MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)
(An Autonomous Institution Affiliated to Madurai Kamaraj University)
(Accredited with "A" Grade by NAAC)
Pasumalai, Madurai -625004

V & VI SEMESTER - COURSE OUTCOMES
SCIENCE

B.Sc., PHYSICS

18UPHC51 CLASSICAL AND STATISTICAL MECHANICS

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Define Frame of reference, Degrees of freedom, coordinate systems, Phase space and energy distribution

CO2: Elaborate conservation laws, constraints, cyclic coordinates ensembles, velocity distribution law.

CO3: Understand the concepts of microstate, macro state, ensemble, phase space, thermodynamic probability and Fermi-Dirac statistics.

CO4: Examinecentre of mass of frame of reference, Langrangians's equations from D'Alembert's principle, Hamilton's equations in coordinate systems, Boltzmann theorem on entropy and probability, three distribution laws.

CO5: Importance of conservation of energy ,principle of virtual work, momentum and cyclic coordinates, quantum statistics, Bose-Einstein statistics

18UPHC52 ANALOG ELECTRONICS

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Understand Thevenin's and Norton's Theorem, Two port Network Analysis , N type and P type semiconductors, NPN and PNP transistors, CE Amplifier, Hartley, Colpitt and Phase Shift Oscillator, Multivibrator , AM and FM Modulation,

CO2: Applying and deriving current ,voltage and power gain, input and output impedance of CE amplifier using 'h'parameter,Op-Amp for making adder, subtractor , differentiator and integrator

CO3: Analyse biasing of diodes and transistors

CO4: Evaluating Barkhausen criterion for oscillations

CO5: Construction of oscillators and astablemultivibrator using discrete components

18UPHE51 NUCLEAR PHYSICS

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Understand the nuclear forces, models of nuclear structure, elementary particles, laws of radio activity fission and fusion reactions, Types of nuclear reactors.

CO2: Application of nuclear binding energy, Synchrotron, synchrocyclotron, wavelength of crystal spectrometer, Thermo nuclear reaction, Radio isotopes .

CO3: Analyse nuclear models, chamber, internal conversion of energy, C-N cycle and P-P cycle, nuclear reactor.

CO4: Evaluate liquid drop model, photographic emulsion technique, neutrino theory and β decay, van Allen belts, electricity from nuclear energy.

CO5: Create knowledge in the particle accelerators, disintegration energy, Nuclear Transmutations, varies types, Radio isotopes.

18UPHE52 CONDENSED MATTER PHYSICS

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Understand crystal structure, free electron theory of metals, types of magnetism, polar and non polar dielectrics, properties of semiconductor**.**

CO2: Application of Miller indices, conductivities of metals, Langevin's theory of dia and para magnetism, Intrinsic and Extrinsic semiconductor.

CO3: Analyse the structure of diamond and zinc blende, Widemannfranz law, magnetic materials, types of polarization, carrier concentration.

CO4: Evaluate specific heat theories of solids, BCS theory, hard and soft magnetic materials, frequency and temperature dependence, variation of Femi level.

CO5: Create knowledge in the forming crystal structure

18UPHE53 ASTROPHYSICS

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Understand basic concepts of positional astronomy like astronomical coordinate system, astronomical techniques, various types of optical telescopes and telescope mountings, various types of detectors and their use with telescopes and Physics of sun and our solar system.

CO2: Measure distances, time, temperature and radius of star.

CO3: Analysis of speed of light, Chandrasekhar's Limit and differential Rotation of Sun.

CO4: Evaluate aperture, focal length and magnification or power of telescopes.

CO5: Develop ideas on Future of Universe.

18UPHCP3 NON – ELECTRONICS PRACTICAL

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Understand the function of instruments like spectrometer and spot galvanometer

CO2: Relate analyse angle of incidence and emergence

CO3: Find wavelength of light and particle size using laser

CO4: Compare the impedance and power factor of LR and CR circuits

CO5: Justify, Bridge circuits, Grating, LCR circuits

18UPHCP4 ELECTRONICS PRACTICAL

Course Outcomes
On successful completion of the course, the learners should be able to

CO1: Understand functions of operational amplifier, Half adder, Full adder
CO2: Show the various Rectifier circuit, Diode, Transistor characteristics
CO3: Use various stages of amplifier circuits and oscillator – Frequency
CO4: Learn the circuit connections using various electronic components by individual soldering method
CO5: Interpret Cathode Ray Oscilloscope, Trainer Board Circuits, 8085 Microprocessor

18UPHPR1 PROJECT

18UPHS51 GEMOLOGY

Course Outcomes:
On successful completion of the course, the learners should be able to
CO1: Define Scratch test, Hardness, Gem, crystalline and Amorphous materials, carving, lap materials
CO2: Explain Polariscope, Dichroscope, mineral crystallization, Mineral groups, Gem nomenclature, gem structure chart
CO3: Apply Moh scale for crystals, Gas crystallization, natural and man made gems, Faceting style, medical field
CO4: Distinguish types of tests on gems, pearl, emerald, diamond and colored stones, round cut and step cut, weights and measure
CO5: Justify acid test, durability of crystal, rock formation, organic and inorganic cushion shapes, standard gem sizes.

