Syllabus
for
Geophysics (SCQP15)

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PHYSICS:

- **Mechanics and wave Motion: -**

    Gallilean invariance, Inertial, noninertial and accelerated frame. Principle of equivalence, Various forces and energy considerations in motions of plants and satellites, conservation of linear momentum, variable mass, Moment of Inertia, Kineticenergy, Radius of gyration, Conservation of Angular momentum, Beats, Lissajous figures LCR circuits, Resonance, Fourier series.

- **Electromagnetic Theory and Electronics: -**

    Maxwell's equations, Displacement current, travelling waves, E M Fields in coaxial cable, Poynting vector, Progagation of e.m. waves. Semiconductors, P-n junction, transistor, Rectifiers, Filters, Common Emitter voltage amplifier.

- **Optics: -**

    Newton's rings, Michelson's interfer ammeter, coherence, Lasser, Fresnel and Franhoffer diffraction, and diffraction patterns, Polarisation, Brewster's Law, Optic axis, Nicol Prism, Huygen's theory of double diffraction.

- **Thermodynamics and statistical Mechanics: -**

    Entropy, Reversible and irreversible process, S.T. diagram, Enthalphy, Helmholtz and Gibb's functions, Maxwell's and T-ds equations, Energy and Heat capacity equations, Clausiusclapeyron equations, specific heat, Thermodynamics,
    Black body radiations, Laws of radiation, Temperature of the Sun, Planek's radiation formula, Photo-electric effect, Crompton effect, Raman Effect, Duality, Michelson- Morley experiment.

MATHEMATICS:

Algebra:

- Partial fractions, inequalities, Theory of equations, algebra of matrices, properties of determinates and its application to solve linear simultaneous equations,

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Trigonometry:

- De Moivre's theorem, logarithms of complex quantics and expansion of functions.

Calculus:

- Successive differentiation, asymptotes, curve tracing, curvature, maxima and minima, partial differentiations in determinate forms, mean value theorems, integration and reduction formulae and evaluation of area. Volume, surface and lengths.

Geometry:

- Hyperbola in rectangular coordinates, polar equation of a conic, general equation of second degree, confocal and system of conics, straight lines, plane, sphere, cone , cylinder and central conecoidsin three dimensions.

Vectors:

- Divergence, grade and curl of vectors, Gauss, Stokes and Green's theorems with their applications,

Differential equations:

- Linear differential equations with constant coefficients, orthogonal trajectory, simple non linear differential equations, Integral equations and solution of linear differential equations using Laplace transform.

Mechanics:

- Forces in two dimensions, Virtual work, catenary, Center of gravity, friction, S H M, Projectiles, constrained motion, moments and product of inertia, equation of motion of a rigid body, D Alembert's principle, compound pendulum, conservation of energy and momentum, centre of pressure and laws of floatation.