

# Education plan

for

**Master's Programme in Computational Physics**  
**Masterprogram i beräkningsfysik**

**120.0 Higher Education  
Credits**  
**120.0 ECTS credits**

**Programme code:** NBEFO  
**Valid from:** Autumn 2007  
**Date of approval:** 2006-10-18  
**Department:** Department of Physics

## Decision

### Prerequisites and special admittance requirements

Degree of Bachelor of Science, including more than 90 credits in Physics. Also required is knowledge equivalent to Swedish upper secondary course English B or equivalent to one of the following tests; Cambridge CPE and CAE: Pass, IELTS: 6.0 (with no part of the test below 5.0), TOEFL (paper based): 550 (with minimum grade 4 on the written test part), TOEFL (computer based): 213, TOEFL (internet based): 79.

### Programme structure

The compulsory courses during the first year provide advanced knowledge about different computing methods including applications and limitations. This knowledge is then being implemented in the higher level courses and the examenwork. These courses provide possibility for specialisation in different direction in physics such as: quantum chemistry, fluid mechanics, biomathematics as well as a solid ground for later PhD studies. The knowledge acquired in these courses has applicability in different modern industrial applications

### Goals

For obtaining a masters degree in computational physics the student should be able to prove good and wide knowledge in computational Physics as well as deep understanding of different computational methods, ability of critical assessment and integrating knowledge in order to able to analyse processes and draw meaningful conclusion in situations where only a limited amount of information is available. The ability to communicate both oral and in writing to discuss and argue in front of different groups at national and international events is also a necessity.

Ability to participate in an independent manner in different research and development work, to take into consideration different relevant scientific, socio-political and ethical aspects and show understanding about the possibilities and limitations of science to provide answer to different questions as well as the role and answer of scientists in how these methods are being utilised and indentifying the need of new knowledge and take responsibility for a meanings full development of new knowledge.

### Courses

Compulsory courses: First and second Year:

First Year: Statistical Physics with applications AN,15credits\* ,Mathematical methods in Physics AN 7,5credits\*, Computational Physics AN 15credits\*, Electrodynamics 7,5 credits\*, Programming and datalogy for Physicists 7,credits\*, Numerical methods for Physicists 7,5credits\*

Second Year:

Examen work in Physics 45credits\*(in exceptional cases examen work corresponding to 30 or 60credits\* can be included).

Selected courses 15credits\* free choice from the courses included in the Program at 0-30credits\* level)

**Degree**

Master in computational Physics

**Misc**

Students who have been admitted to the program but have not finished the program during the two years period can ask for dispense to finish the program even after the program is ended. In this case limitations specified in the course plan are implemented. The Departments of Numerical Analysis and Datalogy at Stockholm University are being involved in the program giving compulsory as well as free choice courses. The courses can be given in English.