



## DEPARTMENT OF PHYSICS

### **FYP380 Symmetries in Physics, 7.5 credits**

Symmetrier i fysiken, 7,5 högskolepoäng

*First Cycle*

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#### **Confirmation**

This course syllabus was confirmed by Department of Physics on 2018-04-20 to be valid from 2018-04-20, spring semester of 2018.

*Field of education:* Science 100%

*Department:* Department of Physics

#### **Position in the educational system**

The course is an optional advanced course in the main subject physics and is included in the Physics program the third year. The course is also given as a freestanding course.

The course can be part of the following programme: 1) Bachelor of Science in Physics (N1FYS)

*Main field of studies*

Physics

*Specialization*

G2F, First Cycle, has at least 60 credits in first-cycle course/s as entry requirements

#### **Entry requirements**

For admission to the course, completed courses are required from the five first semesters in the Physics program, or that the equivalent knowledge has been acquired in a different way.

#### **Learning outcomes**

On successful completion of the course the student will:

*Knowledge and understanding*

- have an understanding how symmetries and symmetry analysis have influenced the theory development within physics
- have a good basis for further studies in group and representation theory

*Competence and skills*

- be able to use group and representation theory in connection to simple applications in quantum mechanics
- have ability to profit from physics literature containing simple symmetry arguments

**Course content**

The course includes the following:

- science-historical overview of symmetry concepts in physics,
- basic theory of critical phenomena (particularly scale invariance and universality),
- elementary renormalization group theory,
- introduction to group and representation theory with a focus on finite groups and theory of Lie groups and algebras,
- simple applications to quantum mechanical model systems.

**Form of teaching**

*Used forms of teaching:*

Lectures and problem solving classes.

*Language of instruction:* Swedish

null

**Assessment***Examination formats:*

The examination consists of written assignments as well as a written and orally presented project.

A student has the right to request a change of examiner if failed twice on the same exam, if this is practically possible. The application shall be sent to the board of the department and has to be in writing.

**Grades**

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

The grading scale includes the grades Fail (U), Pass (G), and Pass with distinction (VG).

Grade Pass: at least 50% of the total point on the written assignments as well as a well completed project.

Grade Pass with distinction: at least 75% of the total point on the written assignments as well as a particularly well completed project.

**Course evaluation**

At the end of the course an anonymous course evaluation is provided. The result is published on the course homepage in University of Gothenburg's learning management system (GUL).

**Additional information**

Further information about the course is found on the course homepage that is linked in GUL under course code FYP380.

There is an older version of the Course syllabus but this has not been put in to the "Gubas Kursplan" system.