SCHEDULE FOR FYSC14:
HIGH ENERGY PHYSICS AND ACCELERATORS
SPRING 2014
v2 April 10, 2014

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:
Wednesday 26/3 (introduction)
Thursday 17/4 (lab-prep)
??? (lab-data analysis)
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.

Wednesday 26/3 13-15 + Thursday 27/3 15-17 (Peter+Else): Overview, four vectors, and Feynman diagrams
Suggested reading: chapter 1, section 7.3, chapter 1 and 2 of Leif's notes, A.1, A.2.
Suggested exercises: 1.2, 1.3, 1.6

Friday 28/3 13-15 (Peter): Leptons and the weak interaction
Suggested reading: chapter 2.
Suggested exercises: 2.1, 2.2, 2.4

Monday 31/3 15-17 (Peter): Quarks and hadrons
Exercise 1 is handed out/made available on the web.
Suggested reading: chapter 3.
Suggested exercises: 3.1, 3.2, 3.4

Tuesday 1/4 13-15 and Wednesday 2/4 15-17 (Peter): Accelerator lectures 1-4
Suggested reading: chapter 4 + B.1, B.2, B.3 + course material at the web page.
Suggested exercises: 4.1, 4.2, 4.3

Thursday 3/4 13-15 + Monday 7/4 13-15 (Peter): Accelerator lectures 5 and student presentations
Suggested reading: course material at the web page.
Thursday 3/4 13-14 ESS lecture by Mats Lindroos.
Monday 7/4 13-14 we will have student presentations.
Thursday 3/4 14-15 is set aside for preparing these.

Friday 4/4 15-17 + Tuesday 8/4 15-17 (Else): Detectors in high energy physics
Suggested reading: chapter 4.

Suggested exercises: 4.5, 4.7, 4.9

Wednesday 9/4 13-15 (Peter): the quark model
Suggested reading: chapter 6 (chapter 5 is not part of the curriculum).
Suggested exercises: 6.1, 6.2, 6.4 (6.4 is covered in class)

Thursday 10/4 15-17 (Peter): QCD, jets and gluons
Suggested reading: chapter 7
Suggested exercises: 7.4, 7.7
10/4: exercise 1 has to be handed in.

Friday 11/4 13-15 and Monday 14/4 13-15 (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

Tuesday 15/4 15-17: Exercises are returned
Tuesday 15/4: exercise 1 is returned and exercises are explained (15-16).
Tuesday 15/4: exercise 2 is handed out.
The last lesson 16-17 is a buffer.

Wednesday 16/4 13-15 (Else): Electroweak Unification and gauge theory
Suggested reading: chapter 9

Thursday 17/4 15-17: Compulsory lab introduction

Tuesday 22/4 15-17 (Else): The role of the Higgs in the standard model and how it was discovered at LHC
Suggested reading: chapter 9

Friday 25/4 13-15 (Vytautas): Special exercise session where

Lab-period 2
Wednesday 14/5: exercise 2 has to be handed in

Monday 19/5 15-17 (Else): CP violation
Suggested reading: chapter 9 & 10
Suggested exercises: 10.1, 10.2, 10.3

Tuesday 20/5 13-15 and Wednesday 21/5 15-17 (Else): Beyond the standard model and cosmology
Suggested reading: chapter 11 (11.1-11.4)
Tuesday 20/5: exercise 2 is returned and exercises are explained (13-14).

Thursday 22/5 13-15 (Peter+Else): Summary and question session
A quiz and a test exam is organized.

Friday 23/5 15-17: Contingency

27/5+28/5+2/6+3/6 2014: Oral exams

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

5-7/6 2014: DESY trip

This is a compulsory element of the course. Students that cannot make the trip will have to do a special written assignment on the research carried out at DESY