

Syllabus

for course at advanced level

Numerical Weather Forecast Models
Numeriska väderprognosmodeller

7.5 Higher Education
Credits
7.5 ECTS credits

Course code:	MO8006
Valid from:	Autumn 2016
Date of approval:	2016-10-03
Department	Department of Meteorology
Main field:	Meteorology
Specialisation:	A1F - Second cycle, has second-cycle course/s as entry requirements

Decision

This syllabus has been approved by the Board of Science at the Faculty of Science, Stockholm University, 2016-10-03.

Prerequisites and special admittance requirements

Knowledge corresponding to Geophysical Fluid Dynamics, 7.5 HECs (MO8009), Mesoscale Meteorology, 7.5 HECs (MO8005) and Numerical Methods in Meteorology and Oceanography, 7.5 HECs (MO8007). Also required is knowledge equivalent to English B.

Course structure

Examination code	Name	Higher Education Credits
8006	Numerical Weather Forecast Models	7.5

Course content

The course deals with numerical weather prediction models, their construction and application to forecasting and data assimilation. Computer based numerical exercises are an integral part of the course. The course includes:

- Numerical treatment of the model equations
- Computational grid
- Description of sub-gridscale processes
- Observational data included in data assimilation
- Assimilation techniques: optimal interpolation, 3 and 4 dimensional variational data assimilation, Kalman filtering
- Forecast quality sensitivity to different observation types, assimilation techniques and parameterisation techniques

Learning outcomes

After taking this course the student should be able to:

- Describe the principle construction of numerical weather prediction systems
- Describe the connections between theories of atmospheric dynamics and results from experiments with numerical weather prediction models

Education

The teaching consists of lectures, exercises, laborations and project work. Participation in laborations and the

associated group tutorials is compulsory. If there are special reasons, the Examiner may, after consulting the course teacher, allow the student to omit certain parts of the compulsory teaching.

Forms of examination

- a) Examination is done by written laboration reports as well as oral and written presentation of project work.
- b) Grading is done on a seven-step scale: A = Excellent B = Very good C = Good D = Satisfactory E = Sufficient Fx = Failed, some more work is required F = Failed, a lot more work is required. c) The grading criteria are handed out at the beginning of the course. d) For passing the course, at least grade E is required. e) Students that do not pass the regular test have the right to take further tests as long as the course is given. The number of tests is not limited. As "tests" are understood also other compulsory parts of the course. Students that have passed a test are not allowed to attempt another test in order to receive a higher grade. Students that have failed an examination twice, for a course or part of a course, have the right to request that another Examiner is appointed, unless special reasons speak against this. The request for this should be directed to the Board of the department. The course has at least two examination occasions per academic year the years teaching is given. Intermediate years at least one examination occasion is given.
- f) A student who receives grade Fx has the opportunity to do additional work in order to reach grade E. The Examiner decides what additional work is required and the criteria to pass. The additional work should be performed prior to the next examination occasion.

Interim

Students may request that the examination is performed according to this syllabus even after it has ceased to be valid. However, this may be done no more than three times during a two-year period after the course was last given. The request for this should be directed to the Board of the department.

Limitations

The course may not be included in a degree together with Large-scale circulation in the atmosphere and ocean, 10p (ME4270), Numerical Weather-Forecast Models, 7.5p (MO7010) or equivalent.

Misc

The course is a part of the Master's programme in Meteorology, Oceanography and Climate, but may also be taken as an individual course.

Required reading

The course literature is decided by the Board of the department and is published on the Department of Meteorology's website at least two months prior to course start.