

# Syllabus

for course at advanced level

**Partial Differential Equations**  
**Partiella differentialekvationer**

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

<b>Course code:</b>	MM8008
<b>Valid from:</b>	Autumn 2019
<b>Date of approval:</b>	2006-09-27
<b>Changed:</b>	2006-09-27
<b>Department</b>	Department of Mathematics (incl. Math. Statistics)
<b>Main field:</b>	Mathematics/Applied Mathematics
<b>Specialisation:</b>	A1F - Second cycle, has second-cycle course/s as entry requirements

## Decision

This syllabus was approved by the Board of the Faculty of Science at Stockholm University on 27 September 2006. Technical revision by the Student Office 2019-04-25.

## Prerequisites and special admittance requirements

Admission to the course requires knowledge equivalent to 90 credits in mathematics, where Linear Analysis, 7.5 credits, The Foundations of Analysis, 7.5 credits, Analytic Functions I, 7.5 credits, and Ordinary Differential Equations, 7.5 credits, or equivalent, are included. English B/English 6 or equivalent.

## Course structure

Examination code	Name	Higher Education Credits
F808	Partial differential equations	7.5

## Course content

The course covers:

Introduction to first order equations. The wave equation: equation in one or several space coordinates, Huygens' principle. The Laplace equation: fundamental solutions, Green's function, Dirichlet problem, the maximum principle, Dirichlet's principle, introduction to Sobolev spaces. The heat equation: initial value problem, fundamental solutions, the maximum principle.

## Learning outcomes

After the course, students are expected to be able to:

\* account for and prove basic theorems on partial differential equations, especially the wave equation, the Laplace equation and the heat equation.

## Education

Instruction consists of lectures and exercises.

## Forms of examination

a. The course is examined as follows: Knowledge assessment takes the form of written and/or oral examination.

b. Grades are assigned according to a seven-point goal-related grading scale:

A = Excellent  
B = Very good  
C = Good  
D = Satisfactory  
E = Sufficient  
Fx = Fail (more work required before credit can be awarded)  
F = Total fail

c. The grading criteria will be distributed at the beginning of the course.

d. To be awarded a pass, the minimum grade E.

e. Students who fail an ordinary examination are entitled to take at least further four examinations, as long as the course is given. Examinations also include other obligatory elements of the course. Students who have passed an examination may not resit it in order to achieve a higher grade. Students who have failed on two occasions are entitled to request that a different teacher be appointed to set the grade of the course. Any such request must be made to the departmental board.

### **Interim**

Students may request that the examination be conducted in accordance with this course plan even after it has ceased to be valid. However, this may not take place more than three times over a two year period after course instruction has ended. Requests must be made to the departmental board.

### **Limitations**

The course may not be included in a degree together with the courses Partial Differential Equations (MA4210).

### **Misc**

The course is a component of the Master's Programmes in Mathematics and in Applied Mathematics, but it can also be taken as an individual course.

### **Required reading**

Course literature is decided by the departmental board and described thereafter in an appendix to the course plan.