Introduction to Elementary Particle Physics 2

Lectures and Seminars: Tuesday 10^{00}–12^{00} FF 511 and Thursday 11^{00}–13^{00} FF 510

09/02 Introduction; discussion of homework and seminar talks;
Overview about hadronic boundstates: Schrödinger equation (reminder about QM);

09/04 Fermions as solutions to the Dirac equation (i.e. chapter 7)

09/09 Special Relativity – refreshing EPP1: Calculating in SR
Exercises 7.1 Dirac spinors: 7.3 – 7.9

09/11 Presentation from students (optional) of exercise 6.4
Application of Feynman Rules: Overview
Feynman Rules – refreshing EPP1: diagrams → rules

09/16 no lecture: conference in Katowice

09/18 no lecture: conference in Katowice

09/23 Presentations from students for Chapter 5: hadronic boundstates

09/25 Presentations from students for Chapter 5: hadronic boundstates

09/30 Kinematics: Fermi's Golden Rule for Decay and Scattering

10/02 Feynman Rules: ABC theory
Feynman Rules – generalizing to more complicated structures: fermions, vectors

10/07 Exercises for scalar theories (=kinematics): 6.7 – 6.15

10/09 Exercises for scalar theories (=kinematics): 6.7 – 6.15

10/14 no lecture: CERN Baltic Conference in Kaunas

10/16 no lecture: CERN Baltic Conference in Kaunas

10/21 Exercises 7.3 γ-matrices

10/23 Exercises 7.1 Dirac spinors: 7.11 – 7.24

10/28 Exercises 7.2 Electrodynamics

10/30 Exercises 7.4 QED matrix elements

11/04 Exercises 7.5 Casimir's trick

11/06 Exercises catch-up, Questions

11/11 Exercises 8.1 Quark scattering (at least 8.4 and 8.5)

11/13 color matrix element; Exercises 8.2 Color

11/18 Exercises 8.2 Color; discussion and catch-up

11/20 Discussion Weak Interactions – reminders / presentations (?)

11/25 Exercises 9 and 9.1

11/27 Exercises 9 and 9.1

12/02 The electroweak Standard Model

12/04 The electroweak Standard Model

12/09 Discussion and Catch-up

12/11 Discussion and Catch-up

12/16 Discussion and Catch-up

12/18 Discussion and Catch-up

> 12/19 Exam

Attendance required;

Homework suggested; will count towards the grade; less credit for late homework;

Grading: 100 points = 100%,

40	homework and presentation of homework
10+	seminar presentation and attendance: meaning active participation
50	final exam: written and oral; 50% required to pass the course.

email: `tgajdosik@yahoo.com` **NTFMC A431**

webpage: `http://web.vu.lt/ff/t.gajdosik/epp-2/` (will be updated)

Books are available

Seminar presentation

The idea of the presentation is to involve the students into the discussion about particle physics and related areas.

The student chooses a subject for the presentation and clarifies with me, if the subject is suitable or not. If it is suitable the student will get a time during the lecture to present the subject to the fellow students. The presentation can be given in English or in Lithuanian. The presentation should be rather short, i.e. about 5 minutes, and it has to be presented using the computer.

- The presentation has to be prepared in a computer readable format:
  - **.pdf** is recommended
- The presentation should be given orally. It is recommended, that the student does not just read a text, but explains the subjects freely in his own words.
- The student should be able to answer questions from his fellow students. That does not mean, that he has to have all the answers.

The presentation helps also practicing the necessary presentation of the bachelor thesis at the end of the students bachelor studies.

Homework

Without calculating some problems any lecture in theorectical physics remains a fairy tale. In that sense the homework is required to profit from this lecture. The solving of problems helps to understand, whether the student has understood the material or not. At the exam it is too late to recognise, that one has not learned the required material.

The students are invited to come before the homework is due to discuss the problems and ask. I will gladly help them to understand the problem and guide them to the solution. The best way to arrange for a meeting is to write an email to arrange a time, as I can not guarantee that I will have always immediately time for the questions or that I will be always in my room (NTFMC A431).

I plan to give less points for homework that is brought much later than its due date. It will nevertheless help to do the homework, even if it is late, as the exam will have questions and problems to solve similar to the home, too.

Exam

The exam will be a written test, that I want to discuss afterwards with the student.