VIVEKANANDHA

COLLEGE OF ARTS AND SCIENCES FOR WOMEN

ELAYAMPALAYAM, TIRUCHENGODE (Tk.), NAMAKKAL (Dt.).
(Affiliated to Periyar University, Approved by AICTE & Accredited by NAAC)

DEPARTMENT OF PHYSICS

I & II-B.Sc., PHYSICS
SYLLABUS & REGULATIONS

FOR CANDIDATES ADMITTED FROM 2018 - 2019
ONWARDS UNDER AUTONOMOUS - OBE PATTERN

VIVEKANANDHA EDUCATIONAL INSTITUTIONS
Angammal Educational Trust
Elayampalayam, Tiruchengode (Tk.), Namakkal (Dt.)

AUTONOMOUS

About the College

Vivekanandha College of Arts and Sciences for Women (Autonomous) was established and hailed into Women's Educational Service in the Year 1995. Angammal Educational Trust Chaired by the great Educationalist 'VidhyaRathna' Prof.Dr. M. KARUNANITHI, B.Pharm., M.S., Ph.D., D.Litt., sponsors this college and other institutions under the name of the great Saint Vivekanandha. Our institutions are situated on either side of TiruchengodeNamakkal Main Road at Elayampalayam, 6 kms away from Tiruchengode. This is biggest women's college in India with more than 7500 girl students and more than 18 departments. The strength of the college was just 65 at the time of its establishment. With the dedication, work, sacrifice and long vision of the chairman, this institution has grown into a Himalaya stage. As a result of which UGC, New Delhi, awarded 2f and 12b, extended Autonomous status for second cycle. The National Assessment and Accreditation Council reaccredited with grade 'A' for its successful performance.

As an Autonomous Institution, academic professionals of the college framed Curriculum and Syllabi in consultation with all its stakeholders to cater the needs of the young women to fulfil the women empowerment and present Industrial needs to the local benefits. The students are empowering with confidence and required skills to face the society.

Quality Policy

To provide professional training by establishing a high level centre of learning that provides quality education at par with the international standards and Provide excellence education with well equipped infrastructure to all the rural women.

Our Vision

To be an academic institution exclusively for women, in dynamic equilibrium with the social and economic environment, strive continuously for excellence in education, research and technological service to the nation.

Our Mission

The mission of our institution is to discover, teach and apply knowledge for the intellectual, cultural, ethical, social and economic growth of women students.

6	English – IV: Foundation English - IV	
7	Core–IV:Mechanics	
8	Core Practical - II	
9	Allied Chemistry - II	
10	Allied Chemistry Practical - I	
11	SBEC – II: Energy Physics	
12	NMEC – II: Industrial Chemistry - II	
SYLLABUS FOR YEAR III (Semester V)		
1	COURSE PATTERN WITH PAPERS	
2	Core – V: Electricity and Magnetism	
3	Core – VI:Basic Electronics	
4	Core - VII: Solid State Physics	
5	Elective – I: Quantum Mechanics and Relativity	
6	SBEC – III: Digital Electronics	
7	SBEC – IV:Bio Medical Instrumentation	
8	Core Practical – III	
9	Core Practical –IV	
SYLLABUS FOR YEAR III (Semester VI)		
1	COURSE PATTERN WITH PAPERS	
2	Core - VIII: Atomic Physics	
3	Core - IX:Nuclear Physics	
4	Elective – II: Electronics and Communication	
5	Elective – III:Numerical Methods	
6	SBEC – V:Microprocessor and its Application	
7	SBEC – VI: Electrical Appliances	
8	Core Practical –III	
9	Core Practical –IV	

CURRICULUM STRUCTURE – UG – ODD SEMESTER 2019-2020

BATCH: 2019 - 2022								
Sem	**Subject Code**	**Part**	**Subject Title**	**Hours**	**Credit**	**Marks**		
						Int. Marks	**Ext. Marks**	**Total Marks**
I	18U1LT01 18U1LH01 18U1LM01	I	Tamil – I Hindi – I Malayalam – I	5	3	25	75	100
	18U1LE01B	II	English – I	6	3	25	75	100
	18U1PHC01	III	**Core–I:** Properties of Matter and Acoustics	5	5	25	75	100
	18U1MAA01	III	**Allied-I:**Allied Mathematics – I	5	4	25	75	100
	18U2MAAP01	III	Allied Mathematics Practical	3	3	-	-	-
	18U2PHCP01	III	Major Practical – I	4	4	-	-	-
	18U1VE01	IV	Value Education - YOGA	2	2	25	75	100
	TOTAL			**30**	**24**	**125**	**375**	**500**

CURRICULUM STRUCTURE – UG – EVEN SEMESTER 2019-2020

BATCH: 2019 - 2022								
Sem	**Subject Code**	**Part**	**Subject Title**	**Hours**	**Credit**	**Marks**		
						Int. Marks	**Ext. Marks**	**Total Marks**
II	18U2LT02 18U2LH02 18U2LM02	I	Tamil – II Hindi – II Malayalam – II	5	3	25	75	100
	18U2LE02	II	English – II	5	3	25	75	100
	18U2PHC02	III	**Core–II:**Heat and Thermodynamics	5	5	25	75	100
	18U1MAA02	III	**Allied-I:** Allied Mathematics – II	4	4	25	75	100
	18U2MAAP01	III	Allied Mathematics Practical	3	3	25	75	100
	18U2PHCP01	III	Major Practical – I	4	4	25	75	100
	18U2ES01	IV	Environmental Studies	4	4	25	75	100
	TOTAL			**30**	**26**	**175**	**525**	**700**

BATCH: 2018 – 2021								
Sem	**Subject Code**	**Part**	**Subject Title**	**Hours**	**Credit**	**Marks**		
III	18U3LT03 18U3LH03 18U3LM03	I	Tamil – III Hindi – III Malayalam – III	5	3	25	75	100
	18U3LE03B	II	English – III	6	3	25	75	100
	18U3PHC03	III	**CORE–III**: Optics	5	5	25	75	100
	18U3CHA01	III	**ALLIED:** Allied Chemistry - I	4	4	25	75	100
	18U3PHS01	IV	**SBEC - I:** Laser Technology	2	2	25	75	100
	18U4PHCP02	III	Major Practical – II	3	4	-	-	-
	18U4CHAP01	III	Allied Chemistry Practical	3	3	-	-	-
	18U3CHN01	IV	**NMEC–I:** Industrial Chemistry-I	2	2	25	75	100
	TOTAL			**30**	**26**	**150**	**450**	**600**

