FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with 'A++' (CGPA 3.61) by NAAC (Cycle - IV)

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT : Research Centre of Physics

NAME OF THE PROGRAMME : B.Sc. PHYSICS

PROGRAMME CODE : UAPH

ACADEMIC YEAR : 2021-2022

PART – III -MAJOR, ALLIED & ELECTIVES – 95 CREDITS

MAJOR CORE COURSES INCLUDING PRACTICALS : 60 CREDITS

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	19P1CC1	Mechanics and Properties of Matter	5	4	40	60	100
2.		19P1CC2	Thermal Physics	4	3	40	60	100
3.		19P1CC3	Major Practicals-I	3	2	40	60	100
4.	II	19P2CC4	Oscillations and Waves	5	4	40	60	100
5.		19P2CC5	Applied Mechanics	4	3	40	60	100
6.		19P2CC6	Major Practicals – II	3	2	40	60	100
7.	III	19P3CC7	Electromagnetism	5	4	40	60	100
8.		19P3CC8	Solid State Physics	4	3	40	60	100
9.		19P3CC9	Major Practicals – III	3	2	40	60	100
10.	IV	19P4CC10	Analog Electronics	5	4	40	60	100
11.		19P4CC11	Materials Science	4	3	40	60	100
12.		19P4CC12	Major Practicals – IV	3	2	40	60	100
13.	V	19P5CC13	Digital Electronics and Communication	6	4	40	60	100
14.		19P5CC14	Optics	6	4	40	60	100
15.		19P5CC15	Major Practicals – V (Electronics)	4	2	40	60	100
16.		19P5CC16	Major Practicals – VI (Non Electronics)	4	2	40	60	100
17.	VI	19P6CC17	Thermodynamics &Statistical Mechanics	5	4	40	60	100

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
18.		19P6CC18	Modern Physics	5	4	40	60	100
19.		19P6CC19	Major Practicals – VII(Electronics)	3	2	40	60	100
20.		19P6CC20	Major Practicals - VIII (Non Elec)	3	2	40	60	100

ALLIEDCOURSES- 20 CREDITS

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKS
1.	I	19P1ACC1	Allied Physics – I	3	3	40	60	100
2.		19P1ACB1	Digital Principles and Applications	5	5	40	60	100
3.		19P1ACC2	Allied Physics Practicals-I	2	2	40	60	100
4.	II	19P2ACC3	Allied Physics – II	3	3	40	60	100
5.		19P2ACC4	Allied Physics Practicals-II	2	2	40	60	100
6.	III	19M3ACP1/ 19G3ACP2	Allied Physics – I	3	3	40	60	100
7.		19M3ACP2/ 19G3ACP2	Allied Physics Practicals –I	2	2	40	60	100
8.	IV	19M4ACP3/ 19G4ACP3	Allied Physics –II	3	3	40	60	100
9.		19M4ACP4/ 19G4ACP4	Allied Physics Practicals – II	2	2	40	60	100

ELECTIVES-15 CREDITS

S.No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	V	19B5MEP1 (Offered by Computer Science)	Programming With C	5	5	40	60	100
2.		19B5MEP2 (Offered by Computer Science)	Web Development	5	5	40	60	100
3.	VI	19P6ME1 / 19P6ME2	Microprocessor / Medical Physics	5	5	40	60	100
4.		19P6ME3/ 19P6ME4	Optoelectronics / Energy Physics	5	5	40	60	100

EXTRA CREDIT COURSE

Course Code	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
19UGSLP1	**SELF LEARNING COURSE for ADVANCE LEARNERS** **Nanoscience and Nanotechnolgy** **(offered for III UG)**	-	2	V	40	60	100
21UGSLP2	**AMAZING UNIVERSE AND INDIAN SPACE MISSIONS**	-	2	II	40	60	100
21UGIDPB1	**FUNDAMENTALS & PROGRAMMING OF MICROPROCESSOR 8085**	-	2	IV	40	60	100
21UGIDPM1	SPACE SCIENCE	-	2	VI	40	60	100

II B.Sc.

