FSD3702 Advanced Topics in Naval Architecture 7.5 credits

Marinteknisk forskning

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

Establishment

Course syllabus is valid from Spring 2024 according to faculty board decision S-2024-0179. Date for decision 2024-06-10.

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

MSc in Vehicle and Maritime Engineering or equivalent.

Language of instruction

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

Intended learning outcomes

After completing the course, the student should be able to:

-Describe and communicate how the own research contributes to marine systems from a sustainability and socio-technical perspective.

-Understand important concepts and tools available for research in marine systems.

-Demonstrate a broad insight into relevant research areas other than one's own.

-Describe different aspects of how one's own research can contribute to nearby relevant research areas

-Develop an in-depth knowledge of the complexities of operating marine systems in realistic environments

Course contents

This course offers a flexible framework that is designed to broaden and deepen the knowledge of doctoral students in shipbuilding and marine technology. The course aims to primarily expand students' knowledge in hydrodynamics, hydroacoustics, fluid-structure interaction, marine biological questions, simulations, and electrical components in marine environments, or related/marine-related research.

Content varies depending on the PhD student's specialization and is tailored to their needs in consultation with relevant supervisors and examiners. The examiner ensures that the course content does not duplicate the research work.

The content is adapted to the specific research areas and focus of each student or group. Examples of focus areas include, but are not limited to:

Hydrodynamics: Principles of fluid mechanics applied in marine contexts, potentially encompassing a range from wave dynamics to flow simulation.

Hydroacoustics: Aspects of underwater acoustics and its applications in marine engineering, which may include studies on sound propagation and acoustic mapping.

Fluid-structure interaction: Interdisciplinary methods for studying the impact of fluids on marine structures, which can vary from stress analysis to safety assessments.

Marine biological questions: Exploration of marine ecology and environmental considerations relevant to shipbuilding, such as sustainable design and bio-inspired technology.

Simulations: Advanced simulation methods and their application in predicting and optimizing performance for marine structures and systems.

Electrical components in marine environments: Challenges and innovations within marine electrical systems, with possible emphasis on corrosion resistance, energy efficiency, or integration of new technologies.

The modules are developed in consultation with supervisors and the course examiner to ensure they are tailored to the dynamic needs of the field and the specific research questions posed by students. This enables a dynamic course plan that responds to current trends and developments in research on marine engineering, thereby ensuring that all studies are relevant and directly beneficial for students' PhD research and future careers.

Examination

- PRO1 - Project assignment, 7.5 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.

The course primarily consists of modules that students complete individually or in collaboration with other students, linked to current and relevant marine technology research. These modules typically comprise in-depth assignments, seminars, literature studies, peer review of research projects, and field studies. The modules gradually build a course portfolio that students present to the examiner during an oral examination.

Ongoing assessment takes the form of holistic evaluation of the student's portfolio, which includes written reporting, self-developed course materials, participation in seminars, and oral presentation of homework assignments, course evaluations, etc. Furthermore, a verbal presentation of the portfolio is followed by a discussion with the examiner.

Modules in the course are developed in consultation with instructors, students, and examiners. Modules can be updated or replaced during the course, following consultation between the examiner and instructor, if justified and in line with the course objectives. The scope of completed modules should clearly demonstrate equivalence to 7,5 ECTS credits in full-time studies.

Other requirements for final grade

To pass the course, a comprehensive course portfolio is required that clearly demonstrates how the student has achieved and worked with the course objectives. The scope of the portfolio's content should be clearly evident in relation to the size of the course. In addition, the student must have successfully completed a satisfactory oral examination and discussion with the examiner.

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.