BATCH: 2018 – 2021								
Sem	**Subject Code**	**Part**	**Subject Title**	**Hours**	**Credit**	**Marks**		
IV	18U4LT04 18U4LH04 18U4LM04	I	Tamil – IV Hindi – IV Malayalam – IV	5	3	25	75	100
	18U4LE04B	II	English – IV	6	3	25	75	100
	18U4PHC04	III	**CORE – IV**: Mechanics	5	5	25	75	100
	18U4CHA02	III	**ALLIED:** Allied Chemistry - II	4	4	25	75	100
	18U4PHS02	IV	**SBEC-II:** Energy Physics	2	2	25	75	100
	18U4PHCP02	III	Major Practical – II	3	4	25	75	100
	18U4CHAP01	III	Allied Chemistry Practical	3	3	25	75	100
	18U3CHN02	IV	**NMEC–I:** Industrial Chemistry-II	2	2	25	75	100
	TOTAL			**30**	**26**	**200**	**600**	**800**

REGULATIONS

I. SCOPE OF THE COURSE

B.Sc. (Physics),the recent developments in Physical sciences, has been included in the enriched syllabus to meet out the present day needs of academic and research, institutions and industries**.** The program expects a serious commitment of the student to take up challenging study schedules and assignments. The course involves a blend of theoretical education and practical training which run concurrently for a period of three years and equips a student with knowledge, ability, skills and other qualities required for a professional accountant.

The uniqueness of the program is its content and topic coverage, the teaching methodology and the faculty. The syllabus has been designed at a level equal to that of professional courses. The teaching methodologies include classroom lectures, industrial visits, orientation, internship, case study and research work. Focus is also on developing soft skills of the students. For Core subjects, Outsource Guest Lectures by Industrialists and Professional Men will be arranged to enable the students to get wider exposure.

II. SALIENT FEATURES

- ✓ Course is specially designed for a higher level Career Placement.
- ✓ Special Guest lectures from Industrialists will be arranged.
- ✓ Exclusively caters to students interested in pursuing higher studies.
- ✓ Special Industry Orientations and Training are parts of the Degree Course.
- ✓ Project work is included in the syllabus to enhance conceptual, analytical & deductive skills.

III. OBJECTIVES OF THE COURSE

- ✓ The new syllabus throws light on the recent and emerging areas of Physics.

- ✓ Enable the students understand Physics and make them more relevant to the society.
- ✓ Develop the analytical ability in students so that they are become objective in solving problems.
- ✓ Help the students learn practical skills in a better way.
- ✓ Inculcate research aptitude in students.
- ✓ Enable the students to go to higher levels of learning Physics.
- ✓ Improve the employability of the students.
- ✓ To inspire the students to apply their knowledge gained for the development of society in general.

IV. ELIGIBILITY FOR ADMISSION

Candidates seeking admission to the first year Degree course (B.Sc. Physics) shall be required to have passed Higher Secondary Examination with Physics as one of the Subjects conducted by the Government of Tamil Nadu.

V. DURATION OF THE COURSE

- ✓ The course shall extend over a period of three academic years consisting of six semesters. Each academic year will be divided into two semesters. The First semester will consist of the period from July to November and the Second semester from December to March.
- ✓ The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Vivekanandha College of Arts and Sciences for Women with the approval of Periyar University.
- ✓ Each subject will have six hours of lecture per week apart from practical training at the end of each semester.

VI. CONTINUOUS INTERNAL ASSESSMENT

The performance of the students will be assessed continuously and the Internal Assessment Marks will be as under:

1. Average of three Test - 15 Marks
2. Assignment - 5 Marks
3. Attendance - 5 Marks

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Total = 25 Marks

……

The distribution of attendance marks is given as follows,

76-80 % - 1 Mark

81-85 % - 2 Marks

86-90 % - 3 Marks

91-95 % - 4 Marks

96-100 % - 5 Marks

VII. Question Paper Pattern:

Question Paper Pattern for the examinations

Time: 3 Hours **Maximum Marks: 75**

Part A: Answer all of the following (choose the best answer) (20 x 1 = 20 Marks)

Part B: Answer all questions (Either or type) (5 x 5 = 25 Marks)

Part C: Answer any three of the following questions (3 x 10 = 30 Marks)

VIII. PASSING MINIMUM

In the University Examinations, the passing minimum shall be 40 % out of 75 Marks for theory (30 marks) and 40% out of 60 marks for practical. (24 Marks).

IX. ELIGIBILITY FOR EXAMINATION

A candidate will be permitted to appear for the University Examination only on earning 75 % of attendance and only when her conduct has been satisfactory. It shall be open to grant exemption to a candidate for valid reasons subject to conditions prescribed.

X. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Successful candidates passing the examination of Core Courses (main and allied subjects) and securing marks

a) 75 % and above shall be declared to have passed the examination in first class with Distinction provided they pass all the examinations prescribed for the course at first appearance itself.
b) 60% and above but below 75 % shall be declared to have passed the examinations in first class without Distinction.
c) 50%and above but below 60% shall be declared to have passed the examinations in second class.

d) All the remaining successful candidates shall be declared to have passed the examinations in third class.
e) Candidates who pass all the examinations prescribed for the course at the first appearance itself and within a period of three consecutive academic years from the year of admission only will be eligible for University rank.

XI. COMMENCEMENT OF THESE REGULATIONS

These regulations shall take effect from the academic year 2018 - 2019 (i.e.,) for the students who are to be admitted to the first year of the course during the academic year 2018 - 2019 and thereafter.

