

PHY 917 (Sec. 302): Introduction to Elementary Particle Physics

Time & Place:

Spring 2011, 10:20am - 12:10pm, Tuesday and Thursday,
Room 1308 in BPS Bldg.

Instructor:

Name & Title: C.-P. Yuan, Professor
Office: 3213 Biomedical & Physical Sciences Bldg.
Department of Physics and Astronomy
phone: (517) 884-5559
E-mail: yuan@pa.msu.edu
Office Hours: 3:00pm – 4:30pm, Mondays
(Or you can just drop by my office at any time.)

Textbook:

Required:

David Griffiths *Introduction to Elementary Particles*
(ISBN: 978-3-527-40601-2, Wiley-VCH)

Recommended (not required):

Steven Weinberg *The First Three Minutes*
(ISBN: 0-465-02437-8, BasicBooks)

Particle Data Group, *The Review of Particle Physics*
<http://pdg.lbl.gov/>

Topics To be covered:

Introduction and Particle Discovery Timeline
Quantum Electrodynamics and precision data
Beta decay, neutrino and weak interaction theory
Zoo of hadrons, quark model and strong interaction
Higgs mechanism (spontaneous symmetry breaking)
Standard Model of elementary particle physics
Discovery of charm, beauty, and top quarks
Discovery of W and Z bosons
Search for Higgs boson
Grand unified theory and proton decay
Supersymmetry and dark matter candidate
Extra Dimension models
Anti-matter in cosmic rays
Big bang, early universe (the first three minutes)
Relic density and dark matter
Solar neutrino problem and neutrino oscillation

Grading: Reports on team projects (100%)