B. Sc. (Physics)

Programme Code: SCW03(P)BSC

SYLLABUS

(As per NEP 2020 Guidelines)

Sunbeam College for Women
Autonomous Post Graduate College | Accredited 'A' Grade by NAAC
BHAGWANPUR, VARANASI-221005 (U.P.)

College Code: 120

Sunbeam College for Women

An Autonomous Post Graduate College

206, Bhagwanpur, Lanka, Varanasi - 221005 Mob.: 9721452110

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DEPARTMENT OF PHYSICS

PROPOSED STRUCTURE OF UG PHYSICS SYLLABUS

According to National Education Policy-2020 For first three years of Higher Education (UG)

SEMESTER -WISE TITLES OF THE PAPERS IN UG PHYSICS COURSE

YEAR	SEMESTER	COURSECODE	PAPER TITLE	THEORY/ PRACTICAI	CREDIT
CERTIFICATE -IN BASIC PHYSICS & SEMICONDUCTOR DEVICES					
First	First	BS2410101T	Mathematical Physics & Newtonian Mechanics	Theory	4
		BS2410102P	Mechanical Properties of Matter	Practical	2
	Second	BS2410201T	Thermal Physics & Semiconductor Devices	Theory	4
		BS2410202P	Thermal Properties of Matter & Electronic Circuits	Practical	2
DIPLOMA - IN APPLIED PHYSICS WITH ELECTRONICS					
SECOND	Third	BS2410301T	Electromagnetic Theory & Modern Optics	Theory	4
		BS2410302P	Demonstrative Aspects of Optics & Magnetism	Practical	2
	Fourth	BS2410401T	Perspectives of Modern Physics & Basic Electronics	Theory	4
		BS2410402P	Basic Electronics Instrumentation	Practical	2
DEGREE -IN BACHELOR OF SCIENCE					
THIRD	Fifth	BS2410501T	Classical & Statistical Mechanics	Theory	4
		BS2410502T	Quantum Mechanics & Spectroscopy	Theory	4
		BS2410503P	Demonstrative Aspects of optics & electricity	Practical	2
	Sixth	BS2410601T	Solid State & Nuclear Physics	Theory	4
		BS2410602T	Analog & Digital Principles & Applications	Theory	4
		BS2410603P	Analog & Digital Circuits	Practical	2

SUBJECT PREREQUISITES

To study this subject, a student must have had the subjects **Physics & Mathematics** in class 12th.

PROGRAMME OUTCOMES (POs)

The practical value of science for productivity, for raising the standard of living of the people is surely recognized. Science as a power, which provides tools for effective action for the benefit of mankind or for conquering the forces of Nature or for developing resources, is surely highlighted everywhere. Besides the utilitarian aspect, the value of Science, lies in the fun called intellectual enjoyment. Science teaches the value of rational thought as well as importance of freedom of thought.

Our teaching so far has been aimed more at formal knowledge and understanding instead of training and application oriented. Presently, the emphasis is more on training, application and to some extent on appreciation, the fostering in the pupils of independent thinking and creativity. Surely, teaching has to be more objective based.

The process of application-based training, whether we call it a thrill or ability, is to be emphasized as much as the content.

Physics is a basic science; it attempts to explain the natural phenomenon in as simple a manner as possible. It is an intellectual activity aimed at interpreting the Multiverse. The starting point of all physics lies in experience. Experiment, whether done outside or in the laboratory, is an important ingredient of learning physics and hence the present programme integrates six experimental physics papers focusing on various aspects of modern technology based equipments. With all the limitations imposed (even the list of experiments as given in the syllabus) if the spirit of discovery by investigation is kept in mind, much of the thrill can be experienced.

