



FSD3705 High-speed Craft Structural Design 6.0 credits

Dimensionering av snabba fartyg

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

Establishment

Course syllabus for FSD3705 valid from Autumn 2018

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

SD2411 Lightweight Structures and FEM or similar. Students taking (or having taken) the course SD2416 Structural Optimisation and Sandwich Design and students following the Naval Architecture Master of Science Program have priority.

Language of instruction

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

Intended learning outcomes

The learning objectives are that you after finishing the course should be able to:

1. describe the functions of and interaction between the different hull structural components in a high-speed craft structure,
2. describe the principal characteristics for different material concepts, such as sandwich, composite single skin and metals, and the differences in structural arrangement between different concepts,
3. describe the loads a high speed craft is subjected to,
4. describe background and principles for the semi-empirical methods for modelling of principal hydrodynamic characteristics for high-speed craft, and apply these methods to analyse running trim, running draught, drag, speed, and structural design loads,
5. apply basic structural mechanics such as beam and plate theory, to analyse high-speed craft structure components,
6. describe the purpose and principles of structure standard codes such as the classification society rules,
7. describe the different criteria which might rule the design of a high-speed craft structure,
8. make a preliminary structural design for a high-speed craft based on semi-empirical methods and classification rule requirements,
9. make complementary direct calculations on certain parts of a hull structure,
10. evaluate the efficiency of a structural design concerning for example ruling criteria, weight, building cost, maintenance cost, operational cost, and environmental influence.

Course contents

The course is problem based where you develop towards the learning objectives by working with design of the complete hull structure for a particular high-speed craft. All course participants work with the same craft but with different material concepts, e.g. sandwich, composite single skin, or metals. The design work is supported by a number of seminars, which treats the basic principles of lightweight structures in general and high speed craft hull structures in particular, modelling of the hydrodynamic performance for high-speed craft, design loads, design criteria, design methods and structural standard codes. The seminars are based on a number of articles and parts of the DNV High-Speed and Light Craft classification rules, and discussions around the progress of the structural design work. In the final seminar the different designs are presented, compared and evaluated.

Course literature

The course material is a number of technical articles, some parts of the DNV High-Speed and Light Craft classification rules.

Examination

- ÖVN1 - Exercises, 6.0 credits, grading scale: P, 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.

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

Examination is done through active participation in the seminars, including literature reviews and other preparation and deliveries and a final report.

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.