

SCHEDULE FOR FYSC14: HIGH ENERGY PHYSICS AND ACCELERATORS AUTUMN 2013 v4 December 2nd 2013

This schedule and material can be found at:

<http://www.hep.lu.se/staff/christiansen/teaching/>

and is linked to from the official course homepage:

<http://www.utbildning.fysik.lu.se/tibet/template/personal%2CIndex.vm?pageid=241426&siteid=1000>

Compulsory elements:

Monday 4/11 (introduction)

Thursday 25/11 (lab-prep)

Lab period 2 (separate 2.5 hp grade)

Two written assignments to be handed in (25% of final 5 hp grade)

Oral exam (75% of final 5 hp grade)

All partial elements of the course: written assignment 1+2, lab, oral exam, DESY trip have to be passed for the course to be passed.

A final grade (U, G, VG) combining all grades and a percentage will be provided.

Monday 4/11 8-10 + Tuesday 5/11 10-12 (Peter+Else): Introduction and four vectors

Suggested reading: chapter 1, section 7.3, chapter 1 of Leif's notes, A.1, A.2.

Suggested exercises: 1.2, 1.3, 1.6

Wednesday 6/11 8-10 (Peter): Leptons and the weak interaction

Suggested reading: chapter 2.

Suggested exercises: 2.1, 2.2, 2.4

Thursday 7/11 10-12 (Peter): Quarks and hadrons

Suggested reading: chapter 3.

Suggested exercises: 3.1, 3.2, 3.4

Friday 8/11 8-10 (Peter): Accelerator lectures 1/6+2/6

Exercise 1 is handed out/made available on the web.

Suggested reading: chapter 4 + B.1, B.2, B.3 + course material at the web page.

Suggested exercises: 4.1, 4.2, 4.3

Monday 11/11 10-12 + ~~Wednesday 13/11 10-11 (canceled)~~ + Thursday 14/11 8-9 (Peter): Accelerator lectures 3/6+4/6+5/6+6/6

Suggested reading: course material at the web page.

Please note that Tuesday 19/11 is dedicated to student presentations on selected topics and 1 hour

Wednesday 12/11 (11-12) is set aside for preparing these.

~~Tuesday 12/11 8-10 (canceled)~~ Friday 15/11 10-12 + Monday 18/11 8-10 (Else):

Detectors in high energy physics

Suggested reading: chapter 4.

Suggested exercises: 4.5, 4.7, 4.9

Thursday 14/11 8-9 + Tuesday 19/11 11-12 (Peter): the quark model

Suggested reading: chapter 6 (chapter 5 is skipped).

Suggested exercises: 6.1, 6.2, 6.4 (6.4 is covered in class)

Tuesday 19/11 11-12 (Peter): student projects presentations

We will keep going till after 12 even to finish all presentations if necessary.

Wednesday 20/11 8-10 (Peter): QCD, jets and gluons

Suggested reading: chapter 7

Suggested exercises: 7.4, 7.7

20/11: exercise 1 have to be handed in.

Thursday 21/11 10-12 + Friday 22/11 8-10 (Else): Weak interactions: quarks and leptons

Suggested reading: chapter 8

Suggested exercises: 8.1, 8.2, 8.3 (8.2 and 8.3 goes together), 8.4, 8.5

Monday 25/11 8-11: Compulsory lab introduction

Tuesday 26/11 10-12: Exercises are returned

Tuesday 26/11: exercise 1 is returned and exercises are explained (10-11).

Tuesday 26/11: exercise 2 is handed out.

The last lesson 11-12 is a buffer.

Lab-period 2

Friday 13/12: exercise 2 has to handed in (last day of the lab period!).

Monday 16/12 10-12 (Else): Summary + Electroweak Unification (Higgs)

Suggested reading: chapter 9

Note that Monday 16/12 from 13-17 there is the compulsory data analysis part of the particle physics lab.

Tuesday 17/12 8-10 (Else): Symmetries in Particle Physics and **exercise 2 is returned and explained (9-10).**

Suggested reading: chapter 10

Suggested exercises: 10.1, 10.2, 10.3

Wednesday 18/12 10-12 (Else): Symmetries in Particle Physics and beyond the standard model

Thursday 19/12 8-10 (Else): Beyond the standard model and cosmology

Suggested reading: chapter 11 (11.1-11.4)

Friday 20/12 10-12 (Else): Summary and question session

A quiz and a test exam is organized.

10/1+13/1+14/1 2014: Oral exams

This is a compulsory element of the course and counts for 75% of the final score for the Particle Physics part.

16-18/1 2014: DESY trip

This is a compulsory element of the course. Students that cannot make the trip will get a special assignment on DESY