1. The main aim of this programme is to help cultivate the love for Nature and its manifestations, to transmit the methods of science (the contents are only the means) to observe things around, to generalize, to do intelligent guessing, to formulate a theory & model, and at the same time, to hold an element of doubt and thereby to hope to modify it in terms of future experience and thus to practice a pragmatic outlook.
2. The programme intends to nurture the proficiency in functional areas of Physics, which is in line with the international standards, aimed at realizing the goals towards skilled India.
3. Keeping the application-oriented training in mind; this programme aims to give students the competence in the methods and techniques of theoretical, experimental and computational aspects of Physics so as to achieve an overall understanding of the subject for holistic development. This will cultivate in specific application oriented training leading to their goals of employment. 4. The Bachelor's Project (Industrial Training / Survey / Dissertation) is intended to give an essence of research work for excellence in explicit areas. It integrates with specific job requirements / opportunities and provides a foundation for Bachelor (Research) Programmes.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

CERTIFICATE IN BASIC PHYSICS & SEMICONDUCTOR DEVICES

FIRST YEAR

This programme aims to give students the competence in the methods and techniques of calculations using Newtonian Mechanics and Thermodynamics. At the end of the course the students are expected to have hands on experience in modeling, implementation and calculation of physical quantities of relevance.

An introduction to the field of Circuit Fundamentals and Basic Electronics which deals with the physics and technology of semiconductor devices is practically useful and gives the students an insight in handling electrical and electronic instruments.

Experimental physics has the most striking impact on the industry wherever the instruments are used. The industries of electronics, telecommunication and instrumentation will specially recognize this course.

DIPLOMA IN APPLIED PHYSICS WITH ELECTRONICS
SECOND YEAR

This programme aims to introduce the students with Electromagnetic Theory, Modern Optics and Relativistic Mechanics. Electromagnetic Wave Propagation serves as a basis for all communication systems and deals with the physics and technology of semiconductor optoelectronic devices. A deeper insight in Electronics is provided to address the important components in consumer Optoelectronics, IT and Communication devices, and in industrial instrumentation.

The need of Optical instruments and Lasers is surely highlighted everywhere and at the end of the course the students are expected to get acquaint with applications of Lasers in technology. Companies and R&D Laboratories working on Electromagnetic properties, Laser Applications, Optoelectronics and Communication Systems are expected to value this course.

DEGREE IN BACHELOR OF SCIENCE
THIRD YEAR

This programme contains very important aspects of modern days course curriculum, namely, Classical, Quantum and Statistical computational tools required in the calculation of physical quantities of relevance in interacting many body problems in physics. It introduces the branches of Solid - State Physics and Nuclear Physics that are going to be of utmost importance at both undergraduate and graduate level. Proficiency in this area will attract demand in research and industrial establishments engaged in activities involving applications of these fields.

This course amalgamates the comprehensive knowledge of Analog & Digital Principles and Applications. It presents an integrated approach to analog electronic circuitry and digital electronics.

Present course will attract immense recognition in R&D sectors and in the entire cutting edge technology based industry.