XII.COURSE PATTERN

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN

(AUTONOMOUS)

SYLLABUS FRAME WORK 2018 – 2019 Onwards

Subjects	Inst. Hour/Week		Exam ours	Internal	External	Total Marks	Subjects	Inst. Hour/Week	Credit	Exam ours	Internal	External	Total Marks
YEAR I													
Semester I							**Semester II**						
Language I	6	3	3	25	75	100	Language II	6	3	3	25	75	100
English I	6	3	3	25	75	100	English II	6	3	3	25	75	100
Core I	5	5	3	25	75	100	Core II	5	5	3	25	75	100
Core I Practical	3	0	3	40	60	100	Core I Practical	3	3	3	40	60	100
Allied I	5	3	3	25	75	100	Allied II	5	3	3	25	75	100
Allied I Practical	3	0	3	40	60	100	Allied I Practical	3	4	3	40	60	100
Valued Added Course	2	2	3	25	75	100	Valued Added Course	2	2	3	25	75	100
Total	**30**	**16**	**21**	**205**	**495**	**700**	**Total**	**30**	**23**	**21**	**205**	**495**	**700**
I Y EAR TOTAL									**39**	**42**	**410**	**990**	**1400**
YEAR II													
Semester III							**Semester IV**						
Language III	6	3	3	25	75	100	Language IV	6	3	3	25	75	100
English III	6	3	3	25	75	100	English IV	6	3	3	25	75	100
Core III	4	5	3	25	75	100	Core IV	4	5	3	25	75	100
Core II Practical	3	0	3	40	60	100	Core II Practical	3	3	3	40	60	100
Allied III	4	3	3	25	75	100	Allied IV	4	3	3	25	75	100
Allied II Practical	3	0	3	40	60	100	Allied II Practical	3	3	3	40	60	100
SBEC I	2	2	3	25	75	100	SBEC II	2	2	3	25	75	100
NMEC I	2	3	3	25	75	100	NMEC II	2	3	3	25	75	100
Total	**30**	**19**	**24**	**230**	**570**	**800**	**Total**	**30**	**25**	**24**	**230**	**570**	**800**
II YEAR TOTAL									**83**	**9**	**870**	**2130**	**300**

YEAR III													
Semester V							**Semester VI**						
Core V	5	5	3	25	75	100	Core VIII	5	5	3	25	75	100
Core VI	5	5	3	25	75	100	Core IX	5	5	3	25	75	100
Core III Practical	3	0	3	40	60	100	Core III Practical	3	4	3	40	60	100
Core IV Practical	3	0	3	40	60	100	Core IV Practical	3	4	3	40	60	100
Core VII	5	5	3	25	75	100	Core X	5	5	3	25	75	100
Elective I	5	5	3	25	75	100	Elective II	5	5	3	25	75	100
SBEC III	2	2	3	25	75	100	SBEC V	2	2	3	25	75	100
SBEC IV	2	2	3	25	75	100	SBEC VI	2	2	3	25	75	100
							Extension work	0	1	0	0	0	100
Total	**30**	**24**	**24**	**230**	**570**	**800**	**Total**	**30**	**33**	**24**	**230**	**570**	**900**
TOTAL CREDIT FOR THE COURSE									**140**	**138**	**1330**	**3270**	**4700**

LIST OF CORE PAPERS:

S.No	Course code	Course title
1.	18U1PHC01	Properties of Matter and Acoustics
2.	18U2PHC02	Heat and Thermodynamics
3.	18U3PHC03	Optics
4.	18U4PHC04	Mechanics
5.	18U5PHC05	Electricity and Magnetism
6.	18U5PHC06	Basic Electronics
7.	18U5PHC07	Solid State Physics
8.	18U6PHC08	Atomic Physics
9.	18U6PHC08	Nuclear Physics

XIII. LIST OF ELECTIVES

S.No	Course code	Course title
1.	18U5PHE01	Quantum Mechanics and Relativity
2.	18U6PHE02	Electronics and Communication
3.	18U6PHE03	Numerical Methods
4.	18U6PHE04	Nanoscience
5.	18U6PHE05	Astrophysics
6.	18U6PHE06	Mathematical Physics

LIST OF SKILL BASED ELECTIVES

S.No	Course code	Course title
1.	18U3PHS01	Laser Technology
2.	18U4PHS02	Energy Physics
3.	18U5PHS03	Digital Electronics
4.	18U5PHS04	Biomedical Instrumentation
5.	18U6PHS05	Microprocessor and its Application
6.	18U6PHS06	Electrical Appliances

XV. NON MAJOR ELECTIVE COURSE

S.No	Code	Course Title
1	18U3PHN01	Essentials of Electricity
2	18U4PHN02	Physics in Everyday Life

XVI. ALLIED PHYSICS

S.No	Course Code	Course Title
1	18U1PHA01	Allied Physics – I
2	18U2PHA02	Allied Physics - II

Distribution of Duration and Credit under Different Papers

Part	Paper	Hours/Week	Weeks/Semes	Hour/Paper	No. of Papers	Credit/Paper	Total Hours	Total credit
I	**Language**	4	15	60	4	3	240	12
II	**English**	4	15	60	4	3	240	12
III	**Core paper**	5	15	75	9	5	675	45
III	**Core practical**	3	15	45	4	3/4	180	14
III	**Allied**	5	15	75	4	3	300	12
III	**Allied practical**	6	15	90	2	3	180	6
IV	**Value Education**	4	15	60	2	2/4	120	6
IV	**SBEC**	2	15	30	6	2	180	12
III	**Elective**	3	15	60	2	5/4	120	14
IV	**NMEC**	2	15	30	2	3	60	6
IV	**Extension work**	1	15	15	1	1	15	1
TOTAL								**140**

SEMESTER - I

Programme Code	B.Sc	Programme title	Bachelor of Science (Physics)	
Course Code	18U1PHC01	Title	Batch	2018- 2021
Hrs/Week	5	CORE - I: PROPERTIES OF MATTER AND ACOUSTICS	Semester	I
			Credits	5

Course Objectives

1. Students will get information to analyze the properties of a mystery substance to determine its state of matter

2. Acquire basic knowledge of properties of matter such as elasticity, Surface tension, Viscosity etc.

Knowledge Level	CO Number	CO Statement
K1	CO1	To learn the basic concept of rigid body dynamic, gravitation and acoustics.
K2	CO2	To understand the moment of inertia, radius of gyration, elasticity, surface tension and classification of vibration.
K3	CO3	To understand the principle of low pressure and their measurements.
K4	CO4	To understand the applications of elasticity and acoustics.
K5	CO5	To apply the basic concepts in real world problems.

UNIT – I: Elasticity **12**

Stress-strain diagram-Different moduli of Elasticity-work done per unit volume in shearing strain-Relation between Elastic moduli-Poisson's ratio-Twisting couple on a wire-work done in twisting-Torsional pendulum-

determination of rigidity modulus-static torsion method with scale and telescope-Torsional oscillation of a body–Rigidity modulus by torsion pendulum with mass.

