SD261X Degree Project in Aerodynamics, Second Cycle 30.0 credits

Examensarbete inom aerodynamik, avancerad nivå

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 head of school at the SCI school has 2021-06-18 decided to establish this syllabus to apply from Spring 2022, registration number: S-2021-0755.

Grading scale

P, F

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

In order for special eligibility for a degree project course of 30 credits at the advanced level to be fulfilled all courses in grades 1-3, or courses required for issuance of bachelor's degree and at least 60 credits of advanced level courses must be completed.The courses on

advanced level must include courses in the program that are relevant to the degree project (can specified) as well as a course in theory of science and research methodology.

Specific eligibility requirements

Completed courses relevant to the degree project: Minumum two of courses SD2625 Computational Road Vehicle Aerodynamics, SD2611 Aerodynamic Design of Aircraft, SG2211 Vehicle Aerodynamics, SG2212 Computational Fluid Dynamics och SG2224 Applied Computational Fluid Dynamics.

Language of instruction

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

Intended learning outcomes

1. show knowledge of the disciplinary foundation of the chosen subject area and best practice, advanced understanding in current research and development and advanced method knowledge.
2. demonstrate the ability to search, collect and integrate knowledge critically and systematically with an overall view of the subject. Identify the need for additional knowledge.
3. demonstrate the ability to identify, analyse, assess and handle complex phenomena, issues and situations also with limited information
4. demonstrate the ability to plan and with adequate methods carry out qualified assignments within given time frames and to evaluate this work
5. demonstrate the ability to develop and evaluate products, processes, systems, methods or technical solutions with regards to human needs and the aims of the society for economically, socially and ecologically sustainable development
6. demonstrate the ability to orally and in writing in dialogue with different groups clearly explain and discuss the conclusions and the underlying arguments.
7. demonstrate the ability to make assessments considering relevant scientific, social and ethical aspects
8. show the skill required to participate in research and development projects, or to work independently in similar qualified activities

Course contents

The degree project consists of an individual assignment with a topic that is decided by examiner. It should normally constitute a specialisation within the chosen field of technology and be at the level of second-cycle studies. The degree project should correspond to 20 weeks of full-time studies. The work will be presented in a written report and an oral presentation at an open seminar.

Examination

• XUPP - Examination Question, 30.0 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.

Other requirements for final grade

The degree project is carried out individually or together with another student. In the latter case, the examiner should make sure that each student's effort corresponds to the requirements for an individual degree project. The degree project is presented orally and in writing in English.

The degree project will be assessed after the learning objectives above have been met. The grade is assigned by examiner as an overall assessment after the written report has been checked for plagiarism. The degree project must pass each of the requirements.

Students who have not completed the thesis within a year may fail the course. Such a decision is taken by the examiner after conultation with the programme co-ordinator.

Fulfillment of learning objectives:

Aim 1.

Pass: The literature study is thorough Current research and development relevant to the study is presented in a clear way. The method choice is well motivated, based on scientific or best practice and evaluated vis-Ã -vis other methods. Relevant knowledge from previous courses is adequately used.

Fail: The literature study is insufficient. Connections to current research and development is missing or is inadequate. The explanation of the chosen methods, or the evaluation of these methods is inadequate. The work shows on insufficient knowledge from previous courses.

Aim 2.

Pass: The work is done independently and systematically and based on critical analysis and synthesis of relevant literature. The work shows an overall perspective. Well chosen databases and search tools are used. The need of additional knowledge is discussed.

Fail: Relevant literature is to a great extent absent, or has not been integrated in the work. The literature is not examined critically. The work does not build on previous knowledge in the area. Discussions about possible further studies is missing.

Aim 3.

Pass: Relevant complex phenomena and topics are identified in the degree project. The work clearly shows that these are well handled and analysed even if available information is limited. Adequate assessment of the topic and results is carried out.

Fail: Relevant complex phenomena, issues and topics are not formulated, handled or analysed in the degree project. The work shows a deficient overall view of the topic or the topic

is unnecessarily limited to avoid the complexity of the assignment. Relevant assessments connected to the topic of the degree project are lacking.

Aim 4.

Pass: The project plan was followed. A thorough study is completed within the agreed time and with the methodology agreed upon. Possible changes in the plan or study have been approved by the supervisor. Resources and limitations in the study are clearly presented.

Fail: The work does not reach the level that was intended initially (or subesquently adjusted). Critical evaluation of the work is missing. The project plan regarding time and methodology has not been implemented.

Aim 5.

Pass: The chosen strategy is motivated and implemented so that developed and evaluated products, processes, methods, systems or technical solutions, are adapted to human needs and conditions. Consideration to relevant social aims is shown in such a way that the ability of future generations to meet their needs is not jeopardised.

Fail: Product, process, systems, method or technical solution have not been evaluated or developed in the degree project. Relevant analysis of manageablility and effects on our society, environment and economy is lacking.

Aim 6.

Pass: The report is well organized, linguistically sound and coherent. The discussion is well motivated. The citations are relevant and well integrated. Both the oral presentation as well as the communication during the work demonstrate the ability to present and discuss the work and the conclusions with different parties such as employers, supervisors, teachers, researchers and students.

Fail: The contents is not systematically presented, and the text or the oral presentation is difficult to understand. The argumentation in the discussion is deficient. The citations have an unclear aim, lie too close to the original source, or are piled without clear relationship. The written report is not linguistically sound or coherent. The continuous communication or the oral presentation do not show perceptiveness, clarity or ability to discuss the work and the conclusions.

Aim 7.

Pass: The degree project shows judgement, for example ability to to explain, motivate, criticise and recommend. Relevant topic-specific assessments based on scientific reasoning or previous experience are evident in the degree project. The degree project reflects on social and ethical aspects, unless this is shown to be irrelevant.

Fail: Judgement is lacking or inadequate. The work shows an inability to place the study in a larger context. The degree project does not consider ethical and social aspects even if these are relevant to the study, alternatively an explanation of why these aspects have not been discussed is absent.

Aim 8.

Pass: The student familiarizes him/herself with the topic at hand and demonstrate the ability to be a part of the working environment where the study was performed. The student

shows an ability to test, evaluate and also reject ideas and solutions in the discussions on the assignment. The student shows initiative and is open for supervision and criticism. The degree project is carried out largely independently.

Fail: Despite supervision and guidance the student does not show the ability or will to participate and be part of the working environment. The student does not come up with constructive ideas during discussions with supervisors and doe not show interest in advice and new proposals. The student does not demonstrate independent and creative work between the supervision sessions.

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.