SEMESTER III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	19P3CC8	Solid State Physics	Theory	4	3

COURSE DESCRIPTION

Aim of this course is to enable the student to understand the concepts in crystal structure and magnetic and dielectric materials which forms the basis for material world.

COURSE OBJECTIVES

Solid State Physics is basic for material fabrications for various electronic applications. This course aims at giving an idea about crystal structure and various properties of solids like magnetic and dielectric behaviours. This course also deals with the super conductors and their applications.

UNIT I: CRYSTAL STRUCTURE [12 HRS.]

Introduction – crystal lattice and translation vectors-unit cells- basis-symmetry operation-point groups-space groups-types of lattices- lattice directions and planes- interplanar spacing-simple crystal structures-structure of diamond-zinc blende structure and sodium chloride structure

UNIT II: LATTICE VIBRATIONS [14 HRS.]

Introduction-vibration of one dimensional monoatomic lattice-vibration of one dimensional diatomic lattice-phonons-momentum of phonons-inelastic scattering of photons by phonons-specific heat-classical theory of lattice heat capacity- Einstien's theory of lattice heat capacity

UNIT III: MAGNETISM IN SOLIDS (10 HRS.)

Magnetic terminology - types of magnetism - diamagnetism, Langevin's

Classical theory – paramagnetism - Langevin's Classical theory ferromagnetism- Concept of Domains an Hysteresis - antiferromagnetism - ferrimagnetism

UNIT IV: DIELECTRIC PROPERTIES OF SOLIDS (12 HRS.)

Polarization and susceptibility- the local field-dielectric constant and polarizability-sources of polarizability-Electronic Polarizability- Ionic Polarizability – Dipolar Polaizability - frequency dependence of total polarizability - ferroelectricity- Piezo electricity

UNIT V: SUPER CONDUCTIVITY (12 HRS.)

Introduction and historical development- electrical resistivity-prefect diamagnetism or meissner effect-super current and penetration depth-critical field and critical temperature-type I and II superconductor- thermo dynamical and optical properties-isotope effect-flux quantization- the Josephson effects and tunneling - additional characteristics - theoretical aspects-high temperature ceramic superconductors-applications.

UNIT VI: DYNAMISM (Evaluation Pattern-CIA only) (2 HRS.)

Applications of crystals in solar cell - Application of super conductor in MRI body scanner.

REFERENCES

1. R.K.Pure and V.K.Babber "Solid State Physics" First Edition 1997, S.Chand.
2. S.O.Pillai "Solid state Physics" Second Edition 2009, New Age International Publishers.
3. Charles Kittel " Introduction to Solid state Physics" First Edition 2018, Wiley Publishers.

SEMESTER –III

Total Change - 20%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAPH	19P3CC8	Solid State Physics	Major Core	4	3

COURSE DESCRIPTION

Aim of this course is to enable the student to understand the concepts in crystal structure and magnetic and dielectric materials which forms the basis for material world.

COURSE OBJECTIVES

Solid State Physics is basic for material fabrications for various electronic applications. This course aims at giving an idea about crystal structure and various properties of solids like magnetic and dielectric behaviours. This course also deals with the super conductors and their applications.

UNIT I: CRYSTAL STRUCTURE [12 HRS.]

Introduction – crystal lattice and translation vectors-unit cells- basis-symmetry operation-point groups-space groups-types of lattices- lattice directions and planes- interplanar spacing-simple crystal structures-structure of diamond-zinc blende structure and sodium chloride structure

UNIT II: LATTICE VIBRATIONS [14 HRS.]

Introduction-vibration of one dimensional monoatomic lattice-vibration of one dimensional diatomic lattice-phonons-momentum of phonons-inelastic scattering of photons by phonons-specific heat-classical theory of lattice heat capacity- Einstien's theory of lattice heat capacity

Change - 20%

20%

UNIT III: X-ray Diffraction and Reciprocal lattice (10 HRS.)

