SEMESTER – I
AC I - ALLIED PHYSICS COURSE I

Internal: 25 **Subject Code : UPA1**
External: 75 **Exam Hours: 3**

Objective:

To understand basic theories and experiments in Physics.

Unit-1 MECHANICS: 12 Hrs

Centre of Gravity-Centre of gravity of Solid Cone, Solid and hollow hemisphere-Stability of floating bodies-law of floatation- Metacentre-Condition for stability-Determination of Metacentric height of a ship.

Unit-2 SOUND: 12 Hrs

Simple Harmonic motion-composition of two simple harmonic motions along a straight line and at right angles to each other. Acoustics of buildings-reverberation-reverberation time-Sabine's formula-Factors affecting acoustics of buildings- conditions for good acoustics.

Unit-3 PROPERTIES OF MATTER 12 Hrs

Surface tension-Definition of S.T Units-Dimensions- Experimental determination of Surface tension of water drop weight method- Viscosity- Units and dimensions Streamline flow and Turbulent flow – critical velocity- Co-efficient of viscosity- Experimental determination of co-efficient of viscosity using [variable Pressure Head].

Unit-4 THERMAL PHYSICS 12 Hrs

Newton's law of cooling-verification specific heat capacity of a liquid by cooling-Bomb calorimeter. **Conduction:** Co-efficient of thermal conductivity-Good and bad conductor-Lee's disc method for bad conductor, Stefan's law -Solar constant-Angstrom Pyrohelio meter-Temperature of the sun.

Unit-5 OPTICS 12 Hrs

Electro magnetic spectrum-Spectral response of human eye-UV and IR spectroscopy-Raman effect –Experimental arrangement- Application of Raman Effect.
Fiber optic communication: Introduction-Optic Fiber- Types of Fiber (Step and Graded index)-Numerical aperture Coherent bundle - Fiber Optic Communication system and its advantage-Single and Multimode Fiber Optic Sensors.

BOOKS FOR STUDY:

1. Allied Physics I – A.Sundaravelusamy
2. R.Murughasan- Properties of Matter,S. Chand & Co , 2004

BOOKS FOR REFERENCE

1. R.L. Saihgal, A Text books of Sound, S.Chand & Co,1990
2. Brijlal and Subramanian, Heat and Thermodynamic S. Chand & Co,2002
3. R.Murughasan- Mechanics, S. Chand & Co.

SEMESTER – II

AC II- ALLIED PHYSICS COURSE II

(Any 12 Experiments)

Internal: 40 **Subject Code : UPA2Y**

External: 60 **Exam Hours: 3**

Objective:

To acquire basic understanding of laboratory technique and to educate and motivate the students in the field of Physics.

1. Non-Uniform bending – Pin and Microscope.
2. Uniform bending-scale and Telescope.
3. Surface tension and Interfacial Surface tension by Drop weight Method.
4. Coefficient of viscosity of liquid – Variable Pressure head Method.
5. Thermal conductivity of a bad conductor – Lee's disc Method.
6. Specific heat capacity of liquid – Newton's cooling Method.
7. Spectrometer – Refractive index of a solid prism.
8. Air wedge – Thickness of the given thin wire.
9. Potentiometer – low range voltmeter.
10. Carey Foster's Bridge – Resistance Determination.
11. Meter bridge – Specific resistance.
12. Characteristics of a junction diode –Forward resistance and knee voltage.
13. Characteristics of a Zener diode-Break down voltage.
14. Basic logic gates – AND, OR and NOT gates using discrete components.

Books for Study:

1. Dr.S.Somasundaram, *Practical Physics,* Apsara publications, Tiruchirapalli, 2012.

2. R. Sasikumar, *Practical Physics*, PHI Learning Pvt. Ltd, New Delhi2011.

Books for Reference:

1. S.Srinivasan,*A Text Book of Practical physics.*, S.Sultanch and publications.

2. Department of Physics, *Practical Physics*, (B.Sc Physics Main), St.Joseph's College, Tiruchirapalli 1998.

SEMESTER – II

AC III - ALLIED PHYSICS COURSE III

Internal: 25 **Subject Code : UPA3**

External: 75 **Exam Hours: 3**

Objective:

This course is to high light the Modern Physics and digital Electronics

Unit-1 ELECTROSTATICS **12 Hrs**

Coulomb's law- Guass's theorem, its application field due to an infinite long plane, Sphere and Cylinder – Mechanical force on the surface of a charged conductor-Electrostatics-Formation of cloud and charged particles. Capacitors-Principles of a capacitor-capacity of a capacitor-capacity of Spherical and cylindrical capacitor-energy of a charged capacitor-sharing of charges and loss of energy.

Unit-2: ELECTRICITY **12 Hrs**

Kirchhoff's Laws and their applications to Wheat stone's net work –Carey Foster Bridge – Determination of resistance.Circuit control and Protective Devices-Switch-its types-Fuse – Circuit Breakers- Relays.

