SRI RAMAKRISHNA MISSION VIDYALAYA
COLLEGE OF ARTSAND SCIENCE,
COIMBATORE -641 020
DEPARTMENT OF PHYSICS

B.SC. PHYSICS

Mapping of Course outcomes and programme outcomes and programme specific outcomes

B.Sc. Physics Programme

(2018-2019 onwards)

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTSAND

SCIENCECOIMBATORE -641 020

B.Sc.PHYSICS

PROGRAMMEEDUCATIONALOBJECTIVES(PEO)

The programeducationalobjectivesare setinline withInstitutionalandDepartmentalmissionstatements. The program educational objectives of Department of Physics are to produce candidates of goodbasicsknowledgein Physicsconcepts andwholatertakethe roleofresearcherswith following qualities:

PEO1: Consolidates the knowledge acquired at +2 level and improves the ability to solve the problems inphysics

PEO2: Students will have an enhanced proficiency in understanding the physical concepts, principles andtheoriesofPhysics and applying it in day-to-day life.

PEO3: Develop the ability to apply the knowledge acquired in the classroom and laboratories to specificproblemsin theoretical and experimental Physics.

PEO4: Analytical thinking and applying skills to develop initiatives and innovative ideas for R&D, industryandsocial requirements.

PEO5: Developsthelearners'personalitytosuitecurrentindustryenvironmentandentrepreneurial skills

PROGRAMMEOUTCOMES

PO1: ProvideplatformstolearnPhysics,ChemistryandMathematicstheories,conceptsandpracticalskillswithappropriate knowledge.

PO2: Assimilatetheknowledgeonunderstandingthenatureandabilitytolinkthefactstoobserveanddiscoverscientificlaws.

PO3: Createnewskillsandtoolstoobtainpossiblesolutionsincomprehensionofthephysicalscienceproblemsincorporatingmathematical modeling and theories.

PO4: Enhancementofcriticalthinking,problemsolvingskills,digitallyefficientandmakingeffectiveworkingprofessionals tosuitforscience, technical andresearchfield.

PO5: Makingbestsuitablepersonalitiestoservefornationandsocietywith ethicalawarenessandreasoningability.

PROGRAMMESPECIFICOUTCOMES(PSOs)

Thegraduatesableto

PSO1: improve the understanding capabilities in fundamental laws, concepts, principles and theories in thedifferent academic field of Physics and its associated fields. Can understand the basics of computeranddata science. Accomplishtheoretical and laboratoryskills

PSO2:utilize theprocedural knowledge acquired in different areas of study in Physics outlined above inresearchand development, teaching, governmentand publicservices.

PSO3:assimilate interest and to the improve competencies of individuals in specialized area relating to thesubfieldsand current developments in Physics.

PSO4: apply theoretical and laboratory skills to new/unfamiliar contexts to identify problems and issuesrelatingtoPhysics.Skillenhancementinanalysisandformulationofnewtheoriesandconcepts.

PSO5: develop communication abilities to present their findings and results in technical and popular scienceforumsorganized in various universities andother privateorganizations.

CourseTitle: Properties of Matter andSound **Course Code:**18UPH1C01

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	Procureknowledgeon conceptsofgravitationand elasticityofmaterialswithphysical parameterscalculation ability	**K**
CO2	Measurethevaluesofsurfacetensionandviscosityofliquidsatdifferenttemperatures.	**U**
CO3	Understanding of uses and applications of sound energy its measuringtechniques,derivetheequationofmotionforfree,dampedandforcedoscillations.	**K**
CO4	Applytheknowledgeofreverberation-time,absorptionco-efficientcalculations in the construction of good auditorium, acoustics ofbuildings.	**U**
CO5	Impartingtechniquesfor generationofultrasonic wavesandhandlingofCRO	**S**

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	M	S	S	M		S	S	S	L	M
CO2	M	M	M	S	M		M	S	S	S	M
CO3	S	M	S	S	M		S	M	S	S	M
CO4	S	S	M	S	M		S	S	S	S	S
CO5	M	S	M	S	L		S	M	M	S	S

S-Strong; M -Medium;L-Low

CourseTitle: Electricity and Magnetism **Course Code:** 18UPH2C02

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	Constructlinearcircuitsandphenomenonofseriesandparallelresonancecircuits.	U
CO2	Predictsthemotionofchargedparticlesinelectric andmagneticfields.	K
CO3	Explainthebasicsofcapacitors,capacitanceofcapacitorsandroleofresistanceinelectrical circuits.	K
CO4	Understand various laws and principles related magnetism and magneticinduction	K
CO5	Classifythemagneticmaterialsandanalyzetheirbehaviorsusingassociatedtheories	S

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	M	M	M	M		S	S	M	S	M
CO2	S	M	S	M	L		S	M	S	S	M
CO3	S	M	S	S	M		S	S	M	S	L
CO4	S	M	M	S	M		S	S	M	M	L
CO5	S	S	M	S	M		S	S	M	S	M

S-Strong; M -Medium;L– Low

CourseTitle : Electronics **CourseCode:**18UPH3C03

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbe able to

CO1	Acquaintaboutbasicprinciplesofsemiconductormaterialsanddevices.	**K**
CO2	explorethevariousparametersofTransistoramplifiers,OP-AMPandOscillators	**K**
CO3	Elucidatetheconceptsofrectifiersandabletodesignownpowersupplies.	**U**
CO4	Differentiateanalogandigitalsystemsandtoworkwith variousnumbersystems involved in digitaltechnology	**S**
CO5	designanddevelopdigitalcircuits,essentialforcalculationandprocessing,	**S**

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	M	L	M		S	S	S	M	L
CO2	S	M	M	S	M		S	S	M	S	L
CO3	S	S	M	M	M		S	S	S	S	M
CO4	S	M	S	S	M		S	S	S	M	S
CO5	M	S	S	S	L		S	S	M	S	S

S-Strong; M -Medium;L-Low

CourseTitle :Heat,ThermodynamicsandStatisticalMechanics

Course Code :18UPH4C04

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	Elucidatethebehaviorof gaslaws andtheprincipleofkinetictheory	**K**
CO2	Assimilatethesignificanceofthermal conductionandradiation	**K**
CO3	Compare the various methods of production of low temperature and tounderstandtheirapplications	**U**
CO4	Applytheprinciples andlawsto determinethe entropy ofasystem	**U**
CO5	Calculatetheefficiencyofheatenginesdistinguishclassicalstatisticsandquantumstatistics	**S**