UNIT – II: Bending Of Beams **12**

Expression for bending moment-Depression of the loaded end of the cantilever-Uniform-Nonuniform bending - theory-experiment pin and microscope and scale and telescope method-Work done in uniform bending-Searle's method-Koenig's method.

UNIT – III: Surface Tension **12**

Definition and dimensions of surface tension-Angle of contact and its determination- formation of drops- excess pressure inside the soap bubble - excess pressure inside the curved liquid surface- Experiment study of variation of surface tension with temperature-drop weight method of determining surface tension and interfacial surface tension –Quincke's method-angle of contact of mercury.

UNIT – IV: Viscosity **12**

Coefficient of critical velocity-Poiseuille's formula coefficient of viscosity-correction for the formula-determination of co-efficient of viscosity by capillary flow method-comparison of viscosities –Oswald's viscometer-Stoke's method for the coefficient of a highly viscous liquid-variation of viscosity with temperature and pressure-viscosity of gases-Mayer's formula for the rate of flow of a gas through a capillary tube.

UNIT – V: Sound and Acoustics **12**

Intoduction- propagation of wave motion- mode of propagation-Frequency, Wavelength & velocity of sound waves-Sonometer-determination of frequency - Melde's apparatus – transverse and longitudinal waves.

Acoustics of buildings - reverberation time- derivation of Sabine's formula-determination of absorption Coefficient.

Power point presentation, Seminar, Quiz, Assignment

Books for Study:

1. Elements of properties of matter by D.SMathur.,S.Chand and co.,, 10th edition,(1984)
2. Properties of Matter by R.Murugesan., S.Chand and co.,(2004).
3. Properties of Matter by Brijlal&N.Subramaniam., S.Chand and co.,(2005).
4. Properties of Matter and Acoustics by R.Murugesan., S.Chand and co.,(2005).
5. A Text Book of Sound by N.Subramaniam and Brijlal., S.Chand and co.(2004).

Books for Reference:

1. Fundamentals of General Properties of Matter, H.R.Gulati, S.Chand and co., (2005).
2. A Text Book of Sound, R.L.Saighal, S.Chand and co., (2005).
3. Acoustics, Waves and Oscillations, S. N. Sen, New Academic Science, (2013).

ONLINE SOURCES:

1. www.khanacademy.org/science/physics/elasticity/surface tension
2. www.khanacademy.org/science/physics/viscosity/acoustics

PSO / CO	PS01	PS02	PS03	PS04	PS05
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

SEMESTER - II

Programme Code	B.Sc.,	**Programme Title**	**Bachelor of Science (Physics)**	
Course Code	18U2PHC02	**Title**	**Batch**	2018-2021
		CORE – II: HEAT AND THERMODYNAMICS	**Semester**	II
Hrs/Week	5		**Credits**	5

Course Objective

To enable the students in order to learn the basic principles and concepts of Heat and Thermodynamics

Course Outcomes (CO)

Knowledge Level	**CO Number**	**CO Statement**
K1	CO1	Understand the concepts of Thermometry and Calorimetry.
K2	CO2	Procure basic knowledge about law of thermodynamics and Entropy.
K3	CO3	Understand the basics concepts of Low Temperature Physics.
K4	CO4	Get ideas about transmission of Heat.
K5	CO5	Acquire knowledge in classical and Quantum Statistics.

Unit I: Thermometry and Calorimetry **12**

Platinum resistance thermometer, correction, disadvantages, definition of specific heat capacity, determination of specific heat capacity by Newton's law of cooling, two specific heat capacities of gas, determination of C_v by Joly's differential steam calorimeter, determination of C_p by Regnault's method.

Unit II: Thermodynamics **10**

Zeroth and first law of thermodynamics- reversible and irreversible processes- second law of thermodynamics-m Carnot's engine- efficiency

Entropy-change of entropy in reversible and irreversible processes-temperature – entropy diagrams – third law of thermodynamics- Maxwel's thermodynamic relations

Unit III: Low Temperature Physics **14**

Joule – Thompson effect- porous plug experiment- liquefaction of gases. Helium I & II – adiabatic demagnetization – superconductivity – refrigerator.

Unit IV: Transmission of Heat **14**

Definition – conduction, convection and radiation - thermal conductivity - Lee's disc method – lapse rate – stability of the atmosphere- Greenhouse effect - Radiation - black body radiation – Wein's law – Raleigh Jean's law – Planck's law – Stefan's law – pyrometry – solar constant – Angstrom pyrheliometer - water flow pyrheliometer

Unit V: Statistical Thermodynamics **10**

Bose-Einstein Distribution law-Fermi-Dirac Distribution Law-Energy relations. Helmholtz function, Gibb's function, enthalpy, Tds equation, Clausis-Clapeyron latent heat equation, specific heat relation.

Power point Presentations, Seminar ,Quiz, Assignment

Books for Study:

1. Heat and Thermodynamics, Brij Lal and Subramaniam, S. Chand and Co (2004).
2. Heat and Thermodynamics, D.S. Mathur, S. Chand and Co (2004).
3. Thermal physics, R. Murugesan, S.Chand and Co
4. University Physics, Richard Wolfson, Addison- Wesley

Books for References:

1. Heat and Thermodynamics, Brij Lal and Subramaniam, &P.S.Hemne (2007), Revised and Multicolour Edition.
2. 2 Mathur D.S Heat and Thermodynamics S. Chand & Company 2008, 5th Edition.

3. Sharma J.K &Sarkar K.KThermodynamics andStatistical PhysicsHimalayaPublishing House (1991), 3rd Edition

ONLINE SOURCES:

1. https://www.khanacademy.org/science/physics/thermodynamics
2. https://www.khanacademy.org/science/physics/thermodynamics/laws-ofthermodynamics/v/macrostates-and-microstates

Mapping with Programme outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

SEMESTER – III

Programme Code	B.Sc.,	**Programme Title**	**Bachelor of Science (Physics)**	
Course Code	18U3PHC03	**Title**	**Batch**	2018 – 2021
Hrs/Week	5	**CORE - III: OPTICS**	**Semester**	III
			Credits	5

Course Objectives

1. The aim of the course is to introduce the students to the optics.
2. Acquire basic knowledge of the optical instrument, propagation of light, nature and behavior of light and its application etc.