SEMESTER-WISE PAPER TITLES WITH DETAILS

YEAR	SEMESTER	PAPER	PAPER TITLE	PREREQUISITE For Paper	ELECTIVE For Major Subjects
CERTIFICATE IN BASIC PHYSICS & SEMICONDUCTOR DEVICES					
FIRST YEAR	**First**	Theory Paper-1	Mathematical Physics & Newtonian Mechanics	Physics in 12th / Mathematics in 12th	YES Open to all
		Practical Paper	Mechanical Properties of Matter	Opted / Passed Sem I, Th Paper-1	YES Bota./Chem./Comp. Sc./ Math./Stat./Zool
	Second	Theory Paper-1	Thermal Physics & Semiconductor Devices	Physics in 12th / Chemistry in 12th	YES Open to all
		Practical Paper	Thermal Properties of Matter & Electronic Circuits	Opted / Passed Sem II, Th Paper-1	YES Bota./Chem./Comp. Sc./Math./Stat./Zool
DIPLOMA IN APPLIED PHYSICS WITH ELECTRONICS					
SECOND YEAR	**Third**	Theory Paper-1	Electromagnetic Theory & Modern Optics	Passed Sem I, Th Paper-1	YES Open to all
		Practical Paper	Demonstrative Aspects of optics & Magnetism	Opted / Passed Sem III, Th Paper-1	YES Bota./Chem./Comp. Sc./Math./Stat./Zool
	Fourth	Theory Paper-1	Perspectives of Modern Physics & Basic Electronics	Passed Sem I, Th Paper-1	YES Open to all
		Practical Paper	Basic Electronics Instrumentation	Opted / Passed Sem IV, Th Paper-1	YES Bota./Chem./Comp. Sc./Math./Stat./Zool.
DEGREE IN BACHELOR OF SCIENCE					
THIRD YEAR	**Fifth**	Theory Paper-1	Classical & Statistical Mechanics	Passed Sem I, Th Paper-1	YES Chem./Comp. Sc./Math./Stat
		Theory Paper-2	Quantum Mechanics & Spectroscopy	Passed Sem IV, Th Paper-1	YES Chem./Comp. Sc./Math./Stat
		Practical Paper	Demonstrative Aspects of Optics & electricity	Passed Sem III, Th Paper-1	YES Chem./Comp. Sc./Math./Stat
	Sixth	Theory Paper-1	Solid State & Nuclear Physics	Passed Sem V, Th Paper-2	YES Chem./Comp. Sc./Math./Stat.
		Theory Paper-2	Analog & Digital Principles & Applications	Passed Sem IV, Th Paper-1	YES Open to all
		Practical Paper	Analog & Digital Circuits	Opted / Passed Sem VI, Th Paper-2	YES Chem./Comp. Sc./Math./Stat.

FIRST YEAR

DETAILED SYLLABUS FOR

CERTIFICATE IN

BASIC PHYSICS & SEMICONDUCTOR DEVICES

YEAR	SEMESTER	PAPER	PAPER TITLE	UNIT TITLE(Periods Per Semester)
CERTIFICATE IN BASIC PHYSICS & SEMICONDUCTOR DEVICES				
FIRST YEAR	**SEMESTER I**	Theory Paper-1	**Mathematical Physics & Newtonian Mechanics** Part A: Basic Mathematical Physics Part B: Newtonian Mechanics & Wave Motion	**Part A** I: Vector Algebra (7) II: Vector Calculus (8) III: Coordinate Systems (8) IV: Introduction to Tensors (7) **Part B** V: Dynamics of a System of Particles (8) VI: Dynamics of a Rigid Body (8) VII: Motion of Planets & Satellites (7) VIII: Wave Motion (7)
		Practical Paper	**Mechanical Properties of Matter**	Lab Experiment List Online Virtual Lab Experiment List/Link
	SEMESTER II	Theory Paper-1	**Thermal Physics & Semiconductor Devices** Part A: Thermodynamics & Kinetic Theory of Gases Part B: Circuit Fundamentals & Semiconductor Devices	**Part A** I: 0th & 1st Law of Thermodynamics (8) II: 2nd & 3rd Law of Thermodynamics (8) III: Kinetic Theory of Gases (7) IV: Theory of Radiation (7) **Part B** V: DC & AC Circuits (7) VI: Semiconductors & Diodes (8) VII: Transistors (8) VIII: Electronic Instrumentation (7)
		Practical Paper	**Thermal Properties of Matter & Electronic Circuits**	Lab Experiment List Online Virtual Lab Experiment List/Link

Programme/Class: **Certificate** Year: **First** Semester: **First**

Subject: **Physics** Course Code: **BS2410101T**

Course Title: **Mathematical Physics & Newtonian Mechanics**

Course Outcomes (COs)

