

<b>Course Title</b>	<b>Physics</b>	
<b>Course Code</b>	BPH301	
<b>Course Credit</b>	Lecture	: 4
	Practical	: 3
	Total	: 7
<b>Course Objectives</b>		
<p>At the end of the course the students will be able to:</p> <ul style="list-style-type: none"> <li>▪ Understand basic concepts of bending moment, cantilever, viscosity, flow of liquid, radiation, electric field, magnetism, relativity and transistors</li> <li>▪ Apply the concept of thermodynamics, electric field, transistor biasing and magnetism.</li> <li>▪ Perform the practical of cantilever, heat transfer, electric field and magnetic hysteresis.</li> <li>▪ Conclude the effect of electric field and magnetic field</li> </ul>		
<b>Detailed Syllabus</b>		
<b>Sr. No.</b>	<b>Name of Chapter &amp; Details</b>	<b>Hours Allotted</b>
<b>Section-1</b>		
<b>1</b>	<b>Properties of Matter:</b> Bending of Beam, Bending Moment of a Beam, Cantilever loaded at the free end, Cantilever supported at its ends, loaded in the middle, Viscosity and coefficient of viscosity, Streamline and Turbulent flow, Reynold's number, Poiseulle's Equation for the flow of liquid through a tube, Volume of liquid flowing out, Stoke's law.	<b>6</b>
<b>2</b>	<b>Thermodynamics:</b> Work done of a gas at constant pressure, Change in internal energy, Work done by isothermal expansion, First law of Thermodynamics, Second law of Thermodynamics, Thermodynamic Process (only	<b>8</b>

	definition), Heat Engine, Thermal efficiency of Heat Engine, Carnot Theorem, Concept of entropy, General Expression for the change of Entropy of a Perfect gas, Isothermal and Adiabatic process, Change of entropy in Reversible and Irreversible process, Entropy and Disorder - Third law of Thermodynamics.	
<b>3</b>	<b>Radiation Heat:</b> Properties of radiant heat, Emission and absorption of Radiation, Absorbing power, Reflecting power, Transmitting power, Radiating, Black Body, Stefan's Law, Wien's Law, Energy distribution in a Black Body, Rayleigh-Jeans Law, Planck's Law.	<b>6</b>
<b>4</b>	<b>Electric Field and Potential:</b> Electric field intensity, Electric Flux, Electric Flux density, Gauss Law, Proof of Gauss Law, Field around a charged straight conductor, Electric field around a sphere, Electric Potential, Potential gradient and Electric Intensity, Potential of a charged sphere, Potential and Electric field due to Electric dipole, Potential energy of a Capacitor, Capacity of a condenser (Capacitor), Capacity of a Parallel Plate Condenser.	<b>8</b>
	<b>Section-2</b>	
<b>5</b>	<b>Magnetism:</b> Magnetic field and Magnetic Induction, Hall Effect, Hall Voltage and Hall coefficient, Hall Mobility, Magnetic flux, Magnetic field around current carrying conductor, Magnetic field due to solenoid, Magnetic susceptibility and permeability, Para, Dia, Ferro-magnetic substances, Hysterisis loop, Energy loss due to Hysterisis, Self Induction, Self Inductance of a solenoid, Mutual Inductance, Mutual Inductance of two solenoids.	<b>8</b>
<b>6</b>	<b>Relativity:</b> Galilean Transformation, Ether Hypothesis, Michelson-Morley Experiment, Special theory of Relativity, Lorentz Transformation, Length contraction, Time dilation, Relativity of simultaneity, Addition of velocities, Variation of mass with velocity, Mass-Energy relation.	<b>6</b>
<b>7</b>	<b>Transistor Biasing:</b> Transistor biasing, Inherent variations of Transistor Parameters, Stabilization, Stability Factor, Methods of Transistor Biasing,	<b>6</b>

	Base Resistor method, Biasing with feedback resistor, Voltage divider bias method, Design of transistor biasing circuits.	
<b>8</b>	<b>Single stage Transistor Amplifier:</b> Single stage Transistor amplifier, How a transistor amplifier works, Practical Circuit of Transistor amplifier, Phase reversal, Load line analysis, Voltage gain, Classification of Amplifier, Frequency response & Bandwidth.	<b>8</b>

### Laboratory course

#### LIST OF EXPERIMENTS:

1. Determine the Young's modulus by Cantilever.
2. Determine the Young's modulus by bending of beam.
3. Study of one dimensional elastic collision using two spheres.
4. Determine the viscosity of liquid by Searl's co-axial cylinder.
5. Determine the thermal conductivity of cardboard by Lee's Method.
6. Temperature of filament and Heat radiation & verification of Stefan's Law.
7. Find the co-efficient of viscosity of water by its flow through capillary tube of uniform bore.
8. Determine the Moment of Inertia of a Fly wheel.
9. Determine the figure of merit & volt sensitivity of ballistic galvanometer.
10. Measurement of High resistances by leakage.
11. Comparison of Capacitance by De Sauty's method
12. Measurement of specific resistance of electrolyte by Kohlrauch's Method
13. Study of magnetic field of Solenoid.
14. Determine the self induction by Maxwell Bridge.
15. Frequency response & Bandwidth of R.C.Coupled Amplifier.
16. Experimental checkups by Multimeter, (Power Supply, Resistor, Transistor, Diode, Capacitor).

#### Instructional Method and Pedagogy:

- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
- Surprise tests/Quizzes/Tutorials will be conducted.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Approximately ten experiments shall be there in the laboratory related to course contents.

**Reference Books:**

- Engineering Physics by R.K.Gaur, S.L.Gupta, Dhanpat Rai Publications.
- Principles of Electronics by V.K.Mehta & Rohit Mehta., S.Chand Company.
- Modern Physics by R.Murugesan & Kiruthiga Sivaprasath, S.Chand Comp.
- Waves and Oscillations by Brij Lal and Subrahmaniam. S.Chand comp.