

ANALYTICAL MECHANICS

WINTER AND SPRING 2010

January 18 Action principles

January 20 How to solve the equations

January 25, 27 Lagrangians

February 1 Problem session: problems 1:1-3, 1:5, 2:1-2,4

February 3, 8 The two body problem

February 10 Problem session: problems 2:5-6, 3:1-2, 4-5

February 15 Rotations

February 17, 22 Rigid bodies

February 24 Problem session: problems 3:6, 4:1-5.

March 1 The Hamilton equations of motion

March 3 Tensors

March 5 Backtrack

March 10 Problem session: problems 4:8, 5:1-5.

March 12 Symplectic geometry

March 15 Poisson brackets and all that

March 17 Problem session: problems 5:5-6, 6:1-2.

March 22 Integrable and chaotic motion

March 24 Demonstrations of chaotic systems (Sara Rydbeck), and problem session (problems to be announced later) + overview of the course. Note that there are two lectures this day, 10-12 and 13-15.

March 27 Exam, 9-15 in FR4.

There are lectures notes covering most of what I talk about, available on my home page. They also contain the problems to be discussed in the problem sessions. The relevant chapters in Goldstein et al are 2 – 5 and 8 – 9, with a brief excursion into 10 – 12.

The lectures are in FB41, either at 10.15 (Mondays) or at 15.15 (Wednesdays).

For the students there are seven possible grades, “excellent”, “very good”, “good”, “satisfactory”, “enough”, “not enough”, and “not even close”. There will be a total of 6 exercise classes. Each time you will be encouraged to hand in two of the solutions in advance; a total of eight flawless (handwritten) solutions will increase your grade by one step (unless you receive the grade “excellent” on the exam).

The problems are those in my lecture notes. The bounus problems are: February 1 1:5 and 2:2, February 10 2:5 and 3:4, February 24 4:1 and 4:5, March 10 4:8 and 5:1, March 17 $5:6_{\text{old}} = 5:8_{\text{new}}$ and 6:1, March 24 to be announced later. (The new edition of the notes, from February 17, leads to the I hope obvious notation for March 17.)

The students are also supposed to grade their teacher, according to a scheme to be explained. Complaints about the course can be directed directly to me, or to Tor Kjellsson and Henrik Åkerstedt (“Kursforum”).

You are always welcome to my office, A5:1057, if you want to discuss analytical mechanics.