1. Recognize the difference between scalars, vectors, pseudo-scalars and pseudo-vectors.
2. Understand the physical interpretation of gradient, divergence and curl.
3. Comprehend the difference and connection between Cartesian, spherical and cylindrical coordinate systems.
4. Know the meaning of 4-vectors, Kronecker delta and Epsilon (Levi Civita) tensors.
5. Study the origin of pseudo forces in rotating frame.
6. Study the response of the classical systems to external forces and their elastic deformation.
7. Understand the dynamics of planetary motion and the working of Global Positioning System (GPS).
8. Comprehend the different features of Simple Harmonic Motion (SHM) and wave propagation

Credit: 4 **Core compulsory/Elective**

Max.Marks: 25+75 **Min. Passing Marks:10+25.**

PART A
Basic Mathematical Physics

Unit -I

Introduction to Indian ancient Physics and contribution of Indian Physicists, in context with the holistic development of modern science and technology, should be included under Continuous Internal Evaluation (CIE).

Vector Algebra

Coordinate rotation, reflection and inversion as the basis for defining scalars, vectors, pseudoscalars and pseudo-vectors (include physical examples). Component form in 2D and 3D. Geometrical and physical interpretation of addition, subtraction, dot product, cross product and triple product of vectors. Position, separation and displacement vectors.

No. of Lecture: 7

Unit -II

Vector Calculus

Geometrical and physical interpretation of vector differentiation, Gradient, Divergence and Curl and their significance. Vector integration, Line, Surface (flux) and Volume integrals of vector fields. Gradient theorem, Gauss-divergence theorem, Stoke-curl theorem, Greens theorem and Helmholtz theorem (statement only).

No. of Lecture: 8

Unit -III

Coordinate Systems-I

2D & 3D Cartesian, Spherical and Cylindrical coordinate systems, basis vectors, transformation equations. Expressions for displacement vector, arc length, area element, volume element.

No. of Lecture: 8

Unit -IV

Coordinate Systems-II. Gradient, divergence and curl in different coordinate systems. Components of velocity and acceleration in different coordinate systems. Examples of non-inertial coordinate system and pseudo-acceleration. Introduction to Dirac delta function.

No. of Lecture: 7

PART B

Newtonian Mechanics & Wave Motion

Unit -V

Dynamics of a System of Particles

Review of historical development of mechanics up to Newton. Background, statement and critical analysis of Newton's axioms of motion. Dynamics of a system of particles, centre of mass motion, and conservation laws & their deductions. Rotating frames of reference, general derivation of origin of pseudo forces (Euler, Coriolis & centrifugal) in rotating frame, and effects of Coriolis force.

No. of Lecture: 8

Unit -VI

Dynamics of a Rigid Body

Angular momentum, Torque, Rotational energy. Rotational inertia for simple bodies (ring, disk, rod, solid and hollow sphere, solid and hollow cylinder, rectangular lamina). The combined translational and rotational motion of a rigid body on horizontal and inclined planes. Elasticity, relations between elastic constants, bending of beam and torsion of cylinder.

No. of Lecture: 8

Unit -VII

Motion of Planets & Satellites

Newton's law of gravitation, gravitational field and gravitational potential. Kepler's laws of planetary motion and their deductions. Motions of geo-synchronous & geo-stationary satellites and basic idea of Global Positioning System (GPS).

No. of Lecture: 7

Unit -VIII
Wave Motion

Differential equation of simple harmonic motion and its solution, use of complex notation, damped and forced oscillations, Quality factor. Composition of simple harmonic motion, Lissajous figures. Differential equation of wave motion. Principle of superposition of waves, stationary waves, phase and group velocity.

