

Villanova University
Department of Physics
Particle Physics
Instructor: Dr. Farid Zamani

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.