

# Particle Physics 1 - 2011

The first year master course “Particle Physics 1” will take place in room N328 at Nikhef. Below is some practical information.

## Teachers

Lecturer: Marcel Merk  
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Assistant: Alexandr Kozlinskiy  
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## Literature

The Standard Book for the lectures is:

Halzen & Martin: ”Quarks & Leptons: An Introductory Course in Modern Particle Physics”. This book is a bit dated (1984), but is still very good.

There is now a new, second edition of the book: Griffiths: Introduction to Elementary Particles. This book is a bit less formal but contains a few more modern topics.

The course can be followed with either of the two above books. Lecture notes will be made available.

## Contents

The contents of the course is shortly described on my personal webpage:  
<http://www.nikhef.nl/~i93/Teaching.html>

The course contains the following topics:

- Relativistic wave equations
- Scattering perturbation theory
- Electromagnetic scattering of spinless particles
- The Dirac equation
- Electromagnetic scattering of spin 1/2 particles
- The weak force

- Local gauge invariance
- Massless electroweak standard model

## Required knowledge

- Relativistic Kinematics
- Maxwell Equations
- Quantum mechanics:
  - \* Schrödinger equation
  - \* Angular momentum and spin

## Further Information

There are 12 lectures that take place each Monday and Wednesday morning from 9h30 - 13h00. The first lecture will be on Monday September 5; the last lecture will be on Wednesday October 12, then there is one week time to study for the exam on Wednesday October 26.

## Examination

The final mark of the course will be calculated as follows:  $1/3$  \* homework exercises +  $2/3$  exam.

The exam will take place on Wednesday October 26 from 9h30 - 13h30, in room Z009. It is an open book exam, bring any books and notes but no laptop. The homework will be rated from 1 to 10 each week, with 2 bonus points if the exercises are handed in within one week.