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	S	M	L		S	S	M	M	M
CO2	S	S	M	S	M		S	S	S	M	M
CO3	M	S	M	S	M		M	S	S	S	M
CO4	S	M	S	S	M		S	S	M	S	S
CO5	M	M	S	S	M		S	M	S	S	M

S-Strong; M -Medium;L-Low

CourseTitle **:**Mathematical Physics and Classical Mechanics **Course Code:** 16UPH5C05

COURSEOUTCOMES(CO*)*

Bythe endofthecourse,thestudents willbe able to

CO1	Knowaboutthescalarandvectorfields,identitiesand theorems	**K**
CO2	Formulatevarietyofphysicalsystemsbymeansof variouscoordinatesystemswith thebenefit of vector concepts.	**K**
CO3	Solveelectrical circuitproblemsusingconceptofLaplacetransformation	**S**
CO4	Assimilatecomplexvariablesandspecialfunctions	**K**
CO5	SetupLagrange'sequationofmotionformechanical,electricalandharmonics ystems	**U**

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	M	S	S	M	L		S	S	S	S	M
CO2	S	S	S	M	M		S	S	M	S	M
CO3	S	S	S	S	M		S	S	S	M	M
CO4	M	S	S	M	M		M	S	S	S	L
CO5	M	S	S	S	S		M	S	S	S	M

S-Strong; M -Medium;L-Low

Course Title : Optics **Course Code:**16UPH5C06

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	Enrichthelevelofunderstandingondeterminationofdifferentparameters like focal length, magnification, refractive index of differentmedium,wavelength,thickness,velocityoflight,specificrotationetc.,	K
CO2	Assimilatetheoriesandproductionofinterference,usesofinterferometers and to determine refractive indices of optical materialsusingvariety of refractometers methods.	K
CO3	Knowabouttheconceptofdiffraction,utilityofdiffractometersanditsusesin spectral Analysis.	K
CO4	AnalyzePolarizationthroughopticalactivityofthemediumandworkwithcrystal technologies.	U,S
CO5	Applytheseideasonfabricatingdifferent opticalsparepartsforvariousapplications such as setting up of microscope, telescope and cameralenses.	U

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	S	M	M		S	S	S	M	M
CO2	S	S	S	S	M		S	S	S	S	M
CO3	S	S	S	S	M		S	S	S	S	M
CO4	M	S	M	S	M		S	M	S	S	S
CO5	S	M	M	S	S		S	S	M	S	M

S-Strong; M -Medium;L-Low

CourseTitle: Atomic Physics andSpectroscopy **Course Code:** 18UPH5C07

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	Gainknowledgeaboutstructureofatoms,variousatomicmodelsandproductiono fatomicspectra.	**K**
CO2	Clarifytheimportanceof variousatomicmodelsandelectronicconfigurationofelements.	**K**
CO3	Analyzethebehaviorof anatom undertheinfluenceof electricandmagneticfield with appropriate experimentalsetups	**S**
CO4	DistinguishclassicalandquantumtheoryofRamaneffect	**K**
CO5	Applydifferentspectroscopictechniquestostudythespectrographobtainedfr om spectroscopic devices.,	**U**

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	M	M	L		S	S	M	M	M
CO2	M	S	S	S	M		S	S	M	M	M
CO3	M	S	S	M	M		S	S	S	S	M
CO4	M	S	S	M	M		M	S	M	S	M
CO5	M	S	S	S	M		S	S	M	S	S

S-Strong; M -Medium;L-Low

CourseTitle : Microprocessor and its Physics Applications **Course Code:** 18UPH5C08

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	UnderstandthearchitectureofMicroprocessor,Microcomputersandtheirdev elopments.	**K**
CO2	Handletheinstructionformatandinstructionsetinassemblylevelprogrammingused in secondgeneration microprocessor	**K**
CO3	Writeapplication-orientedassemblylevelprogrammingformicrocontrollers and microprocessors-based systems like stepper motorcontrolsand trafficcontrol systems etc.,	**U**
CO4	Developskillstointerfacevarietyofprogrammablecontrollerswith8085processor in research and technology	**U**
CO5	Acclimatethetechniquesinvolvedininterfacingmemoryandinterruptcontroller sand theirutility inthe fieldofcomputer technology	**S**

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	M	M	M		S	S	S	M	M
CO2	S	S	S	M	M		M	S	S	M	M
CO3	S	S	S	M	S		S	M	S	S	S
CO4	M	S	M	S	M		S	M	S	S	L
CO5	M	M	S	S	M		S	M	S	S	S

S-Strong; M -Medium;L-Low

CourseTitle :Relativity, WaveMechanics andAstrophysics

SubjectCode : 18UPH 6C09

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	Know about postulates and theories of relativity, basics of quantummechanicalconceptssuchasoperatorsandeigenfunctions.Elucidate detailsof spacephysics.	K
CO2	Elaborateexperimentalevidencesofdualnatureofmatterwaves	K
CO3	Handleoperators,functionsinvolvedinquantumequationsassociatedtosubatomic problems	K
CO4	Settingupofquantumequationsforsubatomicsystemsandtoanalyzetheirbehaviors.	S
CO5	Portray the principle associated to stellar evolution, concept of spacephysicsand launchingmechanism of satellitesand rockets	U

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	M	S	S	M		S	S	M	M	L
CO2	S	M	S	S	M		M	S	S	M	M
CO3	S	M	S	M	M		M	S	S	S	M
CO4	M	S	S	S	M		M	S	S	S	M
CO5	S	M	S	M	L		S	S	M	M	M

S-Strong; M -Medium;L-Low

CourseTitle : Solid State Physics **Course Code :** 18UPH 6C10

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	Procure knowledge on elements of crystallography, structuraldetermination, conductivity laws and theories of solids, properties ofdielectric,and superconductors and newmaterials	K
CO2	Elucidatetheconceptsoffree electrontheoryandbandtheoryofsolids	K
CO3	Usedielectric andsmart materialsinvariousfields	U
CO4	Analyzethebehavior of superconductorsin magneticlevitation	S
CO5	Understandthebehavioursofnewmaterialslikeceramics,shapememoryalloys, biomaterials andmetal matrixcomposites.	K

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	S	M	M		S	S	S	M	M
CO2	S	S	S	M	M		S	M	S	M	L
CO3	S	S	S	M	M		S	S	S	M	M
CO4	M	S	S	S	M		M	S	M	S	M
CO5	S	S	M	S	L		S	S	M	M	M

