

**Fundamentals of Theoretical Physics , 2.0 credits**

Fundamentala principer i teoretisk fysik, 2.0 hp

Third-cycle education course

6FIFMA1

Department of Physics, Chemistry and Biology

Valid from: Second half-year 2024

**Approved by**

**Approved**

**Registration number**

## Entry requirements

Entry requirement for studies on third-cycle education courses

- second-cycle degree,
- 240 credits in required courses, including at least 60 second-cycle credits,  
or
- acquisition of equivalent knowledge in some other manner

Specific entry requirements for this course:

Each of the four modules has its own prerequisite:

- The Quantum Mechanics module requires having passed a course in quantum mechanics at least comparable in level and content to the LiU undergraduate course TFFY54 Quantum Mechanics, 6 ECTS. (Having passed the IFM graduate course Quantum mechanics I, 7.5 ECTS ensures this level.)

- The Thermal Physics module requires having passed a course in thermal physics at least comparable in level and content to the LiU

undergraduate course TFTA12 Thermodynamics and Statistical Mechanics, 6 ECTS. (Having passed the IFM graduate course Statistical and Thermal Physics I, 7.5 ECTS ensures this level.)

- The Solid State Physics module requires having passed a course in

solid state physics at least comparable in level and content to the LiU undergraduate course TFYMO1 Solid State Physics I, 6 ECTS. (Having passed the IFM graduate course Solid State Physics I, 7.5 ECTS ensures this level.)

- The Electromagnetism module requires having passed a course in

electromagnetism at least comparable in level and content to the LiU

undergraduate course TFYB01 Advanced Electromagnetics, 6 ECTS.

These prerequisites are crucial for the course aims and are generally not subject to exemption.

## **Learning outcomes**

By the end of the course the students will be able to:

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obtained from prior courses to:

- read, analyze, examine, and evaluate scientific works both critically and constructively in a way that demonstrates a deep understanding of fundamental theoretical physics subjects.

## **Contents**

The course teaches the students to read, analyze, and scientifically discuss the content of a scientific work with the theoretical depth and command of fundamental theoretical physics subjects that should be expected by a graduate student in this field.

Each module assigns the student a scientific paper to read and prepare.

The student uses the knowledge obtained from the prerequisite courses in each subject to present the work and carry out an in-depth discussion of the work and related topics with the examiner.

## **Educational methods**

The course consists of self-study and examination.

## **Examination**

Two-grade scale for each module.

## **Grading**

Two-grade scale

## **Course literature**

Assigned at course start for each module.

### **General information**

The course is planned and carried out according to what is stated in this syllabus. Course evaluation, analysis and suggestions for improvement should be fed back to the Research and PhD studies Committee (FUN) by the course coordinator.