Elementary Particles II

Organization, Contents, Comments

Academic Year 2020-2021

Logistics & Human Resources

Time

Monday 11-13, Thursday 14-16, Friday 13-15

Place

Monday : Aula A, Thursday, Friday: Aula D

But: Watch for changes..

People

E.Menichetti – Lectures

Organization

6 CFU Course ~ 48 h

Exam Requirements
Oral examination
(Will include a 15’ oral presentation on some agreed subject)

Exam Dates
Upon individual request

Course Web Page

http://personalpages.to.infn.it/~menichet/Particelle2-2021

Background

Required basic familiarity with:

[Special Relativity
Quantum Mechanics
Introductory Nuclear & Particle Physics]

Relativistic Quantum Mechanics
Accelerators and Detectors
Introductory Quantum Field Theory
First Half of Elementary Particle Physics

Contents

QCD

Color Gauge Theory, Gluons, Color Interaction, Asymptotic Freedom, Confinement, Perturbative QCD, Quarkonia

Electroweak Interaction

Fermi Theory, Unitarity Violations, Intermediate Vector Boson, Electroweak Unification, Neutral Currents, Spontaneous Symmetry Breaking, Discovery of W and Z, Tests of the Standard Model

Neutrino Physics

Key Points

Guidelines:

Little interference with the (many) theoretical courses
'Experimental/Phenomenological', whatever it means

Difficult task (for both students *and* teacher):

Experimental particle physics is notoriously difficult to either teach or learn in a classroom

Today's large experiments and machines operating conditions are quite far from common experience, filled with extreme technology, sometimes hard to understand at first contact

Goal definitely worth the effort:

Exploration, Validation and Extension of the SM

One of the most exciting intellectual challenges available on the market