Course evaluation: DN2266 Mathematical Models, Analysis and Simulation, part I, 2009/10

Course data

- DN2266 Mathematical Models, Analysis and Simulation, part I, 7.5 credits
- P1, P2 2009/10
- Personal: Michael Hanke, Jesper Oppelstrup, Jelena Popovic, Jon Häggblad
- Teaching sessions
  - Lectures: 48 timmar
  - Laborations: 6 timmar
- Students: 24 (including 4 PhD students)
- ECTS: Laboration 3.75, written examination 3.75.
- Prestationsgrad: 71% (per 2010-06-08)
- Examinationsgrad: 66% (per 2010-06-08)

Aims The goals of the course are to expose the students to and give them experience of important parts of applied and numerical mathematics, give the students experience of numerical experiments using MATLAB so that they will be able to analyze equilibrium models and dynamical systems with a finite number of degrees of freedom both theoretically and computationally.

Changes compared to the last year There are many changes compared to the last year:

- The course book has been changed to a more modern one.
- The first part of the course has been completely reworked.
- New topics have been included: network analysis, differential-algebraic equations, framework for modelling, spectral methods.
- Renovation and replacement of homeworks.
- The part on numerical methods has been extended to have equal weight with the analytical part.

Conclusions The following conclusions are based upon the answers to the course avaluation form, chats with the students, and experiences from the homework evaluation. They have been discussed with the teaching assistents.

General opinions

- The course was considered to be interesting and meaningful.
- The course was considered to be quite difficult. In the beginning, it was estimated rather easy while later parts (especially on numerical methods) were really hard to understand.

- Many students thought that their prerequisites for the course have been sufficient.

More detailed
- The most important problem was the number and amount of work required in the homeworks. Most students indicate that they spent more than half of their study time to this course - a time mainly spent in doing homeworks.
- Occasionally, there is the feeling that the course focuses too much on mathematics while leaving applications alone.
- Interestingly enough, the interest in the different topics is equally distributed.
- The new course book needs a better integration in the course. Its structure is very different from the old one.

Teaching In a usual fashion using lectures and lab work. Assignments: One assignment each week, from paper and pencil work to parameter studies of dynamical models in ecology and mechanics. Even partial differential equations were solved using Femlab.

Examination Written examination and computer labs

Kursliterature
- G. Strang: Computational Science and EngineeringApplied mathematics, Wellesley Cambridge 2007
- Lecture notes, copies of OH-slides

Prerequisites No problem.

Grading There wasn't any problem.

Planned changes
- Rework of the lecture material, add handout on DAEs (beside lecture notes)
- More focus on applications.