

Syllabus

for course at advanced level

Statistical Physics II

Statistisk fysik II

7.5 Higher Education

Credits

7.5 ECTS credits

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|--------------------------|---|
| Course code: | FK7016 |
| Valid from: | Autumn 2007 |
| Date of approval: | 2006-09-27 |
| Department | Department of Physics |
| Subject | Physics |
| Specialisation: | A1F - Second cycle, has second-cycle course/s as entry requirements |

Decision

Prerequisites and special admittance requirements

Statistical physics I (FK8008), 7.5 HECs. Also required is knowledge equivalent to Swedish upper secondary course English B.

Course structure

| Examination code | Name | Higher Education Credits |
|------------------|------------------------|--------------------------|
| 1100 | Statistical Physics II | 7.5 |

Course content

In this advanced course, you will learn about important concepts, methods and models in modern statistical mechanics. These are important for the understanding not only of condensed matter physics and the physics of elementary particles, but also of many phenomena in biology and even economy. An important focus for the course is how to characterize different phases and how to describe phase transitions. Concepts such as order parameter, spontaneous symmetry breaking, mean field theory, scaling and the renormalization group, are central, and they are illustrated by various applications on for instance magnetic systems.

Learning outcomes

After having passed the course the student is expected to:

- * understand and be able to describe simple models in statistical physics (Ising, XY, Heisenberg etc.) in combination with why and how they describe real physical systems
- * understand basic concepts like e.g. spontaneous symmetry breaking and average field theory and be able to use the mathematical formalism related to these
- * have knowledge regarding the numerical methods used in statistical physics and be able to apply these to simple physical systems

Education

The education consists of lectures, group education and hand-ins.

Forms of examination

- The student's knowledge will be tested by a written and/or oral exam.

b. Grading is carried out according to a 7-point scale related to learning objectives:

A = Excellent
B = Very Good
C = Good
D = Satisfactory
E = Sufficient
Fx = Fail
F = Fail

c. Grading criteria for the course will be distributed at the start of the course.

d. A minimum grade of E is required to pass the course.

e. Students who fail to achieve a pass grade in an ordinary examination have the right to take at least further four examinations, as long as the course is given. The term “examination” here is used to denote also other compulsory elements of the course. Students who have achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have failed to reach a pass grade on two occasions have the right to request that a different teacher be appointed to set the grade of the course. A request for such appointment must be sent to the departmental board.

Interim

Students may request that the examination is carried out in accordance with this syllabus even after it has ceased to apply. This right is limited, however, to a maximum of three occasions during a two-year-period after the end of giving the course. A request for such examination must be sent to the departmental board.

Limitations

The course may not be included as a part of a degree together with the course FY3920.

Misc

The course is given in a collaboration with KTH and is equivalent to their course 5A1390. The course may be a component of the master programmes in physics or studied as an individual course.

Required reading

Course literature is decided by the departmental board and is described in an appendix to the syllabus.