Linnæus University

# Course syllabus

Faculty Board of Science and Engineering
School of Computer Science, Physics and Mathematics

## 4FY824 Fluiddynamik, 7,5 högskolepoäng
## Fluid dynamics, 7.5 credits

**Main field of study**
Physics

**Subject Group**
Physics

**Level of classification**
Second Level

**Progression**
A1N

**Date of Ratification**
Approved by the Board of the School of Computer Science, Physics and Mathematics 2011-11-25

The course syllabus is valid from autumn semester 2012

**Prerequisites**
A bachelor degree in physics and/or mathematics and/or engineering with courses corresponding to 1FY804 Mechanics, 7.5 credits and 1MA165 multivariable analysis and vector analysis, 7.5 credits or equivalent.

## Objectives
Upon completion of the course, the student should be able to:

- formulate relevant matematical models of fluid mechanical phenomena
- apply the formulated models and give a physical interpretation of the result.

## Content
The course comprises:

- a derivation of the Navier-Stokes equations and a physical interpretation of their terms
- the transfer from compressible to incompressible equations
- calculation of the flow field for a number of analytical solutions
- stream function, velocity potential and Bernouillis equation

- the boundary layer approximation of the Navier-Stokes equations and similarity solutions
- linear wave theory with group and phase velocity applied on water waves
- separation
- a brief introduction to numerical methods for fluid dynamics

## Type of Instruction

Lectures and seminars. Group assignments and compulsory assignments may be given during the course.

## Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).
On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Assessment of student performance is made through written test and/or oral examinations and/or presentation of mandatory assignments. The assessment method is decided at the start of the course.

Students who do not pass the regular examination will be offered retrials close to the regular examination.

## Course Evaluation

A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

## Required Reading and Additional Study Material

Kundu & Cohen, Fluid Mechanics, Academic Press, 2008.