Fluid Mechanics

Programme course

6 credits

Fluidmekanik

TMMV18

Valid from: 2018 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined

Main field of study
Aeronautical Engineering, Energy and Environmental Engineering, Mechanical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Design and Product Development
- Energy-Environment-Management M Sc in Engineering
- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering
- Mechanical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, M Sc in Engineering
- Applied Physics and Electrical Engineering, M Sc in Engineering
- Mechanical Engineering, Master's Programme

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Thermodynamics

Intended learning outcomes
The course aims at creating a fundamental understanding of fluid mechanics. A comprehensive treatment of the fundamental equations is followed by application to different types of flows. In particular laminar and turbulent flow for internal and external flow situations, respectively. The course also includes an introduction to numerical methods as well as introduction to turbulence modelling.
After the course the student should be able to apply the governing equations on classical flow cases (eg Couette flow). The student should be able to solve a variety of flow cases using appropriate numerical methods as well as having a fundamental understanding about the properties of these governing equations

Course content

Historical perspective, fundamental equaions (continuity, Euler´s equations, Navier-Stokes´ equations, boundary layer equations, etc), laminar and turbulent flow, external and internal flows, compressible flow and non-stationary flow, introduction to numerical methods in fluid mechanics and an introduction to modelling of turbulence

Teaching and working methods

The course consists of lectures, tutorials, laboratory work and assignme

Examination

UPG3	Tasks to be examined in written and oral (seminar) form	2 credits	U, 3, 4, 5
UPG2	Assignments, written presentation	4 credits	U, 3, 4, 5

Contribution to the final grade: UPG2 70 % and UPG3 30 %. Both UPG2 and UPG3 must be approved to pass the courses.

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

Supplementary courses: Computational Fluid Dynamics and Computational Fluid Dynamics – advanced course

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Roland Gårdhagen

Examiner

Hossein Nadali Najafabadi

Course website and other links

http://www.iei.liu.se/mvs/utbildning/avancerade-kurser/

Education components

Preliminary scheduled hours: 92 h
Recommended self-study hours: 68 h

Course literature

Fastställs senare