



Course syllabus

Faculty of Technology

Department of Physics and Electrical Engineering

4FY526 Klassisk elektrodynamik, 7,5 högskolepoäng

4FY526 Classical Electrodynamics, 7.5 credits

Main field of study

Physics

Subject Group

Physics

Level of classification

Second Level

Progression

A1N

Date of Ratification

Approved 2014-10-03

Revised 2017-01-12 by Faculty of Technology. Prerequisites are revised.

The course syllabus is valid from autumn semester 2017

Prerequisites

Physics 90 credits, mathematics 45 credits or equivalent.

Objectives

After completing the course the students should have acquired:

- a deeper understanding of classical electrodynamics, with emphasis on Maxwell's equations and electromagnetic waves.
- knowledge of mathematical methods of physics to solve partial differential equations commonly encountered in electrodynamics and other areas of theoretical physics.

Content

This course is an advanced course in classical electrodynamics.

1. Review of electrostatics, magnetostatics and induction.
2. Maxwell's equations, conservation laws and electromagnetic potentials.
3. Electromagnetic wave propagation in materials.
4. Simple radiating systems of moving charges.
5. Selected advanced topics, such as relativistic formulation, radiation by moving

charges, radiation damping, quantum optics.

Type of Instruction

The teaching consists of lectures and tutorials.

Students can also register for the “distance” version of the course and follow the course via the internet. IT support and technical information: Email and web connection. Real-time and recorded lectures will be available on the course learning platform.

Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.

The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student’s performance is assessed as fail (i.e. received the grade F).

Assessment of student performance is made through written test and/or oral examinations and/or presentation of mandatory assignments.

A second examination will be offered within six weeks under the regular semester periods.

The number of examinations is limited to five times.

Course Evaluation

A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Credit Overlap

The course cannot be included in a degree along with the following course/courses of which the content fully, or partly, corresponds to the content of this course: 4FY826 Classical Electrodynamics, 7.5 credits

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material

Reference Literature

J. D. Jackson, Classical Electrodynamics, 3rd Ed. 1998, J. Wiley & Sons. 808 pages

G. B. Arfken and H. J. Weber, Mathematical Methods for Physicists, 5th ed. New York: Academic Press, 2001.

Supplementary material provided by the Teacher