalk and talk	15
2	Historical development and origin of quantum theory- General Formalism of Quantum Mechanics	Chalk and talk	24
3	Schrodinger equation and its applications	Chalk and talk	15

6.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

6.4 Course Outcome

CO-1	Able to understand potential formulation
CO-2	Able to understand the development and origin of q.m
CO-3	To understand schrodinger equation and its applications

6.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	1	0	2	0	0	0	0	0	1
CO-2	3	1	0	2	0	0	0	0	0	1
CO-3	3	1	0	2	0	0	0	0	0	1

6.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	1	3	3	1	1
CO-2	3	2	3	3	1	0
CO-3	3	2	3	3	1	0

Course – VII Semester – V

Digital Electronics And Programming

7.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH5CRT07
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

7.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Boolean algebra and logic gates	Chalk and talk	9
2	Combinational logic- Sequential logic	Chalk and talk	19
3	Programming in C++	Chalk and talk	26

7.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

7.4 Course Outcome

CO-1	Identify logic gates and perform operations of boolean algebra
CO-2	Analyse combinational logic circuits and sequential logic circuits
CO-3	Analyse c++ program structure and create simple c++ programs

7.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	0	0	0	0	2	0	0	2
CO-2	3	3	0	0	0	0	2	0	0	2
CO-3	3	3	0	3	0	1	2	0	2	2

7.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	0	3	3	1	0
CO-2	3	0	3	3	1	0
CO-3	0	0	3	3	1	0

Course – VIII Semester – V

Environmental Physics And Human Rights

8.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH5CRT08
4	Credit	4
5	Duration of External Examination	3 hours
6	External Assessment	80
7	Internal Assessment	20
8	Total hours	72
9	Hours per Week	4
10	Number of Modules	5
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	5
13	Assessment Test	10 (2 × 5 = 10)

8.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Water Resources and Its Management- Remote sensing- Environmental Pollution	Chalk and talk	15
2	Waste Management- Environment Impact Assessment and Control	Chalk and talk, ICT	12
3	Non-renewable and Renewable Energy Sources	Chalk and talk, ICT	13
4	Solar energy	Chalk and talk, ICT	14
5	Human Rights- - Human Rights and United Nations- Human Rights National Perspective	Chalk and talk, ICT	18

8.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

8.4 Course Outcome

CO-1	To understand the importance of water resource and its management, and environmental pollution
CO-2	To understand the importance of waste management , environmental impact , non-renewable and renewable energy resources and solar energy
CO-3	To understand the importance of water resource and its managemet, and environmental pollution. To understand the importance of waste management and environmental impact assessment ,human right issues

8.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	0	2	0	0	0	0	0	1	0	1
CO-2	0	2	0	0	0	0	0	1	0	1
CO-3	0	2	0	0	0	0	0	1	0	1

8.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	0	1	0	0	0
CO-2	0	0	0	0	0	0
CO-3	1	0	0	0	0	0

Course – IX Semester – V

Our Universe

9.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH5OPT01
4	Credit	4
5	Duration of External Examination	3 hours
6	External Assessment	80
7	Internal Assessment	20
8	Total hours	72
9	Hours per Week	4
10	Number of Modules	4
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	5
13	Assessment Test	10 (2 × 5 = 10)

9.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Our universe	Chalk and talk, ICT	10
2	Cosmology	Chalk and talk, ICT	14
3	Observational Astronomy	Chalk and talk, ICT	24
4	Solar system	Chalk and talk, ICT	24

9.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

9.4 Course Outcome

CO-1	To understand the structure of universe and galaxies
CO-2	To understand the evolution of universe and stars
CO-3	To understand the techniques and terms involved with astronomy, to understand the structure of solar system

9.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	0	3	0	0	0	0	3	0	0	0
CO-2	0	3	0	0	0	0	3	0	0	0
CO-3	0	3	0	0	0	0	3	0	0	0

9.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	0	0	2	0	1
CO-2	0	0	0	2	0	2
CO-3	0	0	0	2	0	1

Course – X Semester – VI

Thermal And Statistical Physics

10.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH6CRT09
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

10.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Equation of state for gases- Zeroth law of thermodynamics- First laws of thermodynamics- Heat engines and second law of thermodynamics	Chalk and talk	21
2	Entropy- Thermodynamic relations- Conduction and radiation	Chalk and talk	17
3	Statistical mechanics- Statistical distributions	Chalk and talk	16

