SD2706 Sailing for Performance 6.0 credits

Segling för prestanda

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

The course syllabus is valid from Spring 2022 according to the school principal's decision: S-2022-0529 Decision date: 2022-02-24

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

The course is aimed at students in the first or second year at a Masters program in engineering. Bachelor of engineering with working knowledge in Matlab, mechanics, algebra and calculus is required.

English B / English 6

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After the course the student shall:

- know and be able to describe the fundamental concept of sailing
- be able to model the basic force/moment equilibriums of sailing
- be able to describe the various sources of resistance of a hull
- be able to describe the behavior of lifting foils
- be able to implement the mechanical model and solve the equilibrium equations of a sailboat in a velocity prediction program (VPP)
- be able to optimize the performance of a sailboat given a set of suitable constraints
- describe methods of deterministic weather routing, e.g. by dynamic programming
- know of state-of-the-art methods for VPP in yacht design

Course contents

The course addresses the mechanics of sailing in general applicable to all kinds of sailing vessels. The basic forces, moments and equilibriums are investigated to determine the performance of the vessel in various conditions. The course treats virtually all aspects of a the performance of a sailing vessel ranging from hydromechanics, aerodynamics, wave making resistance, modeling of equilibrium, definition of numerical solving of the non linear equations of equilibrium etc.

Course literature

Fossati, Fabio, Aero-Hydrodynamics and the Performance of Sailing Yachts, Adlard Coles Nautical, ISBN 978-1-4081-1338-7, 2009

Equipment

Base programme T, M, P, F or equivalent.

Examination

- RAPP - Report, 6.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

Final project with report and oral presentation.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.