Introduction-X-ray Diffraction-The Bragg's Treatment: Bragg's law-The Von Laue Treatment: Laue's equations-X-ray Diffraction Methods-The Laue Method-Rotating crystal method-Powder method-Reciprocal lattice- Reciprocal lattice vectors- Reciprocal lattice to simple cubic lattice-Reciprocal lattice to bcc lattice-Reciprocal lattice to fcc lattice-Properties of Reciprocal lattice

UNIT IV: DIELECTRIC PROPERTIES OF SOLIDS

Polarization and susceptibility- the local field-dielectric constant and polarizability-sources of polarizability-Electronic Polarizability- Ionic Polarizability – Dipolar Polaizability - frequency dependence of total polarizability - ferroelectricity- Piezo electricity

UNIT V: SUPER CONDUCTIVITY

Introduction and historical development- electrical resistivity- prefect diamagnetism or meissner effect-super current and penetration depth-critical field and critical temperature-type I and II superconductor- thermo dynamical and optical properties-isotope effect-flux quantization- the Josephson effects and tunneling -additional characteristics - theoretical aspects-high temperature ceramic superconductors-applications.

UNIT VI: DYNAMISM (Evaluation Pattern-CIA only)

Applications of crystals in solar cell - Application of super conductor in MRI body scanner.

REFERENCES

1. R.K.Pure and V.K.Babber "Solid State Physics" First Edition 1997, S.Chand.
2. . S.O.Pillai "Solid state Physics" Second Edition 2009, New Age International Publishers.
3 .Charles Kittel " Introduction to Solid state Physics" First Edition 2018, Wiley Publishers.

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -I CRYSTAL STRUCTURE				
1.1	Introduction to crystals	1	Chalk & Talk	Black Board
1.2	crystal lattice and translation vectors	1	Chalk & Talk	Black Board
1.3	unit cells	1	Demonstration	Models
1.4	Basis	1	Lecture	PPT
1.5	Symmetry Operations	1	Chalk & Talk	Black Board
1.6	Point groups& space groups	1	Lecture	Black Board
1.7	Types of lattices,	1	Discussion	Google classroom
1.8	lattice directions and planes	1	Chalk & Talk	Black Board
1.9	Interplanar spacing	1	Chalk & Talk	PPT
1.10	simple crystal structures	1	Lecture	PPT
1.11	Structure of diamond	1	Chalk& Talk	Black Board
1.12	Zinc blende structure and sodium chloride structure	1	Lecture	Black Board
UNIT -II LATTICE VIBRATIONS				
2.1	Introduction	1	Lecture	Black Board

2.2	Vibration of one dimensional monoatomic lattice	1	Chalk & Talk	PPT & Black Board
2.3	Vibration of one dimensional diatomic lattice	1	Discussion	Black Board
2.4	Phonons	1	Discussion	Black Board
2.5	Momentum of phonons-	1	Chalk & Talk	PPT & Black Board
2.6	Inelastic scattering of photons by phonons	1	Lecture	PPT
2.7	Specific heat	1	Lecture	PPT
2.8	Classical theory of lattice heat capacity	2	Lecture	PPT & Black Board
2.9	Einstein's theory of lattice heat capacity	1	Chalk & Talk	Black Board
2.10	Debye's model of lattice heat capacity	2	Chalk & Talk	Black Board
UNIT - III MAGNETISM IN SOLIDS				
3.1	Magnetic terminology	1	Lecture	Black Board
3.2	Types of magnetism	1	Lecture	Black Board
3.3	Diamagnetism	1	Discussion	PPT
	Langevins classical theory and Quantum theory	2	Lecture	Black Board
3.4	Paramagnetism	1	Lecture	Black Board
	Langevins classical theory and Quantum	1	Discussion	PPT& Black