No. of Lecture: 7

Suggested Readings

PART A

1. Murray Spiegel, Seymour Lipschutz, Dennis Spellman, "Schaum's Outline Series: Vector Analysis", McGraw Hill, 2017, 2e

2. A.W. Joshi, "Matrices and Tensors in Physics", New Age International Private Limited, 1995, 3e

PART B

1. Charles Kittel, Walter D. Knight, Malvin A. Ruderman, Carl A. Helmholz, Burton J. Moyer, "Mechanics (In SI Units): Berkeley Physics Course Vol 1", McGraw Hill, 2017, 2e

2. Richard P. Feynman, Robert B. Leighton, Matthew Sands, "The Feynman Lectures on Physics - Vol. 1", Pearson Education Limited, 2012

3. Hugh D. Young and Roger A. Freedman, "Sears & Zemansky's University Physics with Modern Physics", Pearson Education Limited, 2017, 14e

4. D.S. Mathur, P.S. Hemne, "Mechanics", S. Chand Publishing, 1981, 3e

Course Prerequisites

Physics in 12th / Mathematics in 12th

This course can be opted as an Elective by the students of following subjects

Open to all

Suggested Continuous Internal Evaluation (CIE) Methods

20 marks for Test / Quiz / Assignment / Seminar

05 marks for Class Interaction

Programme/Class: **Certificate** Year: **First** Semester: **First**
Subject: **Physics**
Course Code: **BS2410102P** Course Title: **Mechanical Properties of Matter**

Course Outcomes (COs)

Experimental physics has the most striking impact on the industry wherever the instruments are used to study and determine the mechanical properties. Measurement precision and perfection is achieved through Lab Experiments.Online Virtual Lab Experiments give an insight in simulation techniques and provide a basis for modeling.

Credit: 2 **Core compulsory/Elective**
Max.Marks: 25+75 **Min. Passing Marks:10+25.**

Lab Experiment List

No. of Lecture: Sixty (60)

1. Moment of inertia of a flywheel
2. Moment of inertia of an irregular body by inertia table
3. Modulus of rigidity by statistical method (Barton's apparatus)
4. Modulus of rigidity by dynamical method (sphere / disc / Maxwell's needle)
5. Young's modulus by bending of beam
6. Young's modulus and Poisson's ratio by Searle's method
7. Poisson's ratio of rubber by rubber tubing
8. Acceleration due to gravity by bar pendulum
9. Height of a building by Sextant
10. Spring Constant of a spiral spring

Online Virtual Lab Experiment List / Link

Virtual Labs at Amrita Vishwa Vidyapeetham
https://vlab.amrita.edu/?sub=1&brch=74

1. Torque and angular acceleration of a fly wheel
2. Torsional oscillations in different liquids
4. Newton's second law of motion
5. Ballistic pendulum
6. Collision balls
7. Projectile motion
8. Elastic and inelastic collision

Suggested Readings

1. B.L. Worsnop, H.T. Flint, "Advanced Practical Physics for Students", Methuen & Co., Ltd., London, 1962, 9e
2. S. Panigrahi, B. Mallick, "Engineering Practical Physics", Cengage Learning India Pvt. Ltd., 2015, 1e

3. R.K. Agrawal, G. Jain, R. Sharma, "Practical Physics", Krishna Prakashan Media (Pvt.) Ltd., Meerut, 2019
4. S.L. Gupta, V. Kumar, "Practical Physics", Pragati Prakashan, Meerut, 2014, 2e

Course Prerequisites

Passed Physics in 12th / Mathematics in 12th

This course can be opted as an Elective by the students of following subjects

Botany/Chemistry/Zoology/Botany/Mathematics/Statistics

Suggested Continuous Internal Evaluation (CIE) Methods

15 marks for Record file (Depending upon the No. of experiment performed)
05 marks for Class Interaction,
05 marks for Viva Voce

Programme/Class: **Certificate** Year: **First** Semester: **Second**

Subject: **Physics**

Course Code: **BS2410201T**

Course Title: **Thermal Physics & Semiconductor Devices**

Course Outcomes (COs)

1. Recognize the difference between reversible and irreversible processes.
2. Understand the physical significance of thermodynamical potentials.
3. Comprehend the kinetic model of gases w.r.t. various gas laws.
4. Study the implementations and limitations of fundamental radiation laws.
5. Utility of AC bridges.
6. Recognize the basic components of electronic devices.
7. Design simple electronic circuits.
8. Understand the applications of various electronic instruments.