Course Outcomes

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

Knowledge Level	**CO Number**	**CO Statement**
K1	CO1	To understand the fundamental principles of geometrical optics.
K2	CO2	To learn the diffraction of light with plane grating.
K3	CO3	To understand the interference of light.
K4	CO4	To understand the polarization of light using prisms.
K5	CO5	To learn the optical instruments using basic principles and their applications.

UNIT – I: Geometrical Optics **12**

Characteristic of Light – Reflection – Refraction - Dispersion through a prism – Dispersive power - Combination of two small angled prisms to produce dispersion without deviation – Constant Deviation Spectrometer - Deviation without dispersion – Direct vision Spectrometer - Spherical aberration in lenses – Methods of minimizing spherical aberration – Condition for minimum spherical

aberration in the case of two lenses separated by a distance – Chromatic aberration in lenses – Condition for achromtism of two thin lenses (in contact and out of contact) – Coma.

UNIT – II: Diffraction **12**

Diffraction – Coherence - Phase difference and Path difference – Fresnel &Fraunhofer diffraction - Rectilinear Propagation of light – Zone plate - Fraunhoferdiffraction at a single slit - Theory of plane transmission grating - Normal incidence and oblique incidence - Condition for absence of spectra - Overlapping spectra - Grating at oblique incidence - Diffraction due to straight edge - Prism and grating spectra - Dispersive power of grating - Detrermination of wavelength of light using transmission grating.

UNIT - III:Interference **12**

Interference - Superposition of waves – Young's double slit experiment – Wave front divisions – Condition for interference – Techniques for obtaining interference Fresnel's biprism - Determination of wave length of monochromatic light - Michelson Interferometer - Fabryperot interferometer.

UNIT – IV: Polarization **12**

Polarization - Transverse wave - Double refraction - Ordinary ray and extra ordinary ray - Huygens explanation in uniaxial crystals - Quarter wave plate & Half wave plate - Production and detection of Plane, circularly, Elliptically polarized light - Babinets Compensator - Nicol prism -Optical Activity - Specific rotation - Laurent's half shade polarimeter.

UNIT – V: Optical Instruments **12**

Eye pieces - Huygens and Ramsens - Comparison - Resolving Power - Rayleigh's Criterion – Resolving power of Telescope, Microscope, Grating and Prism – Holography – Principle - Recording and Reconstruction - Properties - Applications.

Power point presentation, Seminar, Quiz, Assignment.

Book for Study:

1. A Text book of Optics – Subramanyam, Brij Lal and Avadhanulu – S. Chand & Co., New Delhi (2007).
2. Optics and Spectroscopy R. Murugesan and KiruthigaSivaprasath, S.Chand& Co., New Delhi (2006).

Book for Reference:

1. Optics by Ghatak.A, Tata McGraw Hill, New Delhi, 2009.

2. Optics - Eugene Hecht, Fourth Edition, Pearson Education, New Delhi,2007.

ONLINE SOURCES:

1. https://www.khanacademy.org/science/physics/geometric-optics
2. http://nptel.ac.in/cources

Mapping with Programme outcomes

PO / CO	P01	P02	P03	P04	P05
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S- Strong; M-Medium; L-Low

SEMESTER - IV

Programme Code	**B.Sc.,**	**Programme Title**	**Bachelor of Science (Physics)**	
Course Code	**18U4PHC04**	**Title**	**Batch**	2018-2021
Hrs/Week	5	**CORE IV: MECHANICS**	**Semester**	IV
			Credits	5

Course Objectives

1. To enable the students in order to learn the basic principles, theory and concepts of mechanics.
2. To gain knowledge by the students in order to learn the operating principles of machines used in daily life
3. To acquire basic knowledge of working of machines.

Course Outcomes

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

Knowledge Level	**CO Number**	**CO Statement**
K1	CO1	Learn the basic concepts of Laws of motion and Rigid body dynamics.
K2	CO2	Learn the concept of Conservation Laws and Centre of Gravity.
K3	CO3	Understand about the Friction, Hydrodynamics and their applications.
K4	CO4	Acquire knowledge in classical mechanics.
K5	CO5	Acquire knowledge in classical and Quantum mechanics.

UNIT – I: Laws of Motion and dynamics of Rigid bodies **12**

Motion in two and three dimensions – relative motions – uniform circular motion – force and motions – Newton's law – mass inertia and force – gravitational force – applications of Newton's second law - collision – kinetic energy in collision.

Moment of inertia- theorems of moment of inertia- energy of rotating rigid body- Gyroscopes- Newton's law of universal gravitation- inertia and gravitational mass- motion in gravitational field due to a solid sphere and circular disc- Deduction of Newton's law of gravitation from Kepler's law.

UNIT – II: Conservation Laws and Centre of Gravity **12**

Laws of conservation of mass, energy - linear momentum – angular momentum – angular acceleration and torque.

Centre of gravity of a body – distinction between centre of gravity and centre of mass – centre of gravity of solid cone, solid hemisphere, hollow hemisphere and a tetrahedron.

UNIT – III: Friction and Hydrodynamics **12**

Friction : Laws of friction, angle of friction, cone of friction, equilibrium of a body on a rough inclined plane acted upon by an external force – friction dynamometer – friction clutch.

Hydrodynamics: Stream line flow- Equation of continuity of flow – energy of the liquid, Bernoulli's theorem- Applications of Bernoulli's theorem, venturimeter, pitot tube.

UNIT – IV:Classical Mechanics **12**

Mechanics of system of particles – constraints - classification, generalized coordinates - transformation equation - principle of virtual work - D'Alembert's principle - derivation of Lagrange's equation of motion- formulation of conservation theorems - generalized momentum - energy and linear momentum- Application-Atwood's machine.

UNIT–V:QuantumMechanics **12**

Introduction – Inadequacy of classical mechanics- Matter waves- De Broglie wavelength- Davission and Germer's experiment- G.P Thomson experiment- Uncertainity principle- Heisenberg's γ ray microscope- Determination of position.

Books for Study:

1. Mechanics and Mathematical Methods, R. Murugeshan, S. Chand and Co (2005).
2. Dynamics, Narayanamurthy, National Publishing Company, Eighth Edition, (2005).
3. Statics, Hydrostatics and Hydrodynamics, Narayanamurthy and Nagarathnam, National Publishing Company (2002).
4. Quantum Mechanics – Satyaprakash& Swati saluja, KNRN Publication (2015)

Books for Reference:

1. Classical Mechanics by H.Goldstein Addition Wesley Publications (2005)
2. Mechanics - D.S. Mathur , S. Chand and Co (2006)
3. Modern Physics- R. Murugesan and Kiruthikasivaprasath, S. Chand and Co (2014).

