

# PHY681 (Quantum Field Theory)

Instructor: Dipankar Chakrabarti. [2017-18, First semester]

It will be an introductory course on Quantum Field Theory(QFT). Students should have knowledge on quantum mechanics. The plan of the course is as outlined below:

1. Preliminaries of QFT.
2. Space-time in QFT, Lorentz invariance.
3. Action principle, Euler-Lagrange equations, Noether's theorem.
4. Canonical quantization of fields :
  - (a) Scalar fields: real and complex scalar fields
  - (b) Dirac fields and
  - (c) Gauge fields
5. S-matrix, Wick's theorem.
6. Feynman diagram, Feynman rules.
7. Tree level calculations in QED.

## Books:

1. Quantum Field Theory- Peskin and Schroeder
2. Quantum Field Theory - Lahiri and Pal
3. Quantum Field Theory - Mandl and Shaw.

## Evaluation:

Quizzes( $4 \times 15$ ): 60 marks

Project : 60 marks.