S-Strong; M -Medium;L-Low

CourseTitle: NuclearPhysics **Course Code:** 18UPH 6C11

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudentswill beableto

CO1	Elucidateradioactivitylaws,nuclear radiationdetectors,nuclearmodels,properties of nucleus, nuclear hypothesis, types of nuclear reactions andbasictheories ofelementary particles.	K
CO2	Solveproblemsrelated tohalf-lifeandmean lifeperiod, ageof theearththroughthe radio activity	U
CO3	Distinguishnuclearmodelsandnuclear reactions	S
CO4	Understandthebehaviorofcosmicraysandelementaryparticles	K
CO5	Performoverallanalysesofnuclearpower plantsfromaman,machineandorganizational (human factors)point of view	S

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	M	M	L		S	S	M	M	M
CO2	M	S	S	M	M		M	S	M	S	M
CO3	M	S	M	S	M		M	S	S	S	S
CO4	S	M	S	M	M		M	S	S	S	M
CO5	M	M	S	S	S		M	S	M	S	S

S-Strong; M -Medium;L-Low

CourseTitle : Programming in C And Its Physics Applications **Course Code:**18UPH 6C12

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	AssimilatethebasicstructureofCprogramming,datatypes,variablesandbasic functions	K
CO2	Understand the different control, branching structure and writeprogrammesusing them	K
CO3	Handlestructurevariables andunionsin programmewriting	U
CO4	Declarepointersandhandlingfilesinprogrammewriting	U
CO5	Apply the programming skill in physical science, simulation andtechnology	S

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	M	S	M		S	M	S	M	S
CO2	S	S	S	S	L		M	S	S	S	M
CO3	M	M	S	S	M		S	M	S	S	S
CO4	M	M	S	S	M		M	S	S	S	M
CO5	M	S	M	S	M		M	M	S	S	S

S-Strong; M -Medium;L-Low

CourseTitle : Alternate Energy Resources **Course Code:**16UPH6EL1

COURSEOUTCOMES(CO)

Bythe endofthecourse,thestudents willbeable to

CO1	Identify types of solarradiation and measuring instruments	**K**
CO2	Understandthe workingofbiogas plantsand windmills	**K**
CO3	DesignandimplementsolarPVvoltaicsystems,solarpumbinganddifferentsolar thermal devices	**U**
CO4	Analysesanddevelopenergybalanceequations	**S**
CO5	Categorizedifferentenergystoragesystemsandindirectsourcesofsolarenergy	**S**

K-Knowledge;U-Understand;S-Skill

MAPPING

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	S	M	M		S	S	M	M	M
CO2	S	S	M	M	S		M	M	S	S	S
CO3	M	M	S	S	S		M	S	S	S	S
CO4	M	M	S	S	S		M	S	S	S	S
CO5	S	S	M	S	M		S	S	M	S	M

S-Strong; M -Medium;L-Low

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH1C01
Course Title : **PROPERTIES OF MATTER AND SOUND**
Core : 1
Year : I Semester: I
5 Hours/Week 5 Credits

UNIT - I: GRAVITATION

Newton's law of gravitation from Kepler's laws – Determination of 'G' by Boy's method – Poynting's method - Variation of 'g' with altitude, depth and latitude – Gravitational potential and field – solid, hollow spheres and Spherical shell.

UNIT - II: ELASTICITY

Relation between module of elasticity and Poisson's ratio – Work done in stretching and twisting – Twisting couple of a cylinder – Rigidity modulus – Static torsion and Torsional oscillations –uniform and non-uniform bending - Bending moment - 'q' by Koenig's method – Cantilever oscillations.

UNIT - III: SURFACE TENSION AND VISCOSITY

Molecular theory – Relation between curvature, pressure and surface tension – Applications to cylindrical, spherical drops and bubbles – Surface tension by Quincke's method, Jacgor's method and Ripple method – Variation of surface tension with temperature.

Poiseuille's formula – Viscosity by capillary flow method – Motion through highly viscous liquids-Stoke's formula - Viscosity of gases – Rankine's method.

UNIT - IV SOUND WAVES AND MEASUREMENTS

Laws of transverse vibration of strings -Velocity of transverse waves along a stretched string – Melde's experiment –Closed end organ pipe –Open end organ pipe. Classification of sound – Intensity of sound –Measurement of intensity of sound - Doppler effect –Microphones and loud speakers –Wave front at super sonic speed.

UNIT-V ACOUSTICS

Reverberation –Sabine's formula –Determination of absorption coefficient –Factors affecting the acoustics of building and their remedies –Ultrasonic waves – protection and applications – Acoustic grating –Wave velocity and group velocity – Frequency measurements – Study of waves using CRO - CRO Applications – Lissajou's figures.

TEXT BOOK:1

Author : Brijlal and Subramaniam,
Book Name: Properties of Matter
Publication: Educational & university Puplishers Agra.
Year: 1995
Edition: 1st
UNIT-I-III

2. Author : Brijlal and Subramaniam,
Book Name: A Text Book of Sound
Publication: Vikas Publishing House Pvt.Ltd.
Year: 1978
Edition:2nd
UNIT- IV&V

References/E-Resources:

1. H. J. Pain, The Physics of Vibrations and Waves, John Wiley, (2005), 6th Edition
2. David Halliday, Robert Resnick and Jearl Walker, Fundamentals of Physics, John Wiley & Sons , New Delhi , 9th Edition , 2010
3.. http://ocw.mit.edu/courses/#physics
4. http://hyperphysics.phy-astr.gsu.edu
5. https://www.coursera.org
6. http://nptel.ac.in/courses/115106090/

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020
For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH2C02
Course Title : **ELECTRICITY AND MAGNETISM**
Core : 2
Year : I Semester : II
5 Hours/Week 5 Credits

UNIT-I: CURRENT ELECTRICITY

Electrical measurements: Potential difference – Electric current – Ohm's law – Resistance – Resistances in series and parallel – Kirchhoff's laws - Ammeters and voltmeters. R, C, L, RC, RL and RLC Circuits in AC and DC

UNIT-II: ELECTROSTATICS

Gauss's theorem and its applications- Coulomb's law – Mechanical force experienced by unit area of a charged sphere – Electrified soap bubble – Electrical images (Basics Only). Capacitors: Capacity of a conductor- Energy of a charged conductor- Sharing of energy between two capacitors - Principle of a capacitor- capacity of a spherical and cylindrical capacitorsCapacitors in series and in parallel.

UNIT- III: MAGNETIC INDUCTION

Biot-Savart law – Ampere's circuital law – Lorentz force - Electromagnetic Induction: Faraday's laws – Lenz's law - Fleming's right hand thumb rule – Self inductance – Self inductance of a long solenoid – Determination of self inductance by Rayleigh's method – Mutual inductance – mutual inductance between two solenoids – Determination of mutual inductance.

