Outline

Lecture 1

1. Notation and units.
2. Concept of center-of-mass system, 4-vectors
3. Lorentz transformation and some of the invariant quantities, Mandelstam variables
4. Creation and annihilation operators.

Lecture 2

1. Transition of states and Fermi's Golden rule.
2. Phase-space integral.
3. Calculation of decay rate.
4. Definition of cross-section.
5. 2-body scattering in lab and CM frames.

Lecture 3

1. Fixed target experiment
2. Asymmetric collider
3. Rapidity and pseudorapidity variables
4. Deep inelastic scattering.