

FYTK03, Theoretical Physics: Bachelor's Degree Project, 15 credits

Teoretisk Fysik: Examensarbete för kandidatexamen, 15 högskolepoäng
First Cycle / Grundnivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2022-06-08. The syllabus comes into effect 2022-06-08 and is valid from the spring semester 2023.

General information

The course is an elective course (the alternatives consist of FYSK03 and ASTK03) for first-cycle studies for a Bachelor of Science in physics.

Language of instruction: English

Supervision can be in Swedish if both the student and the supervisor agree on this.

Main field of study *Specialisation*

Physics	G2E, First cycle, has at least 60 credits in first-cycle course/s as entry requirements, contains degree project for Bachelor of Arts/Bachelor of Science
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Learning outcomes

The overall purpose of the course is that the student independently should conduct a scientific project within a well-defined sub-field of physics.

Knowledge and understanding

On completion of the course, the students shall be able to:

1. describe, use and explain physics that is included in the undergraduate education, including its disciplinary foundation,
2. use and apply the methods of physics,
3. give an overview of current research issues in a sub-field of physics,
4. describe and explain a specialisation within a sub-field of physics.

Competence and skills

On completion of the course, the students shall be able to:

5. search for, gather, evaluate and critically interpret the relevant information for a formulated problem in physics,
6. discuss phenomena and issues within physics,
7. independently formulate, appropriately define and solve problems in physics,
8. complete tasks within given time frames,
9. orally present and discuss information, problems and solutions within physics in dialogue with different audiences,
10. in writing present and discuss information, problems and solutions within physics in dialogue with different audiences,
11. work independently within the field of physics.

Judgement and approach

On completion of the course, the students shall be able to:

12. identify, discuss and make assessments considering relevant scientific, social and ethical aspects of physics,
13. identify and discuss the role of physics in society and the responsibility of the individual for how it is used,
14. identify, discuss and plan their own need for further knowledge,
15. identify different ways to develop their skills in physics or other fields.

Course content

In consultation with the supervisor and examiner, the student chooses an independent degree project corresponding to 15 credits. The project can be experimental or theoretical. The project can either be linked to current scientific projects at the department or to problems within the subject area at companies or other departments within or outside the university. If the project is carried out outside the department, there should also be a supervisor from the department. Proposals on degree projects are, for example, posted on the course website.

Course design

The degree project requires a survey of the literature and specialised studies. Furthermore, a number of compulsory course elements are included in the form of teaching sessions and seminars that cover, for example, scientific writing, academic writing, popular science writing, academic conduct and the use of library resources.

The project corresponds to ten weeks of qualified full-time studies. During the project, guidance is given by the supervisor with, on average, at least approximately one hour per week during the semester which the course is given. If the project is carried out outside the department, or the supervisor does not have the competence equal to a docent, then another supervisor, that fulfills this requirement, will be appointed at the department.

At the beginning of the course, the student and the supervisor have to register the degree project with the course coordinator. A plan that contains a definition of the project, an analysis of the problem and a time plan should be attached to the registration. The plan is written in cooperation between the student and the supervisor. The plan has to be approved by the course coordinator.

During the implementation of the degree project, at least one progress report is required, circa half way through the project, that is done together with the course coordinator and the supervisor at a halftime meeting. At the halftime meeting there is also a follow up of the original plan for the project and it is adjusted when needed.

The degree project is presented in the form of a thesis report in English or Swedish, with a popular description in Swedish or English. The degree project is also presented orally in English or Swedish, at a public seminar for discussion, criticism and analysis. Before the presentation, the student should review their work, together with their supervisor, based on the expected learning outcomes in this course syllabus.

Assessment

The examination and the compulsory course elements, which are required to pass the course, consists of the following (the learning outcomes that the different parts can examine are given within brackets):

- an approved plan that is established in the beginning of the project (outcome 1 and 7),
- participation in all compulsory course elements (prepare for outcome 9 and 10),
- progress report, that is demanded and approved by the course coordinator (outcome 3, 4, 7, 8, 10, 11, 14),
- a scientific, written thesis report about the project (outcome 1-8, 10-15),
- an oral presentation of the project, before an examination committee consisting of the examiner and at least one assessor who is an expert in the field. Supervisors have the right to attend and voice their opinion when the examination committee meets and decides the grade (outcome 1-9, 11-15),
- a popular science description of the project (outcome 10, 12-13).

The written report has to be submitted to the course coordinator, in a version that admits examination, at least two weeks before the seminar. If not, the oral presentation will be delayed with 5-7 weeks or as agreed by special agreement. Before the report is sent to the course coordinator, it has to be checked by the supervisor. The department is responsible for making copies of the report according to the requirements of the university and the faculty. After final approval, the student is responsible for archiving the report in the system supplied by the university.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Grades

Grading scale includes the grades: Fail, Pass, Pass with distinction

The final grade is determined by combining the results in the different parts of the examination. The examiner decides the grade in consultation with the examination committee. The supervisor has the right to attend and voice their opinion at the meetings of the examination committee. If the examiner assesses that the degree project can not be approved, the student should be given possibility to supplement the project for a renewed assessment within 5-7 weeks or by special agreement. According to the rules of the Faculty of Science, such a prolongation may lead to that only the grade Pass is possible, if the total time is prolonged with more than 20 %. If the degree project does not satisfy the learning outcomes for the course after this renewed assessment, the examiner can decide to fail it. This can imply that a new

project is required, in order to be able to fulfill all learning outcomes.

Grading criteria are to be available at the department at the start of the course.

Entry requirements

For admission to the course, 135 credits in science studies is required, out of which 90 credits in physics and 45 credits in mathematics according to the course requirements in the current program syllabus for a Bachelor of Science in Physics as well as English 6/B. Of the 90 credits in physics at least 15 credits has to be in theoretical physics.

Further information

The course replaces FYTK02 Theoretical Physics: Bachelor's Degree Project, 15 credits, and cannot be counted towards a degree together with that course.

The course is given by the Department of Astronomy and Theoretical Physics, Lund University.

See also the rules and recommendations for degree projects at the faculty of Science (Dnr N 2011/130).