PROGRAMME AND COURSE OUTCOME

SUBJECT- PHYSICS

PROGRAMME OUTCOME	The curriculum in the subject of physics (six semester course) prepare student for positions as • Assistant scientist in many research area • Lecturer in school education • UPSC Geoscientist and other government sector service • Officer jobs in Railway, SSC, banking sector, etc.... • M.Sc. and research in physics • Lab supervisor and technician
PROGRAMME SPECIFIC OUTCOME	• To have knowledge of various type of motion • To know concept of Electricity and Magnetism • To understand optical phenomena and their applications • To study the thermodynamics and heat conversion • To study modern physics and advanced research work • To have knowledge about absorption and emission spectra.

COURSE OBJECTIVE	OUTCOME
MECHANICS-1	STUDY OF SCALAR AND VECTORS, CURL AND DIVERGENCE OF A VECTOR FIELD, GRADIENT OF A SCALAR FIELD,GAUSS'S DIVEGENCE THEOREM,STOKES'S THEOREM AND THEIR APLICATION,COORDINATE SYSTEMS, MOMENTUM AND ENERGY CONSERVATION,ROCKETS EQUATION OF MOTION,ROTATIONAL DYNAMICS OF SYSTEM,MOMENT OF INERTIA OF A VARIOUS BODIES,CENTRAL FORCE PROBLEM,ELASTICITY AND REALATION BETWEEN ELASTIC CONSTANT
ELECTRICITY AND MAGNETISM-1	ELECTROSTATIC FIELD, APPLICATION OF GAUSS THEOREM, DIVERGENCE AND CURL IN ELECTROSTATIC FIELD, ELECTRIC POTENTIAL,ENERGY STORED IN ELECTROSTTIC FIELD,LAPLACE AND POSSION'S EQUATION FOR THE ELECTROSTATIC FIELD,DIELECTRIC MEDIUM,STUDY OF CAPACITOR,MAGNETOSTATICS FIELD AND ITS APPLICATION,DIVERGENCE AND CURL OF MAGNETIC FIELD,MANETIC VECTOR POTENTIAL,VARIOUS MAGNETIC MATERIALS,MAGNETIC PROPERTIES OF MATERIALS, MAGNETIC SUSCEPTIBILITY
MECHANICS-2	CONSTRAIND MOTION, DEGREE OF FREEDOM AND GENERALIZED COORDINATES, HAMILTONIAN'S VARIATIONLAL PRINCIPLE, LAGRANGIAN'S EQUATION OF MOTION, SIMPLE HARMONIS OSILLATIONS WITH EXAMPLE,DAMPED OSCILLATIONS AND FORCED OSCILLATIONS,GALILEAN TRANSFORMATION AND ITS INADEQUACY,MICHELSON-MORLEY EXPERIMENT AND ITS OUTCOMES,POSTULATES OF SPECIAL THEORY OF RELATIVITY,APPLICATION OF RELATIVITY
ELECTRICITY, MAGNETISM &ELECTROMAGNETIC THEORY-2	FARADAY'S LAW OF ELECTROMAGNETIC INDUCTION, SELF AND MUTUAL INDUCTION,AC CIRCUIT ANALYSIS USING COMPLEX VARIABLE,SERIES AND RESONANCE CIRCUITS,QUALITY FACTORS AND ITS IMORTANCE,MAXWELL'S EQUATIONS,POYNTING THEOREM AND POYNTING VECTORENERGY DENSITY IN ELECROSTATIC FIELD,WAVE EQUATIONS FOR E AND B,SCALAR AND VECTOR POTENTIAL FOR ELECTROMAGNETIC FIELD,GAUG TRANSFORMATION, COULOMB GAUGE AND LORENTZ GAUGE,MAGNETISM AS RELATIVITY