	theory			Board
3.5	Ferromagnetism	1	Lecture	Black Board
	Weiss theory Nature and origin	1	Lecture	PPT
	Concepts of domain and hysteresis	1	Chalk&Talk	PPT
3.6	Antiferromagnetism	1	Lecture	PPT&Black Board
3.7	Ferrimagnetism	1	Lecture	PPT&Black Board
UNIT – IV DIELECTRIC PROPERTIES OF SOLIDS				
4.1	Polarization and Susceptibility	1	Chalk & Talk	Black Board
4.2	the local field	1	Lecture	PPT
4.3	dielectric constant and polarizability	2	Lecture	PPT
4.4	sources of polarizability	1	Chalk & Talk	Black Board
	Electronic polarizability	1	Chalk & Talk	Black Board
	Ionic polarizability	1	Chalk & Talk	Black Board
	Dipolar polarizability	1	Chalk & Talk	Black Board
4.5	frequency dependence of total polarizability	1	Chalk & Talk	Black Board
4.6	Ferroelectricity	2	Lecture	PPT
4.7	Piezo electricity	1	Chalk & Talk	Black Board
UNIT V SUPER CONDUCTIVITY				

5.1	Introduction and historical development	1	Lecture	PPT
5.2	Electrical resistivity	1	Chalk & Talk	Black Board
5.3	Perfect diamagnetism or meissner effect	1	Chalk & Talk	Black Board
5.4	super current and penetration depth	1	Group Discussion	Black Board
5.5	Critical field and critical temperature	1	Discussion	Google class room
5.6	Type I and II superconductor	1	Discussion	Google class room
	Soft and Hard superconductors		Discussion	Google class room
5.7	Thermo dynamical and optical properties-	1	Chalk & Talk	Black Board
5.8	Isotope effect&flux quantization-	1	Chalk & Talk	Black Board
5.9	The Josephson effects and tunneling	1	Lecture	PPT
5.10	Additional characteristics	1	Chalk & Talk	Black Board
5.11	Theoretical aspects (BCS theory)	1	Chalk & Talk	Black Board
5.12	High temperature ceramic superconductors and its applications.	1	Chalk & Talk	PPT
	UNIT VI DYNAMISM			
6.1	Application of crystals in solar cell	1	Discussion	Google Class Room
6.2	Application of super	1	Discussion	Google Class

	conductor in MRI body scanner.			Room

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC	NON -	MARKS

					SCHOLASTIC			
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Define the different parameters of crystal system and explain the basic concepts.	K1,K2	PSO1& PSO2
CO 2	Describe the various magnetic behaviours of solids	K1,K3	PSO3&PSO4
CO 3	Explain the working of dielectric materials.	K3,K3	PSO1, PSO2 &PSO3
CO 4	Understand the basic concepts in super conductivity.	K2,K4	PSO1& PSO2

CO 5	Describe working and various applications of superconductors.	K2,K3	PSO1, PSO2 PSO4 & PSO5

Mapping COs Consistency with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	1
CO2	2	2	3	3	1
CO3	3	3	3	3	1
CO4	3	3	2	2	1
CO5	3	3	1	3	3

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	2	3	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ ModeratelyCorrelated – **2**
♦ WeaklyCorrelated -**1**

COURSE DESIGNER: Dr.M. Ragam

Forwarded By

Dr. A. Sheela Vimala Rani

HoD'S Signature & Name

OLD

II B.Sc.

SEMESTER IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	19P4CC11	Materials science	Theory	4	3

COURSE DESCRIPTION

The course provides concept based exposure to conducting, dielectric, magnetic, superconducting and other emerging new materials

COURSE OBJECTIVES

This course deals with the elemental concepts of properties of various materials

UNITS

UNIT –I CONDUCTING MATERIALS (12 HRS.)

Material Science-Properties of engineering materials.
Atomic interpretation of ohm's law-Relaxation time and electrical conductivity-Derivation of electrical conductivity of a metal-Electrical and thermal conductivity-Thermal conductivity-Wiedemann Franz law-Thermal expansion-Different types of conducting materials:Low resistivity materials, High resistivity materials

UNIT –II DIELECTRIC MATERIALS (12 HRS.)