10.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

10.4 Course Outcome

CO-1	Able to understand laws of thermodynamics
CO-2	Able to understand laws of thermodynamics
CO-3	Able to understand the various thermodynamic variables and their importance

10.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	1	0	0	0	0	0	0	0	0
CO-2	3	1	0	0	0	0	0	0	0	0
CO-3	3	1	0	0	0	0	0	0	0	0

10.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	1	3	0	1	1
CO-2	3	2	3	0	1	1
CO-3	3	2	3	0	1	0

Course – XI Semester – VI

Relativity And Spectroscopy

11.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH6CRT10
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	72
9	Hours per Week	4
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

11.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Special Theory of Relativity	Chalk and talk	18
2	Atomic Spectroscopy	Chalk and talk, ICT	21
3	Molecular Spectroscopy- NMR and ESR Spectroscopy	Chalk and talk, ICT	33

11.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

11.4 Course Outcome

CO-1	Able to understand the special theory of relativity
CO-2	Able to understand the special theory of relativity
CO-3	Able to understand the concepts of atomic and molecular spectroscopy and its applications

11.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	1	0	0	0	0	0	0	0	0
CO-2	3	1	0	0	0	0	0	0	0	0
CO-3	3	1	0	0	0	0	0	0	0	0

11.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	1	1	2	1	0
CO-2	3	1	1	2	1	1
CO-3	3	1	1	2	1	1

Course – XII Semester – VI

Nuclear, Particle Physics And Astrophysics

12.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH6CRT11
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

12.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Nuclear structure- Nuclear Radiation Detectors, Counters and Particle Accelerators	Chalk and talk	18
2	Nuclear Transformations- Cosmic rays	Chalk and talk	19
3	Particle Physics- Astrophysics	Chalk and talk	17

12.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

12.4 Course Outcome

CO-1	Able to understand the properties of nucleus and its structure
CO-2	Able to understand the basic concepts various nuclear transformations and the physics of cosmic rays and its properties
CO-3	Able to understand the basic concepts particle physics and astrophysics

12.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	1	0	0	0	0	0	0	0	0
CO-2	3	1	0	0	0	0	0	0	0	0
CO-3	3	1	0	0	0	0	0	0	0	0

12.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	1	3	0	1	0
CO-2	3	2	3	0	1	0
CO-3	3	2	3	0	1	0

Course – XIII Semester – VI

Solid State Physics

13.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH6CRT12
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	4
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

13.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Crystal structure	Chalk and talk	18
2	Bonding in solids- Free electron theory and elementary band theory- Semiconducting properties of materials	Chalk and talk	31
3	Dielectric properties of materials- Magnetic properties of materials- Superconductivity	Chalk and talk	22

13.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

13.4 Course Outcome

CO-1	Able to understand the basic concept related to crystal structure
CO-2	Able to understand the basic concepts of bonding in solids, free electron theory, band theory, semiconducting properties of materials.
CO-3	Able to understand the basic concepts dielectric properties and magnetic properties of materials and superconductivity

13.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	1	0	0	0	0	0	0	0	0
CO-2	3	1	0	0	0	0	0	0	0	0
CO-3	3	1	0	0	0	0	0	0	0	0

13.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	1	3	0	1	2
CO-2	3	2	3	0	1	2
CO-3	3	2	3	0	1	1

Course – XIV Semester – VI

Material Science

14.1 Course Overview

1	Course	Core
2	Course Type	Theory
3	Course Code	PH6CBT02
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

14.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Structure and Properties of Materials	Chalk and talk	18
2	Optical Properties of Materials- Modern Engineering Materials	Chalk and talk	18
3	Nanoscience- Material Characterization Techniques	Chalk and talk	18

14.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

14.4 Course Outcome

CO-1	Able to understand the basic concepts of structure and properties of materials
CO-2	Able to understand the basic concepts of optical properties of materials and modern engineering materials
CO-3	Able to understand the basic concepts of nanoscience and material characterization techniques

14.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	2	2	1	1	0	0	1	0	0	1
CO-2	2	2	1	1	0	0	1	0	0	1
CO-3	2	2	1	1	0	0	1	0	0	1

14.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	2	1	2	0	2	2
CO-2	2	1	2	0	2	2
CO-3	2	1	2	0	2	2

Course – I Semester – I & II

Mechanics And Properties Of Matter(P)

