



C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: - Technology and Engineering (Diploma Engineering)

DEPARTMENT OF: - Humanities

SEMESTER: - II

CODE: - 2TE02APH1

NAME – Applied Physics

Teaching & Evaluation Scheme:-

| Subject Code | Subject Name | Teaching Scheme (Hours) | | | | Credits | Evaluation Scheme | | | | | | | |
|--------------|-----------------|-------------------------|----|----|-------|---------|-------------------|-------|-----------------|-------|-------------------|----|------------|-------------|
| | | Th | Tu | Pr | Total | | Theory | | | | Practical (Marks) | | | Total Marks |
| | | | | | | | Sessional Exam | | University Exam | | Internal | | University | |
| | | | | | | | Marks | Hours | Marks | Hours | Pr | TW | Pr | |
| 2TE02APH1 | Applied Physics | 4 | 0 | 2 | 6 | 5 | 30 | 1.5 | 70 | 03 | 30 | 20 | ----- | 150 |

Objectives:-

- Concept of physics
- Basic concepts of unit
- Properties of light
- Basic idea about force, band theory of solids and radioactivity

Prerequisites: - Wave motion, sound, Ohm's law, series and parallel combination, Nano science and Nano technology, concept of motion, force and laws of motion, and nuclear physics.

Course Outlines:-

| Sr. No. | Course Contents | Hours |
|---------|--|-----------|
| 1 | SI Units and Measuring Instruments : What Is Physics?, Fundamental Forces In Nature, Unit, Systems of Units, Types of Physical Quantity, Measuring Instruments: Vernier Calliper, Micrometer Screw Gauge and Physical Balance, Problems Based on Vernier Calliper and Micrometer Screw | 07 |
| 2 | Wave Motion and Sound : Definition of Wave and Wave Motion, Classification and Types of Waves, Definitions Related to Wave, Relation Between Velocity, Wave Length & Frequency, Simple Harmonic Motion, Simple Pendulum, Acoustics: Introduction, Definition and Meaning of Acoustics, Echo, Reverberation, and Reverberation Time, Ultrasonic Properties, Applications and Production of Ultrasonic Waves | 11 |
| 3 | Surface Tension and Viscosity : Cohesive and Adhesive Force, Surface Tension Illustrations, Explanation of Surface Tension by Molecular Phenomenon, Angle of Contact Definition and Illustrations, Capillary Action. Derivation of Expression For Surface Tension, Determination of Surface Tension of A Liquid Using Capillary Action, Viscosity Definition of Viscosity and Viscosity Index, Measurement of Viscosity, Red Wood Viscometer | 05 |
| 4 | Ray Optics, Nano Science and Nano Technology : Electromagnetic Waves, Electromagnetic Spectrum, Properties of Light and Their Illustrations, Light In Nature – Scattering of Light, Rainbow, Introduction to Nanotechnology , Carbon Based Structure of Nano Technology, Use of Nano Technology In Engineering Field, Name of Techniques to Produce Nano Materials | 06 |

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|---|--|----|
| 5 | Force and Motion : Recapitulation of Equations of Motion, Newton's 1 st Law of Motion, Basic Forces In Motion, Newton's 2 nd Law of Motion, Simple Problems on $F = Ma$ and Equations of Motion, Newton's 3 rd Law of Motion and Its Examples, Law of Conservation of Momentum, Statement, Simple Problems | 06 |
| 6 | Semi Conductor and Transistor : Band Theory of Solid, Classification of Solids Based on Energy Band - Conductors, Insulators and Semiconductors, Types of Semi Conductor - Intrinsic and Extrinsic Semiconductors, Temperature Dependence of Conductivity, P-N Junction Diode, V-I Characteristics of P-N Junction Diode, Rectifier Circuits -Full Wave, Half Wave and Bridge Rectifiers (No Design), Transistor : Introduction, Types of Semiconductor Transistor and Their Symbolsb Characteristics of Pnp and Npn Semiconductor Transistor, Application of Transistor | 09 |
| 7 | Current Electricity : Introduction, Concept of Charge, Coulomb's Inverse Square Law, Electric Field Intensity, Potential and Potential Difference, Electric Current, Ohm's Law, Laws of Series and Parallel Combination of Resistance, Electric Circuits, Kirchhoff's Law, Heating Effect & Chemical Effect of Current | 07 |
| 8 | Radioactivity And Nuclear Physics : Introduction, Radioactivity: Definition. Kinds of Radioactivity. (Natural & Artificial) Units of Radioactivity, Laws of Radioactivity, Half Life, Average Life & Decay Constant, Radioactive Rays: Properties And Uses of Alpha, Beta And Gamma Particles, Nuclear Physics: Structure of Nucleus, Mass Defect and Binding Energy, Nuclear Fission: Phenomenon of Fission, Elements Undergoing Fission, Chain Reactions and Multiple Chain Reactions, Application of Nuclear Fission, Nuclear Fusion and Nuclear Reactor, Nuclear Fusion: Phenomenon of Fusion, Elements Undergoing Fusion, Applications of Nuclear Fusion, Nuclear Reactor | 09 |

List of experiments:-

- To Measure Linear Dimensions by Vernier Caliper and Calculate Volume.
- To Measure Linear Dimensions by Micrometer Screw.
- Measurement of Specific Gravity of Given Solid.
- Determination of Radius of Surface Tension of a Given Liquid.
- Measurement of Viscosity
- Measurement of Area.
- To Calculate Resistance Using Ohm's Law
- To Verify Law of Resistance In Series and Parallel
- Determination of Acceleration Due to Gravity (G) Using Simple Pendulum.
- To Determine Errors In Electrical Measurements.
- Measurement of Energy
- To Study P-N Junction In Forward and Reverse Bias.

Learning Outcomes:-

- Physical Quantities and Their Units.
- Measure Given Dimensions Using Appropriate Instruments Accurately and Calculate Error In The measurement.
- Comprehend the Concept of Wave Motion. Definition Related to Wave and Wave Motion.
- Acoustics of Building and Factors Affecting It. Production and Applications of Ultrasonic Waves.
- State Properties of Light. Use of Nanotechnology In Engineering Field.
- Newton's Law of Gravitation. Basics of Semiconductor, P-N Junction Diode and Transistor.
- Ohm's Law and Combination of Resistance. Radioactivity and Concept of Nuclear Physics.

Books Recommended:-

- *Concept of Physics*(Volume-1-2013,volume-2-2009), **H.C.Verma**, Bharti bhavan
- *Principle of Physic* (9th edition), **Halliday & Resnick**, Wiley India Pvt. Ltd. New Delhi
- *Conceptual Physics*, **Paul G Hewitt**, Wesley Addison 2001