

SYLLABUS :-

Canonical Quantization, Elements of classical field theory ; symmetries and Noether s theorem ; solitons ; canonical quantization ; creation-annihilation operators; quantization of Klein-Gordon field and Dirac field; discrete symmetries of the Dirac theory; interacting fields - perturbation theory, Wick s theorem, Feynman diagrams, cross sections and S-matrix, S-matrix elements from Feynman diagrams, Feynman rules for QED ; elementary processes of QED ; Compton scattering ; non-perturbative methods - field and mass renormalization ; LSZ reduction formula ; renormalized charge and Ward Identities. Path Integrals Functional methods - path Integrals in quantum mechanics, functional quantization of scalar fields, correlation functions, Feynman rules, functional derivatives and generating functional, QFT and statistical mechanics, quantization of the electromagnetic field, functional quantization of spinor fields.