Unit-3: ATOMIC PHYSICS **12 Hrs**

Atom model- Vector atom model-Various Quantum Numbers -Pauli's Exclusion Principle. X-Rays Continuous and Characteristics of X-rays-Bragg's law-Determination of Crystal Structure by Laue's Powder Photo Graph Method.

Unit-4: NUCLEAR PHYSICS **12 Hrs**

Nucleus-Nuclear size-Charge-Mass and Spin-Liquid drop and Shell models, Nuclear fission and fusion-Nuclear reactor. Betatron- Bubble Chamber.

Unit-5: ELECTRONICS **12 Hrs**

P-N junction-V-I Characteristics of junction diode- Zener Diode-Voltage regulator using Zener Diode.**Logic Gates:** AND, OR, NOT gates-using discrete components- NAND and NOR Gates as Universal building blocks - Demorgan's theorem- Verification. Elementary ideas of ICS, SSI, MSI, LSI and VLSI.

BOOKS FOR STUDY:

Allied Physics II- A.Sundaravelusamy

BOOKS FOR REFERENCE :

1. R. Murugesan -Electricity and Magnetism, S. Chand & Co, 2002.
2. R. Murugasen - Modern Physics, S.Chand & Co, 1998.
3. R. Murugesan – Allied Physics.

SEMESTER – II
ALLIED PHYSICS COURSE I
APPLIED PHYSICS

Internal: 25 **Subject Code : UPAP1**
External: 75 **Exam Hours : 3**

To bring out the subjects related with the computer field which help students to keep pace with these topics.

Unit-INumberSystems and Logic Gates **12Hrs**

Introduction to decimal, binary, octal, hexadecimal number systems – Inter conversions Basic and derived logic gates, symbols and their truth tables – AND, OR NOT, NAND, NOR, XOR, and XNOR – Universality of NAND and NOR gates.Fundamental laws of Boolean Algebra - Simplification of logical expressions- Demorgan's theorem - verification- Universal building block NAND & NOR – Three and Four variable Karnaugh map simplification (both SOP and POS) .

Unit- II Combinational digital Systems **12Hrs**

Half and full adders – Half and full subtractors –Multiplexer (4x1) – Demultiplexer (1x4) – Decoder -Encoder– BCD Binary adder.

Unit-IIISequentialDigitalSystems **12Hrs**

Flip flop – RS – clocked RS – T and D flip flops – JK and master slave flip flops – Counters – Four bit asynchronous ripple counter – Mod-10 counter – Ring counter – Synchronous counter – Shift registers – Left and Right shift registers.

Unit- IV Memory Storage **12Hrs**

Bit- Byte memory- ROM –types of ROM, PROM, EPROM,E^2 PROM -RAM –Static – Dynamic-Types of RAM – Storage Devices –Floppy –Hard Disk – Flash drive.

Unit–V D/AandA/DConverter: **12Hrs**

D/A Converter-Variable Resistor network-Binary Ladder D/A Converter-Accuracy and Resolution- A/D Converter-Voltage-Frequency Converters- A/D Converter using V to F Conversion.

Books for Study

1. Digital Principles and Application, A.P. Malvino, D.P. Leach, IV Edition, McGraw Hill, New Delhi, 1986.
2. Fundamentals of Microprocessor- 8085, V.Vijayendran, S.Viswanathan, Printers and Publishers Private Ltd, Chennai, 2004.
3. Digital Fundamentals - V.Vijayendran, S.Viswanathan, Printers and Publishers Private Ltd, Chennai, 2004.

Books for Reference

1. Fundamentals of Microprocessor and Microcomputers, B.Ram, Dhanpat Rai Publications, New Delhi, 2006.

SEMESTER – II

APPLIED PHYSICS
ALLIED PHYSICS PRACTICAL -II
(Any 12 Experiments)

Internal: 40 **Subject Code : UPAP2Y**
External: 60 **Exam Hours: 3**

Objective:

It promotes the exhaustive requirements and expectations of the students to acquire practical knowledge for the theory given in their syllabus.

1. Semi-Conductor diode - Characteristics.
2. Zener diode – Characteristics.
3. FET- Characteristics.
4. Transistor Characteristics - CE configuration.
5. Metre Bridge-Specific Resistance.
6. Potentiometer-Measurement of Current.
7. Potentiometer-Calibration of low range voltmeter.
8. Carey Foster's Bridge- Specific Resistance.
9. LCR - Series resonance circuit
10. LCR - Parallel resonance circuit
11. Logic Gates (AND, OR, NOT, NAND, NOR and EX-OR) Using IC's.
12. NAND and NOR as Universal Gates.
13. Verification of De-Morgan's Theorems.
14. Half –Adder and Half –Subtractor using logic gates.
15. Single Stage Amplifier.

Books for Study:

1. Srinivasan M.N. Balasubramanian S. &Renganathan R., *A Text book of Practical Physics,* Sulthan Chand & Sons, New Delhi, 2000.

2. Somasundram S., *Practical Physics*, Apsara Publications, Tiruchirappalli.2012.

Books for Reference:

1. Department of Physics, *Practical Physics,* (B.Sc Physics Main), St. Joseph's College, Tiruchirapalli 1998.