UNIT- IV: MAGNETISM

Magnetic potential – potential and intensity at a point due to a bar magnet- magnetic intensity at any point due to bar magnet - magnetic potential at a point due to a magnetized sphere – magnetic shell – potential at a point due to a magnetic shell – permeability – susceptibility – Relation between μ and χ - Gauss theorem in magnetism - applications.

UNIT –V: MAGNETIC PROPERTIES OF MATERIAL

Magnetic induction – Magnetization M – Properties of dia, para and ferro magnetic materials – Anti ferro magnetism and ferri magnetism - Electron theory of magnetism – Langevin's theory of para magnetism - Weiss's theory of ferro magnetism – determination of draw M-H curve (horizontal model) – Energy loss due to hysteresis.

TEXT BOOK:1

Author : Brijlal and Subramaniam
Book Name: Electricity and Magnetism
Publication: Ratan Prakashan Educational & University Publishers,
Year: 1992
Edition: 19th

2. Author : R. Murugesan
Book Name: Electricity and Magnetism
Publication: Sultan Chand & Sons,
Year: 1998
Edition:2

Reference/E-Resources:

1. Author : Sehgal, Chopra and Sehgal
Book Name: Electricity and Magnetism
Publication: Sultan Chand & Sons, Delhi
Year: 1980
Edition:3rd

2. Author : D.N. Vasudeva
Book Name: Electricity and Magnetism

3. Author : Nagarathanam and Lakshminarayanan
Book Name: Electricity and Magnetism

4.http://ocw.mit.edu/courses/#physics
5.http://hyperphysics.phy-astr.gsu.edu
6.http://nptel.ac.in/courses/108106073

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS) COIMBATORE -641 020
For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Course Code: **18UPH3C03**
Course Title : **ELECTRONICS**
Core : 3
Year : II Semester : III
5 Hours/Week 5 Credits

UNIT – I: SEMICONDUCTOR FUNDAMENTALS

Energy band in solids – types of semiconductor – majority and minority carriers – Mobile charge carriers and immobile ions – drift current in intrinsic semiconductor – PN junction – Depletion layer – barrier voltage – Effect of temperature – forward biased and reverse biased pn junction – Zener breakdown – Avalanche breakdown – H parameters in CE and CB configuration.

UNIT-II: AMPLIFIERS

Single stage Transistor amplifiers – CB,CE and CC – comparison of amplifier configuration – Amplifier classification based on the biasing condition – Class B push-pull amplifier – Complementary Symmetry push-pull class B amplifier – Distortion in amplifiers – RC and Transformer coupled two stage amplifiers – Direct-couple amplifier using complementary and symmetry of two transistors – Darlington pair

UNIT-III: SINUSOIDAL AND NON SINUSOIDAL OSCILLATORS

Comparison between an amplifier and oscillator – Damped and undamped Oscillations – Tuned base oscillator – Tuned collector oscillator - Hartley and Colpitt's oscillator Phase shift oscillator and Crystal controlled oscillator – Astable and Bistable multivibrator.

UNIT – IV: POWER SUPPLY AND OPERATIONAL AMPLIFIER

Rectifiers – Half wave - full wave rectifiers – voltage regulation using Zener diode and transistor-Characteristics of ideal and practical operational amplifiers – Inverting and Non-inverting amplifier – Adder – Subtractor - Integrator – Differentiator - Comparator.

UNIT-V: DIGITAL FUNDAMENTAL AND DEVICES

Basic logic gates – Demorgan's theorem – NAND and NOR as a universal gates – Half adder – Full adder - Half subtractor – Full subtractor – 4 Bit binary adder – RS flip flop- J-K flip flop – Digital to Analog Converter (R-2R ladder D/A converter) – Analog to Digital converter (Counter type A/D converter).

TEXT BOOK:

1. B L Theraja, "Basic Electronics", S.Chand and company Ltd, 2001, Edition: 11th - UNIT : I-IV
2. V. Vijayendran, "Introduction to Integrated Electronics Digital and Analog", 2007, Edition: 1st, Reprint 2007.
3. Malvino and Leech, "Digital Principles & Application", McGraw Hill Company, Unit – V

REFERENCE BOOK:

1. V .K. Metha, “Principles of Electronics”, S.Chand and company Ltd, 1983,Edition: 3rd.
2. R.S. Sedha, “Applied Electronics”, S.Chand and company Ltd, Reprint Year: 2010

References/E-Resources:

4. H. J. Pain, The Physics of Vibrations and Waves, John Wiley, (2005), 6th Edition
5. David Halliday, Robert Resnick and Jearl Walker, Fundamentals of Physics, John Wiley & Sons , New Delhi , 9th Edition , 2010
3.. http://ocw.mit.edu/courses/#physics
4. http://hyperphysics.phy-astr.gsu.edu
5. https://www.coursera.org
6. http://nptel.ac.in/courses/115106090/

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS) COIMBATORE -641 020
For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Course Code: **18UPH4C04**
Course Title : **HEAT, THERMODYNAMICS AND STATISTICAL MECHANICS**
Core : 4
Year : II Semester : IV
5 Hours/Week 5 Credits

UNIT –I: THERMOMETRY AND EXPANSION

Concept of heat and temperature- Centigrade and Fahrenheit Scales-Types of thermometer- Platinum resistance thermometer-Expansion of solids- Coefficient of liner expansion -Coefficient of superficial expansion-relation between α and β-Expansion of liquids -Relation between Co-efficient of apparent and real expansion.

UNIT – II: TRANSMISSION OF HEAT

Coefficient of thermal conductivity- Forbe's method -Lee's method for bad conductors - Radial flow of heat -Widemann Franz's law -Stefan's law and verification -Newton's law of cooling -Wein's law Rayleigh jeans law and Planck's law -Solar constant -Surface temperature of sun -Angstrom's Pyroheliometer.

UNIT – III: LOW TEMPERATURE PHYSICS

Porous plug experiment and its results - Joule Kelvin effect -Temperature of inversion -Liquefaction of air, Liquefaction of hydrogen, Liquefaction of helium -Adiabatic demagnetization – Electrolux Refrigerator.

UNIT – IV: THERMODYNAMICS

First law of Thermodynamics - Determination of γ -Clement and Desormer's method -Second law of thermodynamics – Carnot engine-Otto Cycle -Clausius clapcyron's latent heat equation and its applications -Entropy -Third law of thermodynamics -Entropy of a perfect gas -Entropy diagram -Zero point energy -Maxwell's Thermo dynamical relations

UNIT – V: STATISTICAL MECHANICS

Statistical equilibrium -Probability theorems in statistical thermodynamics- Maxwell Boltzmann distribution in terms of temperature -Ideal gas- Quantum statistics -Phase space - Bose Einstein statistics -Distribution law -Photon gas - Fermi Dirac statistics -Distribution law -Electron gas -Comparison of three statistics.

