

From: <dieter@pheno.physics.wisc.edu>
To: buehlman@facstaff.wisc.edu
Cc: dieter@pheno.physics.wisc.edu
Subject: Re: Syllabuses still missing
Date: Tue, 05 May 98 11:20:57 +0100
X-Mts: smtp

Hi Jean,

I'm not sure I sent you this before.

Dieter

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735: Particle Physics (Dieter Zeppenfeld, Spring 98)

Lecture: TR 9:30-10:45 in 5280 Chamberlin Hall

NOTE change of location !!!!!!!!

Grade requirements:
 weekly/biweekly homework problems
 (problems will be graded) 60%
 final take-home exam 40%

Office hour: any time I'm in 5287 Chamberlin (except 1 hour before classes)

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Syllabus: the course will closely follow the textbook
Halzen & Martin: Quarks and Leptons, an introductory course in
modern particle physics, John Wiley and Sons

- 1) Introduction
 - from atoms to quarks and leptons
 - interactions and gauge bosons
 - particle spectroscopy
 - scattering processes as a microscope

- 2) Symmetries and quarks: the old quark model
 - SU(2) and flavor SU(3)
 - some group theory
 - representations
 - mesons and baryons from group theory of quark flavors

Elements of Field Theory: Chapters 3--7

Antiparticles
Klein Gordon eq.

Dirac eq., gamma matrices, spinors
Electrodynamics of spin 0 and spin 1/2 particles
Feynman graphs
invariant amplitudes
loops

8) The structure of hadrons
electron proton scattering
structure functions

9) Partons within the proton
deep inelastic ep scattering

10) Quantum Chromodynamics
gluons as partons and force carriers
gluon emission
Altarelli Parisi eq.

11) e^+e^- annihilation
production of hadrons
heavy quark thresholds
three jet events

Electroweak Interactions

W and Z as massive vector fields
coupling to fermions: V-A
Feynman rules
 e^+e^- annihilation on top of the Z resonance

12,13) weak interactions

low-energy effects: beta-decay, muon decay etc.
photon Z interference in $e+e^-$ annihilation

14) Gauge symmetries

Lagrangians

Symmetries and Conservation Laws

Nonabelian gauge symmetries

spontaneous symmetry breaking: the Higgs mechanism

15) The Weinberg Salam model