18UPHC61 QUANTUM MECHANICS AND RELATIVITY

Course Outcomes
On successful completion of the course, the learners should be able to
CO1: Define De Broglie wavelength, eigen values and functions, free particle, frame of reference, rest energy
CO2: Derive Planck's law of radiation Schrodinger equation, particle in a box, principle of relativity, mass energy equivalence
CO3: Utilize Planck's law of radiations, properties of the wave functions, finite square well potential, Galilean transformation, Einstein's postulates
CO4: Analyze inadequacy of classical mechanics, orthogonal wave functions, ether hypothesis, barrier penetration problems, addition of velocities
CO5: Importance of De Broglie waves, Schrodinger wave equation time dependent and independent, Michelson Morley experiment, Lorentz transformation equations

18UPHC62 DIGITAL ELECTRONICS

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Understanding of number systems, Boolean functions, logic gates, flip flops and Sequential Circuits.

CO2: Applying Binary number system to Sequential Circuits.

CO3: Synthesis of Boolean functions, simplification and construction of digital circuits by employing Boolean algebra.

CO4: Synthesising and simplifying the Boolean equations for Sequential Circuits

CO5: Constructing logic gates, flip flops, adders, subtractors, multiplexer, encoder, decoder, Astablemultivibrater using IC 555, D/A and A/D converters.

18UPHE61 NANOPHYSICS

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Understand the energy band, synthesis of nano material, basic principle of electron Microscope structure of nano material, application of nanomaterial.

CO2: Application of electrical conduction in metals, lithographic peocers and its limitations Scanning electron microscope, X-ray diffraction medicine energy sector**.**

CO3: Analyse the free electron model preparation of Nanomaterial, X-ray analysis, types types of method-next generation computer.

CO4: Evaluate electron transport in semiconductors, Molecular beam epitaxy, Transmission electron Microscope, X-ray line shape analysis, water purification

CO5: Develop idea on low dimensional system, other process, other microscope, small angle x- ray Scattering

18UPHE62 MEDICAL INSTRUMENTATION

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Recalling and Understanding concepts of the basics of electrode, colorimeter, Shortwave, Microwave, ultrasonic waves

CO2: Differentiate the Electrode types, Internal and External Defibrillators , Single channel, multichannel telemetry system, Thermograph , Endoscopes ,Lasers in Medicine , Computer Tomography

CO3: Build the knowledge in the field of Electro Cardiography , Electromyography , Respiratory Rate Measurement , Dializers , Nuclear imaging Techniques , Physiological monitoring system in space station

CO4: Utilization of Micropipet , Blood cell counter, Pacemakers, Electro Surgical Diathermy , Telemedicine.

CO5: Influence of Electro Oculography , oxygenerators , Cryogenics Applications , Design of Bio Telemetry , Pulse measurement

18UPHE63 OPTOELECTRONICS AND FIBREOPTIC COMMUNICATION

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Understand multimode fibre, losses in fibre, LED materials, optical couplers, fibre optic sensors

CO2: Illustrate propagation of light in an optical fibre, bending losses, PN junction photo detector, splicing procedure, Ruby laser

CO3: Justify acceptance angle and cone, waveguide dispersion, photodiode, photo transistor, bi-conically tapered directional coupler, transmitter for communication

CO4: Importance of optical fibre, dispersion techniques, semiconductor laser diodes, offset butt-joint directional coupler, fibre based modems

CO5: Classify step index fibre, gradded index fibre, glass fibre and Plastic fibre, PIN photo diode ,Avalanche photo diode, beam splitting and bi-conically tapered directional coupler

18UPHCP3 NON – ELECTRONICS PRACTICAL

Course Outcomes
On successful completion of the course, the learners should be able to
CO1: Understand the function of instruments like spectrometer and spot galvanometer
CO2: Relate and analyse angle of incidence and emergence
CO3: Find wavelength of light and particle size using laser
CO4: Compare the impedance and power factor of LR and CR circuits
CO5: Justify, Bridge circuits, Grating, LCR circuits

18UPHCP4 ELECTRONICS PRACTICAL

Course Outcomes
On successful completion of the course, the learners should be able to

CO1: Understand functions of operational amplifier, Half adder, Full adder
CO2: Show the various Rectifier circuit, Diode, Transistor characteristics
CO3: Use various stages of amplifier circuits and oscillator – Frequency
CO4: Learn the circuit connections using various electronic components by individual soldering method
CO5: Interpret Cathode Ray Oscilloscope, Trainer Board Circuits,8085 Microprocessor

18UPHPR1 PROJECT

18UPHS61 **BASICS IN MICROPROCESSORS**

Course Outcomes

On successful completion of the course, the learners should be able to

CO1: Define address bus, instruction, looping, counters and time delays and stack

CO2: Describe Pins and signals, logic instruction, 16 Bit arithmetic instruction, loop technic, traffic signal control program

CO3: Write Architecture of microprocessors, Branch instruction. Arithmetic operations related to memory, time delay one register loop, subroutine

CO4: Functioning of bus organizations, addressing modes, looping counting and indexing,

CO5: Assess microprocessors operations, Data transfer instruction, Arithmetic operations, time delays and counters, subroutine program, Counter design with time delay.