15.1 Course Overview

1	Course	Core
2	Course Type	Practical
3	Course Code	PH2CRP01
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	40
7	Internal Assessment	10
8	Total hours	72
9	Hours per Week	2
10	Number of Experiments	15
11	Total Week to complete	21
Distribution of Internal Marks		
12	Attendance	2
13	Record	4
14	Assessment Test	4 (1 × 4 = 1)

15.2 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Practical Record	Internal Assessment
3	Exprimental Skill	Internal Assessment
4	University Examination	External Assessment

15.3 Course Outcome

CO-1	Have gained practical knowledge by applying the experimental methods related to mechanics, properties of matter
CO-2	Be able to apply the analytical techniques and graphical analysis to the experimental data related to mechanics, properties of matter

15.4 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	3	3	0	3	0	0	3	3
CO-2	3	3	3	3	0	3	0	0	3	3

15.5 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	3	3	0	3	3
CO-2	0	3	3	0	3	3

Course – II Semester – III & IV

Optics and Semiconductor Physics(P)

16.1 Course Overview

1	Course	Core
2	Course Type	Practical
3	Course Code	PH4CRP02
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	40
7	Internal Assessment	10
8	Total hours	72
9	Hours per Week	2
10	Number of Experiments	15
11	Total Week to complete	21
Distribution of Internal Marks		
12	Attendance	2
13	Record	4
14	Assessment Test	4 (1 × 4 = 1)

16.2 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Practical Record	Internal Assessment
3	Exprimental Skill	Internal Assessment
4	University Examination	External Assessment

16.3 Course Outcome

CO-1	Have gained practical knowledge by applying the experimental methods related to optics, semiconductor physics
CO-2	Be able to apply the analytical techniques and graphical analysis to the experimental data related to optics, semiconductor physics

16.4 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	3	3	0	3	0	0	3	3
CO-2	3	3	3	3	0	3	0	0	3	3

16.5 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	3	3	0	3	3
CO-2	0	3	3	0	3	3

Course – III Semester – V & VI

Electricity, Magnetism and LASER(P)

17.1 Course Overview

1	Course	Core
2	Course Type	Practical
3	Course Code	PH6CRP03
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	40
7	Internal Assessment	10
8	Total hours	72
9	Hours per Week	2
10	Number of Experiments	15
11	Total Week to complete	21
Distribution of Internal Marks		
12	Attendance	2
13	Record	4
14	Assessment Test	4 (1 × 4 = 1)

17.2 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Practical Record	Internal Assessment
3	Exprimental Skill	Internal Assessment
4	University Examination	External Assessment

17.3 Course Outcome

CO-1	Have gained practical knowledge by applying the experimental methods related to electricity, magnetism and laser
CO-2	Be able to apply the analytical techniques and graphical analysis to the experimental data related to electricity, magnetism and laser

17.4 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	3	3	0	3	0	0	3	3
CO-2	3	3	3	3	0	3	0	0	3	3

17.5 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	3	3	0	3	3
CO-2	0	3	3	0	3	3

Course – IV Semester – V & VI

Digital Electronics(P)

18.1 Course Overview

1	Course	Core
2	Course Type	Practical
3	Course Code	PH6CRP04
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	40
7	Internal Assessment	10
8	Total hours	72
9	Hours per Week	2
10	Number of Experiments	15
11	Total Week to complete	21
Distribution of Internal Marks		
12	Attendance	2
13	Record	4
14	Assessment Test	4 (1 × 4 = 1)

18.2 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Practical Record	Internal Assessment
3	Exprimental Skill	Internal Assessment
4	University Examination	External Assessment

18.3 Course Outcome

CO-1	Have gained practical knowledge by applying the experimental methods related to digital electronics
CO-2	Be able to apply the analytical techniques and graphical analysis to the experimental data related to digital electronics

18.4 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	3	3	0	3	0	0	3	3
CO-2	3	3	3	3	0	3	0	0	3	3

18.5 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	3	3	0	3	3
CO-2	0	3	3	0	3	3

Course – V Semester – V & VI

Thermal Physics, Spectroscopy and C++ Programming(P)

19.1 Course Overview

1	Course	Core
2	Course Type	Practical
3	Course Code	PH6CRP05
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	40
7	Internal Assessment	10
8	Total hours	72
9	Hours per Week	2
10	Number of Experiments	15
11	Total Week to complete	21
Distribution of Internal Marks		
12	Attendance	2
13	Record	4
14	Assessment Test	4 (1 × 4 = 1)