TEXT BOOK:

1. Brijlal and Subramanyam, "Heat and Thermodynamics", S. Chand & Company, 2006,Edition: 16th
2. D.S. Mathur, "Heat and Thermodynamics", S.Chand and Co,1970,Edition: 3rd.
3. A.B Gupta & H.P. Rai,"Heat and Thermodynamics", New central book,1995,Edition: 1st

References/E-Resources:

1. David Halliday, Robert Resnick and Jearl Walker, Fundamentals of Physics, John Wiley & Sons , New Delhi , 9th Edition , 2010
2. http://ocw.mit.edu/courses/#physics
3. http://hyperphysics.phy-astr.gsu.edu
4. https://www.coursera.org
5. http://nptel.ac.in/courses/115106090/

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH5C05
Course Title : **MATHEMATICAL PHYSICS AND CLASSICAL MECHANICS**
Core : 5
Year : III
Semester : V:
5 Hours/Week 5 Credits

UNIT – I: VECTOR CALCULUS

Gradient of a scalar field – line, surface and volume integral – Divergence of a vector function – examples – Curl of a vector function – Important vector identities – Gauss divergence theorem – Stoke's theorem – Green's theorem – examples.

UNIT – II: COORDINATE SYSTEMS

Curvilinear coordinates – transformation of coordinates – orthogonal curvilinear coordinates – unit vectors in curvilinear systems – cylindrical coordinates – spherical polar coordinates – curl, divergence and gradient in curvilinear, cylindrical and spherical polar coordinates.

UNIT – III: MATRICES

Special types of matrices -Properties of unitary and orthogonal matrices -Eigen values and Eigen functions- Cayley - Hamilton theorem- Diagonalisation of matrix -Solution of quadratic equations by matrix method.

UNIT – IV: COMPLEX VARIABLES AND SPECIAL FUNCTIONS

Complex analysis- Analytic functions – Cauchy - Riemann equations- Cauchy's Integral theorem - Integral formula-Residues -Residue theorem (Definite integrals of trigonometry functions of cos θ and sin θ).

Special Functions : Definition – Beta function – Gamma function – Evaluation of Beta function – Evaluation of Gamma function – Relation between Beta and Gamma functions.

UNIT – V: LAGRANGE'S FORMULATION

Conservation theorem – linear and angular momentum - energy – Degress of freedom – constraints – Generalized co-ordinates – transformation equations – Generalized displacement, velocity, acceleration, momentum and force – Principle of virtual work – D' Alembert's principle – Lagrange's equation of motion – linear Harmonic Oscillator, Simple Pendulum and Compound Pendulum.

TEXT BOOK

1. Author : Satya Prakash
Book Name: Mathematical Physics with Classical Mechanics
Publication: Sultan Chand & sons
Year: Reprint 2007
Edition: Reprint 2007 (UNIT:I – V)

REFERENCE BOOK

1. Author : B.D.Gupta
Book Name: Mathematical Physics
Publication: Vikas Publishing house Year: Reprint, 1997
Edition: Reprint, 1997
2. Author: R. Murugeshan
Book Name: Mechanics and Mathematical Physics,
Publication: S.Chand, Edition 2008

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH5C06
Course Title : **OPTICS**
Core : 6
Year : III Semester : V
5 Hours/Week 5 Credits

UNIT – I: OPTICAL INSTRUMENTS

Aberrations: – Lens aberrations – spherical aberrations – reducing spherical aberrations – comma – astigmatism – distortion – chromatic aberration – achromatic lens- telephoto lens- microscope – simple microscope-compound microscope- Telescope: angular magnification of telescope- Refracting Astronomical - Reflecting Astronomical - Reflecting telescopes - Eye pieces: Huygens and Ramsden – comparison – Velocity of light: Michelson's rotating mirror method - Houston's method.

UNIT – II: INTERFERENCE

Young's experiment-Coherent sources – phase difference and path difference- theory of interference fringes- Fresnel's Biprism – Lloyd's single mirror- Billet's split lens- Interference in thin films- interference due to reflected light- Colours of Thin Film - Newton's rings - Determination of the wavelength of the sodium light - Refractive index of a liquid - Newton's rings with white Light – Haidinger's fringes- Michelson Interferometer – visibility of fringes- applications- determination of the refractive index of gases – Jamin's Refractometer – Mach-Zehnder refractometer - Rayleigh's Refractometer - Fabry Perot Interferometer.

UNIT – III: DIFFRACTION

Fresnel assumptions - Rectilinear propagation of light - Zone plate -action of zone plate for an incident spherical wave front –difference between a zone plate and a convex lens-Fresnel and Fraunhofer Diffraction –diffraction at a circular aperature- diffraction at an opaque circular disc Fresnel Diffraction at a Straight edge- intensity at a point inside the geometrical shadow (straight edge) - Fresnel Diffraction at a narrow slit and Narrow wire- Fraunhofer Diffraction at a Single slit and Double slit - Plane Transmission grating - Dispersive power of grating.

UNIT – IV: POLARISATION

Polarization of transverse waves –plane of polarization- Brewster's law- polarization by refraction -Double refraction - Nicol prism – Nicol prism as an analyser- Huygen's theory for uniaxial crystals - Quarter wave plate and half wave plate - Production and Detection of Plane, Circularly and Elliptically Polarized light - Babinet's compensator – Dichroism- Optical activity - Fresnel's Explanation of optical rotation – Experimental verification - Specific rotation: Laurent's half shade polarimeter.

UNIT – V: LASERS AND FIBRE OPTICS

Lasers: Induced absorption - spontaneous emission and stimulated emission – The ruby laser – semiconductor laser.

Fibre Optics : Introduction – optical fibre – optical fibre system – optical fibre cable – total internal reflection – propagation of light through and optical fibre - critical angle of propagation – acceptance angle – numerical aperture – skip distance and number of total internal reflections – classification of optical fibres – The three types of fibres - single mode step index fibre – multimode step index fibre – graded index fibre –fibre optic communication system – merits of optical fibres.

