SK202X Degree Project in Applied Physics, Second Cycle

General information

The master thesis project can be done at an institution or at a company either in Sweden or abroad and the course corresponds to about 5 months of full-time work. Registration to the course follows a special procedure as describe in detail below and can be done at any time during the academic year (i.e., from end of August to middle of June with exceptions for holidays).

You have the possibility to find your own project that fits your personal interests. Please carefully read all instructions in this course memo before you start to look for a project.

Preparations before course start

Before you can start with the course, you need to go through the following steps.

- Find a project
- Find an examiner
- Get registered for the course

Find a project:

When you look for a project, you have several alternatives. Below are some examples of useful sources where you can find suggestions for master thesis projects:

- Teachers and researchers at KTH (they also have a good contact network with people in companies or at other institutions)
- ARMADA (THS student union job fair)
- FUSION (THS physics chapter job fair)
- KTH Degree Project Portal (https://www.kth.se/en/samverkan/exjobb/studenter)
- Web pages of companies and academic institutions

Please be aware of the following before you start searching for a project.

- Swedish legislation requires that your written master thesis report is an open document that can be shared with anyone asking for it. However, other countries or companies may have a completely opposite legislation or tradition. If you plan to conduct a master thesis project abroad or at a company, you must always bring up and discuss this issue with your contact person already at your first meeting. An early discussion is necessary to avoid problems later on.
- Setting up a master thesis project can be time-consuming, and you should start your search early. Here is an indicative time list for when you should start looking:
    - Master thesis abroad: 6 months in advance
    - Master thesis at a Swedish company: 3 months in advance
    - Master thesis at a Swedish university: 1-2 months in advance

In case you are not able to find a project by yourself, you can always ask the course responsible for help (Director of undergraduate studies at the Department of Applied Physics, Ulrich Vogt, uvogt@kth.se).

Find an examiner:

If you have found a project in the Department of Applied Physics, your contact will suggest an examiner to you (often your contact will become your examiner). Your contact should also provide you with a supervisor that will take care of you during your project.
Please note: The supervisor can't be the examiner of your project at the same time.

If you have found a project elsewhere, in most cases your contact person can become the supervisor of your project. In this case you need to find an examiner at the Department of Applied Physics which is familiar with the topic of your thesis.

There are only certain faculty members at the Department of Applied Physics who have the formal right to examine the master thesis course SK202X. For a list of persons, please visit the course's webpage.

https://www.kth.se/student/kurser/kurs/SK202X?l=en

Get registered for the course:

Once you have found a project, you must arrange with the paperwork together with your examiner. The registration form can be downloaded from this page:

https://www.aphys.kth.se/internal/teaching

Please note that the starting date and the finishing date is a mutual agreement between you and your examiner/supervisor. When you agree upon these dates, you should try to make a reasonable estimate considering several factors as, e.g., courses you take in parallel with the project, vacations, supervisor's availability, access to experimental facilities, family reasons etc.

The registration form should be filled in and signed by you and your examiner. The registration form should then be sent electronically to the course responsible (uvogt@kth.se) for a final signature before the course is registered in LADOK.

You must formally be registered on the course in LADOK before you are allowed to start working on your project. This rule is motivated by insurance issues. Please also observe the special prerequisites as stated on the course webpage to be eligible for course registration.

During the course

It is strongly recommended (but not mandatory) that you write down a project plan for the master thesis project when it begins and get it approved by your supervisor/examiner. This

makes it much easier to follow up your progress during the project and to discuss adjustments to the plan if necessary.

Examination and completion

Your examiner is responsible to organize and perform the examination of your project. You are formally examined through a written report and an oral presentation. The following rules apply:

Written report

There is a general KTH design for the first and the last page of the written report – otherwise there are no special layout requirements. Information about layout rules for the cover page are found at

https://www.kth.se/en/student/studier/examensarbete/avhandlingarochexamensarbeten/skapa-ett-omslag-till-ditt-exjobb-1.479838

A TRITA number can be obtained from kursexp@physics.kth.se

Oral presentation

The master thesis work must be reported in an announced oral presentation in front of an audience, in the presence of the examiner. An invitation to the presentation should be sent by email to

- All people directly involved in the project
- The program director of the student's master program
- Other people at the Department of Applied Physics or elsewhere potentially interested in the work

Registration of results

The examiner is responsible for the registration of the results. For this, the result form must be filled out and send to kursexp@physics.kth.se, together with a pdf version of the report. The form can be found here:

https://www.aphys.kth.se/internal/teaching

The course expedition will then transfer the results into LADOK, where they must be approved by your examiner.

A master thesis project that has not been examined within one year from its start date, can be assigned the grade F. In such a case, the student needs to find another project. An examiner's decision about an F grade has always to be accompanied by a prior discussion with the director of studies at the department and can also involve viewpoints from the student, the supervisor, and the program director.

Grading criteria

The written report and the oral presentation will be assessed according to the following grading criteria, which are directly related to the learnings outcomes of the course.

Aim 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.

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-à -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. 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.

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. demonstrate the ability to identify, analyse, assess and handle complex phenomena, issues and situations also with limited information

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. demonstrate the ability to plan and with adequate methods carry out qualified assignments within given time frames and to evaluate this work

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. 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

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. demonstrate the ability to orally and in writing in dialogue with different groups clearly explain and discuss the conclusions and the underlying arguments.

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 and defence, 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. demonstrate the ability to make assessments considering relevant scientific, social and ethical aspects

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. show the skill required to participate in research and development projects, or to work independently in similar qualified activities

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.