

**SCHEDULE FOR FYSC14:
HIGH ENERGY PHYSICS AND ACCELERATORS
SPRING 2013
v1.3 April 25th 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/FYSA31/kursens_innehall/high-energy-physics

Compulsory elements:

Tuesday 2/4 (introduction)

Thursday 18/4 (lab-prep)

Thursday 25/4 (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 ECTS grade will be provided.

Tuesday 2/4 + Wednesday 3/4: 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

Thursday 4/4: Leptons and the weak interaction

Suggested reading: chapter 2.

Suggested exercises: 2.1, 2.2, 2.4

Friday 5/4: Quarks and hadrons

Suggested reading: chapter 3.

Suggested exercises: 3.1, 3.2, 3.4

Optional student presentation Friday 5/4: A.3

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

Monday 8/4 + Tuesday 9/4 + Wednesday 10/4 + Monday 15/4: Accelerators.

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

Please note that Monday 15/4 is dedicated to student presentations on selected topics and 1 hour

Wednesday 10/4 (11-12) is set aside for preparing these.

Optional student presentation Tuesday 9/4: B.4

Suggested exercises: 4.1, 4.2, 4.3

Thursday 11/4 + Friday 12/4 + Tuesday 16/4: Detectors in high energy physics

Suggested reading: chapter 4.

Suggested exercises: 4.5, 4.7, 4.9

Wednesday 17/4: the quark model

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

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

Friday 19/4: QCD, jets and gluons

Suggested reading: chapter 7

Suggested exercises: 7.4, 7.7

19/4: exercise 1 have to be handed in.

Lund string model presentation (will be given 23/5 by Torbjörn Sjöstrand).

Monday 22/4 + Tuesday 23/4: 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 (done in class)

Tuesday 23/4: exercise 1 is returned and exercises are explained (10-11).

Tuesday 23/4: exercise 2 is handed out (it is since Today (21/4) available on the course web page).

Wednesday 24/4: Electroweak Unification

Suggested reading: chapter 9

ATLAS Higgs presentation (will be given 20/5 by Monika Wielers).

Friday 26/4: C and CP violation in weak decays

Suggested reading: chapter 10

Suggested exercises: 10.1, 10.2, 10.3

Lab-period 2

Friday 17/5: exercise 2 has to handed in (last day of the lab period!).

Tentative schedule after lab period 2:

Monday 20/5+Tuesday 21/5: Summary + Gauge symmetries

ATLAS Higgs presentation 20/5 by Monika Wielers.

Wednesday 22/5+Thursday 23/5: Cosmology and beyond the standard model

Suggested reading: chapter 11 (11.1-11.4)

Wednesday 22/5: exercise 2 is returned and exercises are explained (10-11).

Lund string model presentation (will be given 23/5 by Torbjörn Sjöstrand).

Friday 24/5: Summary and question session

29/5+30/5+31/5+3/6+4/6: Oral exams

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

The day 29/5 is mainly meant for people who do not take the solid state course.

6-8/6: DESY trip (dates to be confirmed)

This is a compulsory element of the course.