TEXT BOOK :

1. Author: N. Subramaniam and Brijlal
Book Name: A Textbook of Optics
Publication: S.Chand & Co Ltd, New Delhi
Year: 2010
Edition: 24

REFERENCE BOOK:

1. Author: Subir Kumar Sarkar
Book Name: Optical Fibers and Fiber Optic Communication Systems
Publication: S.Chand & Co
Year: 2001

3. Author : Murugesan. R
Book Name: Modern physics
Publication: S.Chand & co.,
Year: 2007
Edition: 13th

2.Author : Ananthakrishanan,
Book Name: A text book of light
Publication: S.Viswanathan & co, Chennai
Year: 1966
Edition: 2nd Edition

4. Author : Ajoy K. Ghatak
Book Name: Modern optics
Publication: Tata Mc Graw-Hill Pub. Co. Ltd. Delhi

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH5C07

Course Title : **ATOMIC PHYSICS AND SPECTROSCOPY**

Core : 7

Year : III Semester : V

5 Hours/Week 5 Credits

UNIT-I: STRUCTURE OF THE ATOM

Introduction- Rutherford experiments on α particle scattering- Experimental verification- Bohr atom model – Critical potentials - atomic excitation – Experimental determination of critical potentials - Franck and Hertz method – Davis and Goucher's method - Mass spectrograph: Aston's mass spectrograph – Dempster's mass spectrograph.

UNIT- II: ATOM MODEL

Sommerfeld's relativistic atom model – The Vector atom model – Quantum numbers associated with the vector atom model – Coupling schemes – L-S coupling –J J coupling – The Pauli's exclusion principle – magnetic dipole moment – The stern and Gerlach Experiment – Spin orbit coupling.

UNIT- III: OPTICAL SPECTRA

Zeeman effect – Larmor's theorem – Paschen back effect – Stark effect – Production of X-rays – Bragg's law – Bragg's X-ray spectrometer – X- ray spectra – Characteristics of X-ray spectra – Mosley's law – Compton effect – Photo electric effect – Experimental investigation – Einstein's Photo electric equation – Photo voltaic cell.

UNIT- IV: MOLECULAR SPECTRA AND RAMAN EFFECT

Molecular spectra: Introduction – Origin of molecular spectra – Nature of molecular spectra – Rotation of linear system – Non rigid rotator -Theory of the origin of pure rotational spectrum of a molecule – Electronic spectra of molecule.

Raman effect: Experimental study of Raman effect – Quantum theory of Raman effect – applications- Laser Raman spectroscopy - Classical theory of Raman effect - vibrational Raman spectra of diatomic molecules.

UNIT-V: SPECTROSCOPIC TECHNIQUES

The energy of a diatomic molecule – vibrating diatomic molecule as a harmonic oscillator - spectroscopic techniques – constant deviation spectrograph – recording the spectrum – UV spectroscopy – Quartz spectrograph for near UV region - Infra red spectroscopy – absorption spectroscopy – Double beam IR spectrometer –Raman spectroscopy – Raman spectrometer.

TEXT BOOK:

1.Author : Murugesan. R

Book Name: Modern physics

Publication: S.Chand & co.,

Year: 2007

Edition: 13th

REFERENCE BOOK:

1. Author : J.B. Rajam

Book Name: Atomic Physics

Publication: S.Chand and Co

2. Author : Gurdeep Chatwal and Sham Anand

Book Name: Spectroscopy

3. Author : Gupta kumar Sharma

Book Name: Elements of Spectroscopy

Publication: Pragati prakashan, Meerut,

Edition : 23, Year : 2011

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH5C08

Course Title : **MICROPROCESSOR AND ITS PHYSICS APPLICATIONS**

Core : 8

Year : III Semester: V

5 Hours/Week 5 Credits

UNIT – I: INTRODUCTION TO INTEL 8085 MICROPROCESSOR AND MEMORY

Evolution of Microprocessor-First, second, third and fourth generation microprocessors- Microprocessor based systems - Micro, Mini and Large computers - Advantages and disadvantages of microprocessor based system - General description of Intel 8085 - Pin configuration - 8085 Signal description summary - Block diagram of Intel 8085 - Intel 8085 architecture - Introduction to memory – Semiconductor memory - ROM, PROM, EPROM, static RAM, DRAM and NOVRAM

UNIT – II: INSTRUCTION SETS AND BASIC PROGRAMMING

Instruction format of 8085 – Basics of Addressing modes-Instruction set –Data transfer Instructions - Arithmetic instructions – ADD reg; ADI d8; ADD M; ACI d8; ADC reg; ADC M; SUB reg; SUI d8; SUB M; SBB reg; SBI d8; SBB M; DAA; DAD rp; INR reg; INR M; DCR reg; DCR M; INX rp and DCX rp with examples.Logical instructions – ANA reg; ANI d8; ANA M; ORA reg; ORA M; ORI d8; XRA reg; XRI d8; XRA M; CMP reg; CPI d8; CMP M; CMA; STC; CMC; RLC; RRC;RAR and RAL with examples.

Branching and Machine control instructions- JMP addr16; J<condition> addr 16; CALL addr 16; C <condition> addr 16; RET; R <condition> ; RSt n; PCHL; DI; EI; SIM; RIM HLT and NOP with detailed descriptions - Assembler – Assembler Directive - Flow Charts – Assembly language program development tools – Program development algorithms

UNIT- III: ASSEMBLY LANGUAGE PROGRAMMING

Programme to transfer data between memory and accumulator – 1's and 2's complement of 8 bit data - Programme to add two 8 bit data –Subtract two 8 bit data – Subtract two BCD data – Binary to Gray – Gray to Binary conversion.

Programme to add two 16 bit data –Subtract two 16 bit data – Add two BCD data – add an array of datas - Programme to sort an array of data in Ascending and Descending order- Programme to multiply two numbers of 8 bit data - Programme to find the square root of a given binary number – Programme to search a smallest in the given array of data.

UNIT- IV: MEMORY INTERFACING AND INTERRUPTS

Interfacing SRAM and EPROM – Memory capacity – Choice of memory IC's and address allocation – Interfacing I/O devices and peripheral IC's — I/O device mapping (simple descriptions) - Needs for

interrupts – Types of interrupts —Polling of interrupts – Data transfer schemes – Synchronous data transfer scheme – Asynchronous data transfer scheme – Interrupt driven data transfer scheme - 8259 Programmable interrupt controller – 8255 peripheral interface-8257 DMA controller.

UNIT- V: APPLICATIONS OF MICROPROCESSOR

Temperature control system– Motor speed control system – Stepper motor control system – Traffic control system – Keyboard control system.

