

# Syllabus

for course at advanced level

**Geophysical Fluid Dynamics**  
**Geofysisk strömningslära**

**7.5 Higher Education  
Credits**  
**7.5 ECTS credits**

<b>Course code:</b>	MO8009
<b>Valid from:</b>	Autumn 2017
<b>Date of approval:</b>	2017-03-13
<b>Department</b>	Department of Meteorology
<b>Main field:</b>	Meteorology
<b>Specialisation:</b>	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, at Stockholm University 2017-03-13.

## Prerequisites and special admittance requirements

Knowledge corresponding to Atmospheric Physics and Chemistry, 30 HECs (MO4000) or Meteorology I, 15 HECs (MO8001) and Meteorology II, 7.5 HECs (MO8002). Also required is knowledge equivalent to English B/6.

## Course structure

Examination code	Name	Higher Education Credits
8009	Geophysical Fluid Mechanics	7.5

## Course content

This course covers central concepts and dynamical phenomena in meteorology and oceanography. It includes, e.g.:

- derivation and applicability of the shallow-water equations
- the Rossby number, fast and slow mode, reduction to quasigeostrophy
- geostrophic adjustment
- geophysical waves
- conservation laws for energy and momentum
- stability theory

## Learning outcomes

After taking this course the student is expected to be able to:

- explain central concepts and dynamical phenomena in meteorology and oceanography from basic equations of geophysical fluid dynamics
- carry out and present laboratory experiments with relevance to geophysical fluid dynamics

## Education

The teaching consists of lectures, calculation exercises and laborations. 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 a written test.
- 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, as well as passed written presentations of laborations and participation in all compulsory teaching.
- 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 demand 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 Meteorology, 20p (ME2030), Geophysical Fluid Dynamics, 7.5p (MO7006) 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 published on the Department of Meteorology's website at least two months prior to course start.