Fundamental definitions in dielectrics-Determination of dielectric constant of a dielectric material- Applications of insulating and dielectric materials - Properties and different types of insulating materials

UNIT –III MAGNETIC MATERIALS (12 HRS.)

Introduction - Different types of magnetic materials- Soft Magnetic materials- Hard magnetic materials-Energy product of magnetic materials-Ferrite Core memory-Magnetic recording materials-Magnetic storage media materials- Magnetic principle in computer data storage

UNIT –IV SUPERCONDUCTING MATERIALS (12 HRS.)

Introduction - Explanations for the occurrence of superconductivity-General properties of superconductors-Other observations-Types of superconductors- High temperature superconductors-Preparation & Characterisation of high temperature ceramic superconductors-Perovskite superconductivity- Applications of superconductors

UNIT –V NEW MATERIALS (12 HRS.)

Metallic glasses-fiber reinforced plastics- Metal matrix composites – Biomaterials-Ceramics-Cermets-High temperature materials-Thermoelectric materials-Electrets-Nanophase materials-Shape memory alloys-smart materials-conducting polymers.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (2 HRS.)

New Materials invented in twentieth century that could change human lives

REFERENCES:

1. Dr. M. Arumugam, M. Sethuraman, *Material Science*, Anuradhapublications, Reprint 2010

1. V. Rajendran, *Material science*, TATA Mc GRAW HILL EDUCATIONPVT. LTD. Second Reprint 2013

2. William.D. Callister, Jr., *Materials science and Engineering* – anintroduction (V edition) 2012

WEB REFERNCES :

1. https://easyengineering.net/materialssciencebooks/
2. https://electronicsforu.com/resources/16-free-ebooks-on-material-science

II B.Sc. **NEW**

SEMESTER –IV

Total Change - 20%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	19P4CC11	Materials science	Major Core	4	4

COURSE DESCRIPTION

The course provides concept based exposure to conducting, dielectric, magnetic, superconducting and other emerging new materials

COURSE OBJECTIVES

This course deals with the elemental concepts of properties of various materials

UNITS

UNIT –I CONDUCTING MATERIALS (12 HRS.)

Material Science-Properties of engineering materials.

Atomic interpretation of ohm's law-Relaxation time and electrical conductivity-Derivation of electrical conductivity of a metal-Electrical and thermal conductivity-Thermal conductivity-Wiedemann Franz law-Thermal expansion-Different types of conducting materials:Low resistivity materials, High resistivity materials

UNIT –II DIELECTRIC MATERIALS (12 HRS.)

Fundamental definitions in dielectrics-Determination of dielectric constant of a dielectric material- Applications of insulating and dielectric materials - Properties and different types of insulating materials

UNIT –III NANOMATERIALS Change - 20% **(12 HRS.)** **20%**

Introduction-What are nanomaterials-Where are nanomaterials found-History of Nanomaterials-Classification of Nanomaterials-Why so much interest in nanomaterials-Synthesis and Processing-Methods for creating nanostructures-Mechanical grinding-Wet chemical synthesis of nanomaterials-sol-gel process-Properties of nanomaterials-optical properties-Mechanical properties-selected application of nanomaterials -Disadvantages of nanomaterials

UNIT –IV SUPERCONDUCTING MATERIALS (12 HRS.)

Introduction - Explanations for the occurrence of superconductivity-General properties of superconductors-Other observations-Types of superconductors-High temperature superconductors-Preparation & Characterisation of high temperature ceramic superconductors-Perovskite superconductivity- Applications of superconductors

UNIT –V NEW MATERIALS (12 HRS.)

Metallic glasses-fiber reinforced plastics- Metal matrix composites – Biomaterials-Ceramics-Cermets-High temperature materials-Thermoelectric materials-Electrets-Nanophase materials-Shape memory alloys-smart materials-conducting polymers.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (2 HRS.)