Credit: 4 **Core compulsory/Elective**
Max.Marks: 25+75 **Min. Passing Marks:10+25**

PART A

Thermodynamics & Kinetic Theory of Gases

Unit -I

0th & 1st Law of Thermodynamics

State functions and terminology of thermodynamics. Zeroth law and temperature. First law, internal energy, heat and work done. Work done in various thermodynamical processes. Enthalpy, relation between CP and CV. Carnot's engine, efficiency and Carnot's theorem.

No. of Lecture: 8

Unit -II

2nd & 3rd Law of Thermodynamics

Different statements of second law, Clausius inequality, entropy and its physical significance. Entropy changes in various thermodynamical processes. Third law of thermodynamics and unattainability of absolute zero. Thermodynamical potentials, Maxwell's relations. Clausius-Clapeyron equation, Joule-Thompson effect.

No. of Lecture:

Unit -III

Kinetic Theory of Gases

Kinetic model and deduction of gas laws. Derivation of Maxwell's law of distribution of velocities and its experimental verification. Degrees of freedom, law of equipartition of energy (no derivation) and its application to specific heat of gases (mono, di and poly atomic).

No. of Lecture: 7

Unit -IV
Theory of Radiation

Blackbody radiation, spectral distribution, concept of energy density and pressure of radiation. Derivation of Planck's law, deduction of Wien's distribution law, Rayleigh-Jeans law, Stefan-Boltzmann law and Wien's displacement law from Planck's law.

No. of Lecture: 7

PART B

Circuit Fundamentals & Semiconductor Devices

Unit -V
DC & AC Circuits

Growth and decay of currents in RL circuit. Charging and discharging of capacitor in RC, LC and RCL circuits. Network Analysis - Superposition, Reciprocity, Thevenin's and Norton's theorems. AC Bridges - measurement of inductance (Maxwell's, Owen's and Anderson's bridges) and measurement of capacitance (Schering's, Wein's and de Sauty's bridges).

No. of Lecture: 7

Unit -VI
Semiconductors & Diodes

P and N type semiconductors, qualitative idea of Fermi level. Formation of depletion layer in PN junction diode, field & potential at the depletion layer. Diode fabrication. PN junction diode and its characteristics. Principle, structure, characteristics and applications of Zener, Light Emitting and Photo diodes. Half and Full wave rectifiers, calculation of ripple factor, rectification efficiency and voltage regulation. Basic idea about filter circuits.

No. of Lecture: 8

Unit -VII
Transistors

Bipolar Junction PNP and NPN transistors. Study of CB, CE & CC configurations w.r.t. active, cutoff & saturation regions; characteristics; current, voltage & power gains; transistor currents & relations between them. DC Load Line analysis and Q-point stabilisation.

No. of Lecture: 8

Unit -VIII
Electronic Instrumentation

Multimeter: Principles of measurement of dc voltage, dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance. Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, electron gun, Front panel controls, special features of dual trace CRO, specifications of a CRO and their significance. Applications of

CRO to study the waveform and measurement of voltage, current, frequency & phase difference.

