Reference Text Books:
1- *Modern Elementary Particle Physics*. Author: Kane.
2- *An Introduction to Quarks and Partons*. Author: F. E. Close
3- *Quantum Field Theory*. Authors: F. Mandl and G. Shaw.
4- *Foundations of Quantum Chromodynamics*. Author: T. Muta.

Topics:
Lagrangians, Currents and Interactions.
Lie algebra and SU(N) groups.
Constituent Quark Model.
U(1) Gauge field theory.
Yang-Mill Gauge field Theory.
Gauge Theory of Weak Interactions.
Spontaneous Symmetry Breaking.
Gauge Theories and QCD.

Tests:
Two tests and a final exam which will be cumulative.

Grades:
- Homework: 20%
- Test 1: 20%
- Test 2: 20%
- Final :40%

Prerequisite:
Physics 5100 or 5300.