ONLINE SOURCES:

1. https://www.khanacademy.org/science/physics/forces-newtons-laws

2. http://nptel.ac.in/cources

Mapping with Programme outcomes

POS / CO	P01	P02	P03	P04	P05
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	M	M

CO4	**S**	**S**	**S**	**S**	**S**
CO5	**S**	**S**	**S**	**S**	**S**

S- Strong; M-Medium; L-Low

SEMESTER - III

Programme Code	B.Sc.,	**Programme Title**	**Bachelor of Science (Physics)**	
Course Code	18U3PHS01	**Title**	**Batch**	2018 - 2021
Hrs/Week	2	**SBEC: LASER TECHNOLOGY**	**Semester**	III
			Credits	2

Course Objectives

1. To enable the students to understand of the fundamental principles underlying the operation of lasers and their Spectroscopic applications.

2. To Describe the various interactions of light and matter and to Understand the use of laser technology in spectroscopic and industrial applications

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Course Outcomes

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

Knowledge Level	**CO Number**	**CO Statement**
K1	**CO1**	Learn the basic concepts of energy levels of atoms and molecules, population inversion.
K2	**CO2**	Understand the concept of Lasers and their characteristics.
K3	**CO3**	Understand about solid state lasers and its applications.
K4	**CO4**	Procure knowledge in gas and liquid lasers.
K5	**CO5**	Understand the applications of Laser.

Unit – I: Basic Concepts **8**

Energy levels of atoms and molecules - Absorption and Emission of Light - Spontaneous and Stimulated emission - Active medium - Population inversion - Pumping mechanisms - Einstein's coefficients and relation.

UNIT – II: Laser Characteristics **7**

Basic characteristics - Spatial and Temporal coherence - Beam quality and Output characteristics - Beam divergence and Focusing using optical system - Types of laser based output beam - Continuous pulsed lasers – Ultra short pulses.

UNIT – III: Solid State Lasers **7**

Introduction, Nd - YAG Laser and Semiconductor diode lasers, construction - Energy level diagram - Excitation mechanisms and Application.

UNIT – IV: Gas and Liquid Lasers **7**

He - Ne, CO_2 and Dye laser – Construction - Energy level diagram - Excitation mechanisms and Application.

UNIT – V: Laser Applications **7**

Industrial Applications: Laser in industry - Laser welding - Laser cutting and Laser drilling - Laser marking - Lasers in communication - Lasers in medicine.

Books for Study:

1. Optical fiber and Laser, Principles and Applications – Anuradha De, New Age International Pvt Ltd., 2010.
2. Optics and Spectroscopy – R.Murugeshan&KiruthigaSivaprasath, S.Chand& Company, 2010.
3. Elements of Spectroscopy – Gupta, Kumar & Sharma, Pragathiprakashan, 2009.

Books for Reference:

1. Laser Systems and Applications, NityanandChowdry and RichaVerma, PHI, 2011.

2. An introduction to LASERS – N.Avadhanulu , Chand & Company, 2001.

ONLINE SOURCES:

1. https://onlinecourses.nptel.ac.in
2. https://theopenacademy.com/content/lecture-4-laser-fundamentals-iii-cont

Mapping with Programme outcomes

PO / CO	P01	P02	P03	P04	P05
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S- Strong; M-Medium; L-Low

SEMESTER - IV

Programme Code	B.Sc.,	Programme Title	Bachelor of Science (Physics)	
Course Code	18U4PHS02	Title	Batch	2018-2021
Hrs/Week	2	SBEC: ENERGY PHYSICS	Semester	IV
			Credits	2

Course Objectives

To enable the students to aware about renewable energy types, energy resources and conservation of energy

Course Outcomes

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

Knowledge Level	CO Number	CO Statement
K1	CO1	Learn the basic concepts of energy sources.
K2	CO2	Understand the concept of renewable energy sources and its applications.
K3	CO3	Know the basic concepts of photovoltaic effect, solar cells principles and its characteristics.
K4	CO4	Understand the biomass energy and its applications.
K5	CO5	Understand the concept of energy consumption conservation and options.

UNIT - I: Introduction to Energy Sources **8**

Classification of Energy sources- Energy consumption as a measure of prosperity- Worlds reserve of commercial energy sources and their availability-wind energy-ocean thermal energy conversion(OTEC)-Tidal energy(basic ideas)-

Geothermal energy-Global warming- Renewable energy resources- advantages-Obstacles.

UNIT - II: Solar Thermal Energy **7**

Renewable energy sources - Solar radiation at the Earth's surface – Applications: Solar water heater, Solar space heating and cooling, distillation, green houses - solar thermal technologies-solar cooker.

UNIT - III: Photovoltaic Power Generation **7**

Photo voltaic effect - performance of cell-choice of materials for a solar cells-Basic requirement for obtaining an effective solar cell-Principles, types and power generation – characteristics, efficiency of solar cell generation

UNIT - IV: Biomass Energy **7**

Biomass energy–classification- Photosynthesis- Biomass conversion technology – Biogas generation-applications

UNIT - V: Energy Consumption, Conservation and Options **7**

Conservation of energy- Patterns of Energy consumption in domestic, Industrial, transportation and agricultural sectors- conservation principles and energy audit in these sectors-Energy options for developing countries.

Books for Study:

1. S.P.Sukhatme, Solar energy, Tata McGraw Hill Publishing company,Ed.,(1997)
2. G.D. Rai, Non Conventional Energy Sources,Ed.IV,Khanna publishers,(2007)
3. G.N. Tiwari, solar energy, Ed.,2004.

Books for reference:

1. B.H. Khan, Non Conventional Energy Sources, Tata McGraw Hill, Ed.,II,(2012).
2.D.S.Chauhan, S.K.Srivastava,Non Conventional Energy Sources Ed.V,(2004).