19.2 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Practical Record	Internal Assessment
3	Exprimental Skill	Internal Assessment
4	University Examination	External Assessment

19.3 Course Outcome

CO-1	Have gained practical knowledge by applying the experimental methods related thermal physics, spectroscopy, c++
CO-2	Be able to apply the analytical techniques and graphical analysis to the experimental data related to thermal physics, spectroscopy, c++

19.4 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	3	3	0	3	0	0	3	3
CO-2	3	3	3	3	0	3	0	0	3	3

19.5 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	3	3	0	3	3
CO-2	0	3	3	0	3	3

Course – VI Semester – V & VI

Acoustics, Photonics and Advanced Semiconductor Physics(P)

20.1 Course Overview

1	Course	Core
2	Course Type	Practical
3	Course Code	PH6CRP06
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	40
7	Internal Assessment	10
8	Total hours	72
9	Hours per Week	2
10	Number of Experiments	15
11	Total Week to complete	21
Distribution of Internal Marks		
12	Attendance	2
13	Record	4
14	Assessment Test	4 (1 × 4 = 1)

20.2 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Practical Record	Internal Assessment
3	Exprimental Skill	Internal Assessment
4	University Examination	External Assessment

20.3 Course Outcome

CO-1	Have gained practical knowledge by applying the experimental methods related to acoustics, photonics, advanced semiconductor physics
CO-2	Be able to apply the analytical techniques and graphical analysis to the experimental data related to acoustics, photonics, advanced semiconductor physics

20.4 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	3	3	0	3	0	0	3	3
CO-2	3	3	3	3	0	3	0	0	3	3

20.5 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	3	3	0	3	3
CO-2	0	3	3	0	3	3

Course – I Semester – I

Properties of matter and Thermodynamics

21.1 Course Overview

1	Course	Complementary
2	Course Type	Theory
3	Course Code	PH1CMT02
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	36
9	Hours per Week	2
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 ($2 \times 4 = 8$)

21.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Elasticity	Chalk and talk	13
2	Surface tension - Hydrodynamics	Chalk and talk	10
3	Thermodynamics	Chalk and talk	13

21.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

21.4 Course Outcome

CO-1	Analyse the theory of elasticity and the experimental methods for the determination of modulus elasticity
CO-2	Analyse the theory and experimental methods of surface tension and liquid flow.
CO-3	Analyse thermodynamic laws and relations and the theory of heat engines

21.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	1	1	0	0	2	0	1	0
CO-2	3	3	1	1	0	0	2	0	1	0
CO-3	3	3	1	1	0	0	2	0	1	0

21.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	0	0	0	1	1
CO-2	3	0	0	0	1	1
CO-3	3	0	0	0	1	1

Course – II Semester – II

Mechanics and Superconductivity

22.1 Course Overview

1	Course	Complementary
2	Course Type	Theory
3	Course Code	PH2CMT02
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	36
9	Hours per Week	2
10	Number of Modules	3
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 ($2 \times 4 = 8$)

22.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Motion under gravity- Rotational dynamics	Chalk and talk	15
2	Ocillations, Waves	Chalk and talk	13
3	Superconductivity	Chalk and talk	8

22.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

22.4 Course Outcome

CO-1	Analyse the theory of motion under gravity and rotational motion
CO-2	Analyse the theory of oscillatory motion and waves
CO-3	Analyse the experimental observations regarding the superconducting phenomenon

22.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	1	1	0	0	2	0	1	0
CO-2	3	3	1	1	0	0	2	0	1	0
CO-3	3	3	1	1	0	0	2	0	1	0

22.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	0	0	0	1	1
CO-2	3	0	0	0	1	1
CO-3	3	0	0	0	1	1

Course – III Semester – III

Modern Physics and magnetism

23.1 Course Overview

1	Course	Complementary
2	Course Type	Theory
3	Course Code	PH3CMT02
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	4
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

23.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Modern Physics	Chalk and talk	18
2	Quantum Mechanics-Spectroscopy	Chalk and talk	18
3	Electronics	Chalk and talk	8
4	Magnetism	Chalk and talk	10

