

PHY781 — High Energy Physics. Units : 3-0-0-9

Instructor: Joydeep Chakraborty

Prerequisite : Quantum Field Theory-I(PHY681),
Mathematical Methods-I (PHY422).

Course Contents:

1. Standard Model of Particle Physics :
gauge invariance, chiral symmetry, spontaneous symmetry breaking, Higgs mechanism, Fermion mass generation, Deep Inelastic Scattering, Precision measurements, Experimental evidences. (5)
2. Why beyond Standard Model? Possible way out. (5)
3. Path Integral and gauge theory quantisation. (10)
4. Anomaly. (5)
4. Renormalisation and Renormalisation Group Evolutions. (10)
5. Effective Field Theory. (5)

Course Evaluation: There will be end sem exam for this course. I will assign individual projects. Students have to present two talks : one at the mid-sem, and other one at the end-sem. Each of you have to submit an end-sem project reports (max 6 pages).

Final evaluation will be based on the project reports and end sem marks.

Attendance: 90% attendance is compulsory.

References:

1. Gauge theories in Particle physics : Aitchison and Hey (Volume I+II).
2. Classical Theory of Gauge fields: Rubakov
3. The theory of Quark and Gluon Interactions: Yndurain
4. An Introduction To Quantum Field Theory : Peskin and Schroeder