ONLINE SOURCES:

a. https://onlinecourses.nptel.ac.in
b. https://www.khanacademy.org/science/physics/quantum-physics/photons/v/photoelectric-effect

Mapping with Programme outcomes

PO / CO	P01	P02	P03	P04	P05
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S- Strong; M-Medium; L-Low

SEMESTER - III

Programme Code	B.Sc.,	**Programme Title**	**Bachelor of Science (Physics)**	
Course Code	18U3PHN01	**Title**	**Batch**	2018 - 2021
Hrs/Week	2	**NMEC - I: ESSENTIALS OF ELECTRICITY**	**Semester**	III
			Credits	2

Course Objectives

1. To acquire knowledge about Handling and identifying electrical instruments.
2. To Know about the principle used in the storage of electricity

Course Outcomes

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

Knowledge Level	**CO Number**	**CO Statement**
K1	CO1	Learn the basic concepts of electricity and principles of ohms law, Coulomb's law.
K2	CO2	Learn the units and measurements of electricity.
K3	CO3	Learn the concept of sources of electricity.
K4	CO4	Get the ideas about storage and conservation electricity.
K5	CO5	Learn the principles and operation of domestic electrical appliances.

UNIT – I: Electricity- An Introduction **4**

Electricity - Ohms law - Electric charge - Coulomb's law - Principle and types of Resistors and Capacitors.

UNIT – II: Electricity- Units and Measurements **5**

Current – Voltage – Units - Measuring meters: Galvanometer – Voltmeter – Ammeter - Multimeter.

UNIT – III: Generation of Electricity **5**

Preference for electricity - Sources of generation of electricity – Conventional - Nuclear Power stations - Non-conventional - Photovoltaic cells.

UNIT – IV: Storage and Conservation of Electricity **4**

Primary cells - Daniel cell - Lechlanche cell - Secondary cells - Lead cell – Nickel -Cadmium cell - Rechargeable cell - Conservation of electricity.

UNIT – V: Domestic Electrical Appliances **6**

Principle and Operation of electrical bulbs – Fans - Mixer grinder – Refrigerator - Air conditioner – UPS – Stabilizer - Microwave Oven.

Books for Study:

1. Electricity and Magnetism - R. Murugesan, S.Chand& Co., 2005.
2. Electricity and Magnetism- Brijlal and Subramaniam, S. Chand & Co., 2005.

Books for Reference:

1. A Text Book of Electrical Technology, Theraja. A. L, Theraja. B. K, S. Chand & Co., 2010.
2. Electricity and Magnetism- N. Nagarathinam and N. Lau, S. Chand & Sons, 2007.

ONLINE SOURCES:

1. https://www.khanacademy.org/science/ap-physics-1/ap-circuits-topic/current-ap
2. http://nptel.ac.in/cources

Mapping with Programme outcomes

PO / CO	P01	P02	P03	P04	P05
CO1	S	S	S	S	S
CO2	S	S	S	S	S

CO3	**S**	**S**	**S**	**S**	**S**
CO4	**S**	**S**	**S**	**S**	**S**
CO5	**S**	**S**	**S**	**S**	**S**

S- Strong; M-Medium; L-Low

SEMESTER - IV

Programme Code	B.Sc.,	Programme Title	PHYSICS	
Course Code	18U4PHN02	Title	Batch	2018 - 2021
Hrs/Week	2	NMEC-II: PHYSICS IN EVERYDAY LIFE	Semester	IV
			Credits	2

Course Objectives

To acquire knowledge about

- Different topics such as Mechanics which deals with principle and working of machines,
- Properties of matter which deals with behavior of matter, and also the principle of heat,
- a small introduction about optics and optical devices and also basic concepts of electricity.

Course Outcomes

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

Knowledge Level	CO Number	CO Statement
K1	CO1	Understand the fundamental principles of Mechanics.
K2	CO2	Understand the fundamentals of properties of matter and sound.
K3	CO3	Procure basic knowledge of Heat and Measurements.
K4	CO4	Understand the basic concept of light.
K5	CO5	Acquire basic knowledge in Electricity and Magnetism.

UNIT – I: Mechanics **4**

Motion, Force, Work, Power and Energy - Mass and Weight -Newton's law of motion. System of Forces - weight of a body in a lift. Gravitation- planetary motion and earth satellites – communication satellites.

UNIT – II: Properties of Matter& Sound **5**

Three states of matter - binding forces –Archimedes Principle - applications - Pascal law- capillary action - Surface Tension – Dimension of Surface Tension- Bernoulli's principle – Viscosity- Bunsen Burner.

Sound - reverberation - acoustics of building –intensity of sound – loudness of sound – noise pollution.

UNIT – III: Heat **5**

Definition- Measurement of heat and temperature – types of thermometers- platinum resistance thermometer- Clinical Thermometer-Expansion of solid, liquid & gas- Change of sign conversion.

UNIT – IV: Light **5**

Reflection-Refraction- Laws of refraction-Reflection through a lens- Image formation by a lens- Effect of silvering one of the refracting surface of a lens- determination of focal length of a convex lens by displacement method- Refractive index – Digital camera.

UNIT – V: Electricity and Magnetism **5**

Colomb's law - Ohm's law – Kirchaff laws - electric power - electrical safety - electromagnetic induction - Faraday's Law - Lenz Law - transformers . Carey-Foster Bridge – temperature coefficient of resistance – potentiometer. Properties of dia, para, ferro magnetism- CT scan.

Books for Study:

1. A Text book of Physics - D.C.Agarwal., (Volume-I).
2. A text book in Electrical technology – B.L. Teraja, S. Chand & Co., New Delhi 2006.
3. Electricity and Magnetism, Brijlal and Subramaniam, S.Chand& Co. 2008
4. Properties of Matter & Acoustics, R. Murugesan. S.Chand, 2005.

ONLINE SOURCES:

1. https://www.khanacademy.org/science/physics/forces-newtons-laws

2 .http://nptel.ac.in/cources

Mapping with Programme outcomes

PO / CO	P01	P02	P03	P04	P05
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S- Strong; M-Medium; L-Low

SEMESTER - I

Programme Code	B.Sc	Programme Title	Bachelor of Science (Mathematics & Chemistry)	
Course Code	18U1PHA01	Title	Batch	2019 - 2022
Hrs/Week	5	ALLIED PHYSICS - I	Semester	I
			Credits	05

Course Objectives

To acquire knowledge about

1. Different topics such as Properties of Matter which deals with experimental method.
2. Heat which deals with behavior of matter and also uses of Low temperature physics.
3. A small introduction about optics and optical devices and also concept of electricity.