23.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

23.4 Course Outcome

CO-1	To understand the basics of modern physics- atom models, nuclear models and radioactivity
CO-2	To understand the inadequacies of classical physics and the development of quantum theory and its basics principles
CO-3	To understand the basics of semiconductor electronics and fundamentals of magnetism

23.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	1	1	0	0	2	0	1	0
CO-2	3	3	1	1	0	0	2	0	1	0
CO-3	3	3	1	1	0	0	2	0	1	0

23.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	0	0	0	1	1
CO-2	3	0	0	0	1	1
CO-3	3	0	0	0	1	1

Course – IV Semester – IV

Optics and solid state Physics

24.1 Course Overview

1	Course	Complementary
2	Course Type	Theory
3	Course Code	PH4CMT02
4	Credit	3
5	Duration of External Examination	3 hours
6	External Assessment	60
7	Internal Assessment	15
8	Total hours	54
9	Hours per Week	3
10	Number of Modules	4
Distribution of Internal Marks		
11	Attendance	5
12	Assignment/Seminar	2
13	Assessment Test	8 (2 × 4 = 8)

24.2 Curriculum Structure

Module	Module Title	Delivery Methods	Total hours
1	Interference, diffraction and Polarization	Chalk and talk	22
2	laser and fiber optics	Chalk and talk	10
3	Dielectrics	Chalk and talk	10
4	Crystallography	Chalk and talk	12

24.3 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Assignments	Internal Assessment
3	Seminar	Internal Assessment
4	University Examination	External Assessment

24.4 Course Outcome

CO-1	To understand the fundamentals of the optical phenomena-Interference, diffraction and polarization
CO-2	To understand the principles and applications of Lasers and fibre optics
CO-3	To understand crystal structure and crystallography , electrical properties of materials

24.5 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	1	1	0	0	2	0	1	0
CO-2	3	3	1	1	0	0	2	0	1	0
CO-3	3	3	1	1	0	0	2	0	1	0

24.6 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	0	0	0	1	1
CO-2	3	0	0	0	1	1
CO-3	3	0	0	0	1	1

Course – I Semester – I & II

Complimentary Physics Practical I(P)

25.1 Course Overview

1	Course	Complementary
2	Course Type	Practical
3	Course Code	PH2CMP02
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	40
7	Internal Assessment	10
8	Total hours	144
9	Hours per Week	2
10	Number of Experiments	15
11	Total Week to complete	39
Distribution of Internal Marks		
12	Attendance	2
13	Record	4
14	Assessment Test	4 (1 × 4 = 1)

25.2 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Practical Record	Internal Assessment
3	Exprimental Skill	Internal Assessment
4	University Examination	External Assessment

25.3 Course Outcome

CO-1	Have gained practical knowledge by applying the experimental methods related to mechanics, properties of matter and thermodynamics
CO-2	Be able to apply the analytical techniques and graphical analysis to the experimental data related to mechanics, properties of matter and thermodynamics

25.4 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	3	3	0	3	0	0	3	3
CO-2	3	3	3	3	0	3	0	0	3	3

25.5 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	2	0	0	0	0
CO-2	0	0	3	0	0	0

Course – II Semester – III & IV

Complimentary Physics Practical II(P)

26.1 Course Overview

1	Course	Complementary
2	Course Type	Practical
3	Course Code	PH4CMP02
4	Credit	2
5	Duration of External Examination	3 hours
6	External Assessment	40
7	Internal Assessment	10
8	Total hours	144
9	Hours per Week	2
10	Number of Experiments	15
11	Total Week to complete	39
Distribution of Internal Marks		
12	Attendance	2
13	Record	4
14	Assessment Test	4 (1 × 4 = 1)

26.2 Evaluation Methods

No.	Assessment Methods	Evaluation Type
1	Assessment tests	Internal Assessment
2	Practical Record	Internal Assessment
3	Exprimental Skill	Internal Assessment
4	University Examination	External Assessment

26.3 Course Outcome

CO-1	Have gained practical knowledge by applying the experimental methods related to mechanics, properties of matter and thermodynamics
CO-2	Be able to apply the analytical techniques and graphical analysis to the experimental data related to mechanics, properties of matter and thermodynamics

26.4 CO – PO Mapping

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO-1	3	3	3	3	0	3	0	0	3	3
CO-2	3	3	3	3	0	3	0	0	3	3

26.5 CO – PSO Mapping

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	0	2	0	0	0	0
CO-2	0	0	3	0	0	0

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