TEXT BOOK:

1.Author : A.Nagoorkani
Book Name: Microprocessor and its applications
Publication: RBA Publication, Chennai.
Year: 1999,
Edition: 1st

REFERENCE BOOK:

1.Author : A.P Mathur,

Book Name Introduction to Microprocessor

Publication: Tata Mc-GrawHill

Year: 2001

Edition: 3rd

2.Author : Ramesh Gaonkaer

Book Name: . Microprocessor and its Application

Publication: ,Penram Publication, Mumbai

Year: 1999

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH6C09

Course Title : **RELATIVITY, WAVE MECHANICS AND ASTROPHYSICS**

Core : 9

Year : III Semester : VI

5 Hours/Week 5 Credits

UNIT – I: RELATIVITY

Michelson-Morley Experiment - Gallilean Transformation and Newtonian Relativity - Inadequacy of Gallilean Transformation - Fundamental Postulates of Special Theory of Relativity - Lorentz Transformation Equations - Length Contraction and Time Dilation –Law of Addition of Velocity- Variation of Mass with Velocity -Equivalence of Mass and Energy.

UNIT – II: ORIGIN OF WAVE MECHANICS

De Broglie hypothesis – Concept of Phase Velocity – Concept of Group Velocity – Relation between group velocity and wave velocity – Experiments of Davisson and Germer and G.P. Thomson – Wave packet – Heisenberg uncertainity principle and its proof – Illustrations – Diffraction of electrons by a slit – Gamma ray microscope – Applications of uncertainity principle – Non-existence of electrons in the nucleus – Radius of Bohr's first orbit of hydrogen atom and energy of ground state.

UNIT – III: FORMULATION OF WAVE MECHANICS

Wave function for a free particle – Schrodinger's one dimensional wave equation – Time dependent and independent parts- Physical interpretation of wave function – Operators in quantum mechanics – Eigen functions – Eigen value – Eigen value equations – Postulates of quantum mechanics – Orthogonality of Eigen functions – Probability current density – Ehrenfest's theorem.

UNIT – IV: OPERATORS

Significance of various quantum numbers – n, l, m_l – Electron probability density – Commutation relations – Position and momentum, H and P, between the components of L, L^2 with L_x, L_y and L_z – Ladder operators L_+ and L_- - Particle in a box – Potential step – The barrier penetration problem – Linear harmonic oscillator.

UNIT –V: ASTRO PHYSICS

Solar system-Astronomical Instruments-Refracting telescope-Reflecting telescope-Radio telescope measurement of distance-Size-Rotation – Mass of the sun-Surface temperature – Atmosphere -Planets-Asteroids – Comets -Meteorites-Sun - Star- Physical Properties of Stars-Masses of stars-Stellar Evolution-Milky Way Galaxy – Expanding Universe- Big-bang theory.

TEXT BOOK

1. Author: Murugesan. R

Book Name: Modern physics

Publication: S.Chand & co.,

Year: 2007

Edition: 13th

2.Author : Swati Saluja, Sathya Prakash

Book Name: Quantum mechanics

Publication:kedar Nath , Ram Nath and co

Year: 2005

Edition: Ist

3.Author : Brijlal Subramaniam
Book Name: Properties of matter
Publication: S.Chand & co.,
Year: 1991
Edition: 6th

REFERENCE BOOK:

1.Author : G. Arul dass

Book Name: Quantum mechanics

Publication: Prentice-hall of India, Pvt

Year: 2004

Edition: 3rd Printing

2.Author : Guptha kumar sharma

Book Name: Quantum mechanics

Publication: Jai prakash ovath and co

Year: 2005

Edition:25th

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH6C10
Course Title : **SOLID STATE PHYSICS**
Core : 10
Year : III Semester : VI
5 Hours/Week 5 Credits

UNIT – I: CRYSTAL STRUCTURE

Elements of Crystal Structure - X ray Diffraction - Bragg's Law - Miller Indices - Simple Crystal Structures - Calculation of number of atoms per unit cell – Atomic radius – co-ordination number – Packing factor for SC,BCC,FCC and HCP structures – Rotating crystal method - Powder Photograph method – determination of unit cell dimensions. Crystal imperfections**:** Point defects – line defects –Surface defects – Volume defects.

UNIT – II: ELECTRON THEORY OF SOLIDS

Electrical conduction classification of conducting materials – Drude Lorentz theory – Expression for electrical conductivity – Thermal conductivity – Expression for thermal conductivity – Wiedemann – Franz law – electrical resistivity versus temperature- schottky effect- photoelectric effect – photoelectric emission-free electron gas in three dimensions- periodic boundary conditions- The Fermi Energy failure of the free electron model.

UNIT – III: DIELECTRIC MATERIALS

Dielectric polarization -Dielectric constant and displacement vector - Different types of dielectric polarization – Frequency and temperature effects on polarization – Dielectric loss – Dielectric break down – local fields – Clausius Mossotti relation.- Piezoelectric effect- properties of ferroelectrics.

UNIT – IV: SUPERCONDUCTORS

Super conductivity phenomena – Effect of magnetic field - Properties of Superconductors – Type I and Type II Superconductors -Meissner effect – High Tc Superconductors -SQUIDS. Isotope effect -Thermodynamic effects (Entrophy, Specific heat, Thermal conductivity) – Application of superconductors (Electric generators, Electric power transmission line, Magnetic levitation

UNIT – V: TYPES OF BONDING AND NEW MATERIALS

Types of bonding- Ionic bond- characteristics of ionic bond- Covalent bond – characteristics of covalent bond – Metallic bond – characteristics of metallic bond- Vander waals bonding - New materials: Metallic glasses - Fiber Reinforced Plastics (FRP) and Fiber Reinforced Metals (FRM) –

Surface Acoustic Wave materials- applications (Delay lines and memories, frequency filter, surface acoustic wave resonator) - Metal matrix composites – Biomaterials – Ceramics – Shape memory alloys – SMART materials – conducting polymers.

TEXT BOOK:

1.Author : S. L. Gupta & V. Kumar,
Book Name:Solid state Physics
Publication: K.Nath & Co,Meerut
Year:1984
Edition: 4th

2. Author : Dr. M. Arumugam
Book Name: Material Science
Publication: Anuradha Agencies
Edition: Revised 3, UNIT –V

REFERENCE BOOK:

1 Author : S.O. Pillai
Book Name: Solid State Physics

Publication: New Age International Publishers
Year:2002
Edition: Revised 6th UNIT – I to IV
2. Author: Saxena Gupta Saxena
Book Name : Solid State Physics
Publication : Pragathi
Year : 2010
Edition : 14

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH6C11

Course Title : **NUCLEAR PHYSICS**

Core : 11

Year : III Semester: VI

5 Hours/Week 5 Credits

UNIT – I: RADIO ACTIVITY

Radio activity - Fundamental laws of Radio activity - Laws of Radioactive disintegration - Half life - Mean life - Laws of Successive disintegration – Radioactive dating – The age of earth – radioactive series – Alpha emission – properties of alpha particles – alpha spectrum – Geiger Nuttal law – Beta decay – Properties of Beta decay – Gamma ray spectrum – Determination of the wavelength of gamma rays.