Knowledge Level	CO Number	CO Statement
K1	CO1	To learn the basic concept of properties of matter, laser, heat , optics and electricity.
K2	CO2	To understand the, elasticity, laser, thermal heat , optical activity and electric devices
K3	CO3	To understand the principle of low pressure and their measurements.
K4	CO4	To understand the applications of elasticity, laser and electricity.
K5	CO5	To apply the basic concepts in real world problems.

UNIT – I: Properties of Matter **12**

Elasticity-Three types of elastic modulus - Poisson's ratio - Uniform and Non-uniform bending-theory and experiment-torsion-expression for coupled per

unit twist-torsion pendulum-theory of rigidity modulus by static torsion, surface tension-drop weight method.

UNIT – II: Laser and its applications 10

Basic Principle of Laser - condition for light amplification - Population Inversion - Threshold Condition-He-Ne laser-CO_2laser-Ruby Laser-Applications of laser in medicine and industries.

Unit – III: Heat 10

Specific heat-determination of C_p and C_v,- Van der walls equation, critical constant and their determination- expression for critical constant, thermal conductivity of bad conductor-Lees disc method, Joule Thomson effect-Porous plug experiment-theory-inversion temperature.

Unit – IV: Optics 14

Introduction – condition for interference – Fresnel's biprism – Airwedge – thickness of wire– diffraction of light – Fresnel and Fraunhofer diffraction –- Difference between interference and diffraction-Polarization-Nicol Prism polarizer and analyzer-quarter wave plate, half wave plate. Optical activity, analysis of light by Laurent's half side polarimeter.

Unit – V: Electricity 14

Theory measurement of resistance, Potentiometer, low range voltmeter and ammeter calibration, Choke coil, LCR circuits, Transformer, construction, theory, energy loss and uses.

Power point presentation, Seminar, Quiz, Assignment

Books for Study:

1. Properties of Matter, R. Murugeshan, S. Chand and Co (2004).
2. Modern physics – R.Murugesan, S.Chand& Co, Twelth Edition, (2004).
3. Heat and Thermodynamics, Brij Lal and Subramaniam, S. Chand and Co (2004).
4. Brijlal and Subrahmaniyam, Optics, S.Chand& Company (P) Ltd., 1987.
5. Optics and Spectroscopy, R. Murugeshan and Krithika, S. Chand and Co (2006).

6. Electricity and Magnetism, Brij Lal and Subramaniam, S. Chand and Co (2005).

Books for Reference:

1. Fundamentals of General Properties of Matter, H.R.Gulati, S.Chand and co.,(2005).

2. Thermal Physics,R.Murugeshan, Kiruthigasicaprasath (2004).

3. Modern Physics,R.Murugeshan (2013).

ONLINE SOURCES:

1. www.khanacademy.org/science/physics/elasticity/surface tension

2.www.khanacademy.org/science/physics/viscosity/

Heat/Optics/Electricity

PSO / CO	PS01	PS02	PS03	PS04	PS05
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

SEMESTER - II

ProgrammeCode	**B.Sc**	**Programme Title**	**Bachelor of Science (Mathematics & Chemistry)**	
Course Code	18U2PHA02	**Title**	**Batch**	2019–2022
Hrs/Week	5	**ALLIED PHYSICS - II**	**Semester**	II
			Credits	5

Course Objectives

To acquire knowledge about

1. Different topics such as Atomic Physics basic idea of structure and atom.
2. Solid state Physics which deals with behavior of crystal structure and different types of Bonding.
3. A small introduction about Basic Electronics and Digital Electronics.

Knowledge Level	**CO Number**	**CO Statement**
K1	CO1	To learn the basic concept of structure and functions of atoms.
K2	CO2	To understand the nucleus, various nuclear models, nuclear radiation detector.
K3	CO3	To learn the seven crystal system and different types of bonding.
K4	CO4	To idea know about the Semi conductor and their types.
K5	CO5	To learn the basic and Universal Building Blocks and Boolean expression.

UNIT – I: **12**

AtomicPhysics: Introduction to atomic physics- Bohr's theory and Somerfield theory-Vector atom model-Spatial quantization-Spinning electron-Quantum numbers associated with Vector atom model- Pauli's exclusion principle- Stern-Gerlach experiments.

UNIT-II: **10**

Nuclear Physics: Introduction- Classification of nuclei- General properties of nucleus- Binding energy- Nuclear stability- Nuclear models-liquid drop model-Shell model- Nuclear radiation detectors-Ionization chamber-Geiger Muller counter.

UNIT – III: **10**

Solid State Physics: Introduction to crystals-Periodic array of atoms-Unit cell-Basis-lattice-types-Two dimensional and three dimensional lattices- Seven crystal systems-Bonding in crystals-ionic bond-covalent bond-metallic bond-molecular bond- hydrogen bond.

UNIT – IV: **14**

Basic Electronics: Semi Conductor Physics – Intrinsic and Extrinsic semi conductor – P type and N type semi conductor-construction and characteristics of FET - Operational amplifiers- basic operations.

UNIT – V: **14**

Digital Electronics: Binary, Octal, Hexadecimal number and their inter conversion-Laws of Boolean algebra- De Morgans theorem –NAND/NOR gate as universal building blocks- Simplification of Boolean expression –Amplitude modulation – Modulation factor – Frequency modulation.

Power point presentation, Seminar, Quiz, Assignment

Books for Study:

1. Modern physics – R.Murugesan, S.Chand& Co, Twelth Edition, (2004).
2. Digital principles and applications – Malvino& Leach, TMH, (2000).
3. Principles of Electronics – V.K. Metha, S.Chand& Co (2001).
4. Solid state Physics- S. L. Kakani, C. Hemrajani, Sultan Chand & Sons, Fourth edition, 2005.
5. Solid state Physics- S.O. Pillai, New Age International Publishers, Sixth edition, 2011.

Books for Reference:

1. Fundamentals of General Properties of Matter, H.R.Gulati, S.Chand and co.,(2005).
2. Thermal physics ,R.Murugeshan, Kiruthigasicaprasath (2004).

3. Modern physics ,R.Murugeshan (2013).

ONLINE SOURCES:

a. www.khanacademy.org/science/physics/elasticity/surface tension
b. www.khanacademy.org/science/physics/viscosity/ Heat/Optics/Electricity

PSO / CO	PS01	PS02	PS03	PS04	PS05
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