New Materials invented in twentieth century that could change human lives

REFERENCES:

1. Dr. M. Arumugam, M. Sethuraman, *Material Science*, Anuradha publications, Reprint 2010

2. V. Rajendran, *Material science*, TATA Mc GRAW HILL EDUCATION PVT. LTD. Second Reprint 2013

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**CONDUCTING MATERIALS**			
1.1	Properties of engineering materials	2	Chalk & Talk	Black Board
1.2	Atomic interpretation of ohm's law	2	Chalk & Talk	LCD
1.3t	Relaxation time and electrical conductivity of a metal	2	Lecture	PPT
1.4	Electrical and thermal conductivity	1	Lecture	PPT
1.5	Relaxation time, Mean free path	1	Lecture	Black Board
1.6	Wiedemann Franz law	2	Discussion	Google classroom
1.7	Thermal expansion	2	Lecture	Black Board
UNIT -2	**DIELECTRIC MATERIALS**			
2.1	Fundamental definitions in dielectrics	1	Chalk & Talk	Black Board
2.2	Different types of electric polarization	2	Chalk & Talk	LCD
2.3	Frequency and temperature effects on polarization	2	Lecture	PPT
2.4	Dielectric loss	1	Lecture	PPT
2.5	CM relation	2	Lecture	Black Board
2.6	Determination of dielectric constant	2	Discussion	Google classroom
2.7	Insulating materials	2	Lecture	Black

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
				Board
Unit 3 – Magnetic materials				
3.1	Different types of magnetic materials	2	Chalk & Talk	LCD
3.2	Classical theory of diamagnetism	2	Lecture	PPT
3.3	Langevin theory of paramagnetism	2	Lecture	PPT
3.4	Weiss theory	2	Lecture	Black Board
3.5	Molecular theory	2	Discussion	Google classroom
3.6	Heisenberg theory	2	Lecture	Black Board
Unit 4- Superconducting materials				
4.1	Occurrence of superconductivity	2	Chalk & Talk	Black Board
4.2	Properties of superconductors	2	Chalk & Talk	LCD
4.3	Types of superconductors	2	Lecture	PPT
4.4	High temperature superconductors	3	Lecture	PPT
4.5	Applications	3	Lecture	Black Board
Unit 5-New Materials				
5.1	Metallic glass reinforced plastics	1	Lecture	Black Board
5.2	Metal matrix composites	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.3	Biomaterials	2	Chalk & Talk	LCD
5.4	Ceramics, Cermets	2	Lecture	PPT
5.5	High temperature materials	1	Lecture	PPT
5.6	Thermo electric materials	1	Chalk & Talk	Black Board
5.7	Electrets, Nanophase materials	1	Chalk & Talk	LCD
5.8	Shape memory alloys	1	Lecture	PPT
5.9	Smart materials, conducting polymers	1	Lecture	PPT

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	**2**	**2**	**-**	**-**	**-**	**4**	-	**4**	10 %
K2	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
K3	**3**	**3**	**-**	**-**	**5**	**11**	-	**11**	27.5 %
K4	**3**	**3**	**-**	**5**	**-**	**11**	-	**11**	27.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Explain the classical Maxwell's distribution law of velocity and its inference.	K1,K2	PSO1& PSO2
CO 2	Determine electrical conductivity, thermal conductivity of conducting materials	K1, K3,	PSO2 & PSO3
CO 3	Gain the knowledge of properties of various materials	K1,K2	PSO4 & PSO5
CO 4	Explain theory of various magnetic and superconducting materials	K1, K2, K3	PSO1&PSO2
CO 5	Identify new materials that find diverse applications.	K1 & K3	PSO2&PSO5

Mapping COs Consistency with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	1
CO2	2	3	3	2	1
CO3	2	2	2	3	3
CO4	3	3	2	2	1
CO5	2	3	2	2	3

Mapping of COs with Pos

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	3	1	1
CO4	3	3	1	1
CO5	3	3	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated **-1**

COURSE DESIGNER: Mrs. Jeyasheela & Dr. M. Ragam

Forwarded By

Dr. A. Sheela Vimala Rani

HoD'S Signature & Name