No. of Lecture: 7

Suggested Readings

PART A

1. M.W. Zemansky, R. Dittman, "Heat and Thermodynamics", McGraw Hill, 1997, 7e
2. F.W. Sears, G.L. Salinger, "Thermodynamics, Kinetic theory & Statistical thermodynamics", Narosa Publishing House, 1998
3. Enrico Fermi, "Thermodynamics", Dover Publications, 1956
4. S. Garg, R. Bansal, C. Ghosh, "Thermal Physics", McGraw Hill, 2012, 2e
5. Meghnad Saha, B.N. Srivastava, "A Treatise on Heat", Indian Press, 1973, 5e

PART B

1. R.L. Boylestad, L. Nashelsky, "Electronic Devices and Circuit Theory", Prentice-Hall of India Pvt. Ltd., 2015, 11e
2. J. Millman, C.C. Halkias, Satyabrata Jit, "Electronic Devices and Circuits", McGraw Hill, 2015, 4e
3. B.G. Streetman, S.K. Banerjee, "Solid State Electronic Devices", Pearson Education India, 2015, 7e
4. J.D. Ryder, "Electronic Fundamentals and Applications", Prentice-Hall of India Private Limited, 1975, 5e
5. A. Sudhakar, S.S. Palli, "Circuits and Networks: Analysis and Synthesis", McGraw Hill, 2015, 5e
6. S.L. Gupta, V. Kumar, "Hand Book of Electronics", Pragati Prakashan, Meerut, 2016, 43e

Course Prerequisites

Physics in 12th / Mathematics in 12th

This course can be opted as an Elective by the students of following subjects

Open to all

Suggested Continuous Internal Evaluation (CIE) Methods

20 marks for Test / Quiz / Assignment / Seminar

05 arks for Class Interaction

Note: In End semester examination equal weightage should be given to Part A and Part B while framing the question

Programme/Class: **Certificate** Year: **First** Semester: **Second**
Subject: **Physics**
Course Code: **B010202P** Course Title: **Thermal Properties of Matter & Electronic Circuits**

Course Outcomes (COs)

Experimental physics has the most striking impact on the industry wherever the instruments are used to study and determine the thermal and electronic properties. Measurement precision and perfection is achieved through Lab Experiments. Online Virtual Lab Experiments give an insight in simulation techniques and provide a basis for modeling.

Credit: 2 **Core compulsory/Elective**
Max.Marks: 25+75 **Min. Passing Marks:10+25**

Lab Experiment List

1. Coefficient of thermal conductivity of rubber
2. Coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method
3. Value of Stefan's constant
4. Verification of Stefan's law
5. Resonance in series and parallel RCL circuit
6. Characteristics of PN Junction diode.
7. Characteristics of Zener diode.,
8. Characteristics of Tunnel diode.
9. Characteristics of Light Emitting diode.
10. Characteristics of Photo diode.
11. Characteristics of a transistor (PNP and NPN) in CE and CB configurations.
12. Half wave & full wave rectifiers.

Online Virtual Lab Experiment List / Link
Thermal Properties of Matter:
Virtual Labs at Amrita Vishwa Vidyapeetham
https://vlab.amrita.edu/?sub=1&brch=194
1. Heat transfer by radiation
2. Heat transfer by conduction
3. Heat transfer by natural convection
4. The study of phase change
5. Black body radiation: Determination of Stefan's constant
6. Newton's law of cooling
7. Lee's disc apparatus
8. Thermo-couple: Seebeck effects

Suggested Readings

1. B.L. Worsnop, H.T. Flint, "Advanced Practical Physics for Students", Methuen & Co., Ltd., London, 1962, 9e
2. S. Panigrahi, B. Mallick, "Engineering Practical Physics", Cengage Learning India Pvt. Ltd., 2015, 1e
3. R.L. Boylestad, L. Nashelsky, "Electronic Devices and Circuit Theory", Prentice-Hall of India Pvt. Ltd., 2015, 11e

4. A. Sudhakar, S.S. Palli, "Circuits and Networks: Analysis and Synthesis", McGraw Hill, 2015, 5e

Course Prerequisites

Passed semester-I

This course can be opted as an Elective by the students of following subjects

Botany/Chemistry/Zoology/Botany/Mathematics/Statistics

Suggested Continuous Internal Evaluation (CIE) Methods

15 marks for Record file (Depending upon the No. of experiment performed)
05 marks for Class Interaction,
05 marks for Viva Voce