UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Theoretical Physics II

2122-1-F1701Q100

Aims

Introduction to the Standard Model of Fundamental Interactions

Contents

The standard model of fundamental interactions

Detailed program

Radiative corrections of QED
Charge, mass and WF renormalization, Ward identity
Infrared divergence
Regularization
Dimensional regularization
Anomalous magnetic moment of the electron
The weak interaction
Four point Fermi interaction
Parity violation and the Wu experiment
Muon and Neutron decay
Higher orders, non renormalizability, IVB hypothesis
Symmetries and Gauge theories
Global and local symmetries
Yang-Mills interaction
U(1) gauge symmetry
SU(2)xU(1) gauge symmetry
A gauge theory for the weak interaction
Glashow model

Gauge leptons and bosons
Spontaneous symmetry breaking
Goldstone theorem
Brout-Englert-Higgs phenomenon
The electroweak lagrangian

Prerequisites

Fisica Teorica I

Teaching form

Lessons

Textbook and teaching resource

F. Mandl, G. Shaw, Quantum Field Theory, II Ed.
L. Maiani, Electroweak Interacions, CRC Press
M.D. Schwartz, Quantum Field Theory and The Standard Model
M.E. Peskin, D.V. Schroeder, An Introduction to Quantum Field Theory
T-P Cheng, L-F Li , Gauge theory of elementary particles

Semester

I semester

Assessment method

Esame orale

Office hours

On request