COURSE OBJECTIVE	OUTCOME
HEAT AND THERMODYNAMICS	THE BASIC CONCEPTS OF THERMODYNAMIC LAWS, CONVERSION OF WORK INTO HEAT AND HEAT INTO WORK, CONCEPT OF ENTROPY, BASIC OF HEAT ENGINE, MAXWELL RELATION AND APPLICATION
SEMICONDUCTOR DEVICES	THE BASIC OF SEMICONDUCTOR DEVICES. PN JUNTION DIODE, ZENER DIODE, ZENER AS VOLAGE REGULATOR, BIPOLAR JUNCTION TRANSISTOR(BJT), TRANSISTOR AS AN AMPLIFIER, OP AMP AS DIFFERENTIATOR AND INTEGRATOR
STATISTICAL MECHANICS	BASIC OF STATISTICAL MECHANICS, FUNDAMENTAL POSTULATE, KINETIC THEORY OF GASES, BOSE EINSTEIN STATISTIC, FERMI DIRAC STATISTIC AND GIBBS PARADOX
WAVES AND OPTICS	CONCEPTS OF TRANSVERSE AND LONGITUDINAL WAVES, YOUNG DOUBLE SLIT EXPERIMENT. CONCEPTS OF REFRACTIVE INDEX, VARIOUS TYPE OF DIFFRATION, ZONE PLATE. BASIC IDEA OF LIGHT PROPAGATION THROUGH OPTICAL FIBRES.

COURSE OBJECTIVE	OUTCOME
QUANTUM AND LASER PHYSICS	ORIGIN OF QUANTUM PHYSICS, PHASE VELOCITY , GROUP VELOCITY, HEISENBERG UNCERTAINTY PRINCIPLE, DE BROGLIE'S HYPOTHESIS, T.D and T.I SCHRODINGER WAVE EQUATION. MAIN FEATURE OF LASER, EINSTEIN COFFICIENTs. A NECESSARY CONDITION FOR LIGHT AMPLIFICATION, LASER PUMPING , THRESHOLD CONDITION FOR LASER EMISSION, HE-NE LASER, RUBY LASER, SEMICONDUCTOR LASER APPLICATION
NUCLEAR PHYSICS	NUCLEAR STRUCTURE AND PROPERTIES, CONCEPT OF BINDING ENERGY, NUCLEAR STABILITY, NUCLEAR RADIATION DRCAY PROCESS. INTERACTION OF HEAVY AND LIGHT CHARGED PARTICLE WITH MATTER, NUCLEAR ACCELERATOR NUCLEAR DETECTOR, NUCLEAR REACTION
SOLID STATE AND NANO PHYSICS	CRYSTAL STRUCTURE, BRAVIS LATTICES IN 2-D AND 3-D, CRYSTAL PLANE , MILLER INDICES, INTERPLANER SPACING, X-RAY DIFFRACTION, RECIPROCAL LATTICE(S.C. FCC BCC), SUPERCONDUCTIVITY: TYPE1 TYPE 2 , BCS THEORY, APPLICATION OF SUPERCONDUCTOR, INTRODUCTION TO NANO PHYSICS, UNDERSTANDING ADVANCED CAPABILITIES VISION AND OBJECTIVE OF NANO TECHNOLOGY
ATOMIC AND MOLECULAR SPECTROSCOPY	EMISSION AND ABSORPTION SPECTRA, SPECTRA OF H-ATOM, WILSON SOMMERFELD QUANTIZATION RULE,SPACE QUANTIZATION, ELECTRON SPIN, COUPLING OF ORBITAL AND SPIN ANGULAR MOMENTUM, SPECTROSCOPY TERMS, TRANSACTION PROBABILITY AMD SELECTION RULE, VECTOR ATOM MODEL, L-S AND J-J COUPLING, ATOM IN EXTERNAL FIELD, ZEEMAN EFFECT, PACHEN BACK EFFECT, STARK EFFECT, MOLECULAR PHYSICS, ROTATIONAL AND VIBRATIONAL SPECTRA, RAMAN EFFECT, ELECTRONIC SPECTRA.