

SYLLABUS :-

Renormalization ,Counting of ultraviolet divergences; dimensional regularization ; one-loop structure of ϕ^4 theory ; one-loop radiative corrections in QED - vacuum polarization, anomalous magnetic moments, electron self energy; cancellation of divergences; renormalization beyond leading order; infrared effects - soft photons; Renormalization Group - the Callan-Symanzik equation, evolution of coupling constants. Non-Abelian Gauge Theories Yang-Mills Lagrangian ; quantization of non-Abelian gauge theories; Faddeev-Popov Ghosts and unitarity ; BRST symmetry ; asymptotic freedom ; QCD ; spontaneous symmetry breaking , Goldstone theorem; Higgs mechanism; Glashow-Salam-Weinberg Theory; Grand Unification.