UNIT – II: NUCLEAR ACCELERATORS AND DETECTORS

Linear accelerator (LINAC) – Betatron – Synchroton – Proton Synchroton – Ionization chamber – GM counter – Wilson's cloud chamber – Bubble chamber – Spark chamber - Scintillation counter – Cerenkov counter

UNIT- III: NUCLEAR PROPERTIES AND MODELS

Classification of nuclei - General properties of nucleus – Binding energy – Nuclear stability - Theories of nuclear composition – Nuclear forces - Proton-electron hypothesis – Proton-neutron hypothesis – Models of nuclear structure – The Liquid drop model – The Shell model – The Collective model.

UNIT – IV: NUCLEAR REACTIONS

The Discovery of artificial transmutation – The Q-value equation for a Nuclear reaction – Types of nuclear reactions – Energy balance in nuclear reactions and the Q-value – Threshold energy of an endoergic reaction – Nuclear fission – critical mass – chain reaction – Nuclear fusion – source of stellar energy - Transuranic elements.

UNIT- V: COSMIC RAYS AND ELEMENTARY PARTICLES

Discovery of cosmic rays – latitude effect – Azimuth effect – Altitude effect – Primary and Secondary cosmic rays – cosmic ray showers – Discovery of positron – the mesons – Van allen belts.

Elementary Particles: Classification – Particles and anti particles – the fundamental interactions.

TEXT BOOK:

1.Author : Murugesan. R

Book Name: Modern physics

Publication: S.Chand & co.,

Year: 2007

Edition: 13th

REFERENCE BOOK:

1.Author : Pandiya and Yadav ,

Book Name: Elements of Nuclear Physics

Publication: Kedar Nath , Ram Nath, Meerut

Year: 1997

Edition:7th

2. Author : D. C. Tayal,

Book Name: Nuclear Physics

Publication: Himalaya Publishing ,

Year: 2003

Edition: 9th

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: **18UPH6C12**

Course Title : **PROGRAMMING IN C AND ITS PHYSICS APPLICATIONS**

Core : 12

Year : III Semester : VI

5 Hours/Week 5 Credits

UNIT – I: C LANGUAGE FUNDAMENTALS

History of C language - Basic Structure of C Programming - Character set - Constants - Variables - Data Types - Operators and Expression - Escape Sequence Characters -Library Functions - Input and Output statements: scanf - printf - getchar - putchar - gets – puts.

UNIT – II: CONTROL STRUCTURES

Arrays Variables – Assigning Data for Array - One, Two and Multi dimensional Array - Conditional control statement: if, else, nested if, switch case - Looping statement: while, do while, for, nested for- break - continue and Unconditional control statement: go..to statement.

UNIT – III: FUNCTIONS, STRUCTURE AND UNIONS

Function declaration – argument – Call the function – Return statement - Type of functions - Recursive functions - Passing Array to functions - Automatic, Static, Register and External storage - Defining a structure – Declaring structure variables – Accessing structure members – Structure initialization – Structure within structures – Structures and functions – Unions – Size of structures.

UNIT – IV: POINTERS AND FILES

Understanding pointers – Accessing the address of a variable – Declaring pointer variables – Initialization of pointer variables – Accessing a variable through its pointer – Pointer expressions

Defining and opening a file – Closing a file - Input/output operation in files – Error handling during I/O operations – Command line arguments.

UNIT - V: PHYSICS APPLICATION PROGRAMMS

Quadratic equations - Matrix multiplication - Conversion of temperature from C to F and F to C - Determination of G by Boy's Method - Young's Modulus - Uniform bending - Spectrometer - Refractive index & Dispersive power of prism - Newton's Rings - Radius of curvature - Determination of Velocity of light - Foucault's Rotating Mirror Method - Estimation of Average Global Solar Radiation

BOOK FOR STUDY:

1. A textbook on C by E. Karthikeyan
   Publication: Prince–Hall of India Pvt Ltd, New Delhi
   Year: 2008.1st edition

BOOKS FOR REFERENCE:

1. Programming in ANSI C by E. Balagurusamy
   3rd edition Tata Mc Graw Hill Publishing Company Limited, 2004
2. Let us C by Yeshavant Kanitkar
   4th edition, BPB publications, 2002

SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS) COIMBATORE -641 020

For candidates admitted from academic year 2018-19 onwards Under New CBCS

Programme : B. Sc Physics Subject Code: 18UPH6EL1
Course Title : **ALTERNATE ENERGY RESOURCES**
Elective : I
Year : III Semester: VI 2 Hours/Week 4 Credits

UNIT – I: INTRODUCTION

Introduction – Consumption pattern – Oil shock – Types based on usage –Usage pattern of primary energy sources – Necessity of harnessing alternate energy resources – Energy chain –Energy and its major classifications.

UNIT – II: ENERGY CRISIS

Salient features and drawbacks of energy sources in practice- Alternate energy sources and their significances- Energy and its influence on environment -Heating values of various fuels – Energy status – Global context –Indian context

UNIT – III: THERMAL CONVERSION

Principles of Solar thermal conversion - Solar collectors - Solar water heater- Solar passive space heating and cooling systems - Solar industrial heating systems - Solar cookers – Solar furnaces- Solar green house - Solar desalination - Solar pumping – Satellite solar power stations

UNIT – IV: BIOMASS ENERGY

Introduction - Photosynthesis - Bio-gas generation - Digesters and their design - Some materials for biogas and biomass - Advantages and disadvantages of biological conversion of solar energy applications of biogas.

UNIT – V: FUEL CELL AND PHOTOVOLTAICS

Introduction to fuel cell – Potential applications – Classifications – Phosphoric acid fuel cell (PAFC) – Alkane fuel cell (AFC) – Fuel cell power plot- Magneto hydro dynamic (MHD) power conversion – Principle MZHD generator – Advantages – Limitations.

Photovoltaics : Introduction to photovoltaics – Photovoltaic effect – Photovoltaic cell – Photovoltaic system for power generation – Applications of photovoltaic system.

TEXT BOOK:1

1. B.H. KHAN – Non-conventional Energy Resources, Tata Mc Graw-Hill Publishing Company Ltd, 2006.
2. G.D. RAI – Solar Energy Utilization, Khanna Publishers, 1995.
3. S.P. SUKHATME - solar energy – Principles of thermal collection and storage- 2nd edition./ Tata Mc-Hill –coy 2006