



DEPARTMENT OF MATHEMATICAL SCIENCES

MMA430 Partial Differential Equations II, 7.5 credits

Partiella differentialekvationer II, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Mathematical Sciences on 2017-11-29 to be valid from 2018-01-01, spring semester of 2018.

Field of education: Science 100%

Department: Department of Mathematical Sciences

Position in the educational system

The course can be part of the following programmes: 1) Mathematical Sciences, Master's Programme (N2MAT) and 2) Bachelor's Programme in Mathematics (N1MAT)

Main field of studies

Mathematics

Specialization

A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

General entry requirements and the equivalent of the courses *MMG710 Fourier Analysis* och *MMG800 Partial Differential Equations*.

Learning outcomes

On successful completion of the course the student will be able to:

- formulate models in science and engineering that involve partial differential equations, including the correct boundary conditions and initial conditions,
- prove various types of existence, stability and regularity results for these problems,

- formulate finite element methods for these problems,
- explain the role of stability in the error analysis of such methods and be able to prove error estimates.

Course content

Existence and regularity of solutions of elliptic, parabolic and hyperbolic partial differential equations. The maximum principle. The finite element method. Error estimates. Applications to heat conduction, wave propagation, eigenvalue problems, convection-diffusion, and reaction-diffusion.

Form of teaching

Language of instruction: English

Assessment

The examination consists of a written exam at the end of the course. During the course, there may be optional assignments that give bonus points on the exam. Examples of such assignments are small written tests, labs, and oral or written presentations. Information about this is found on the course home page.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

Grades

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

Course evaluation

The course is evaluated with an anonymous questionnaire and/or a discussion with the student representatives. The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.

Additional information

For a list of course literature, see:

<https://www.chalmers.se/sv/institutioner/math/utbildning/grundutbildning-goteborgs-universitet/kurslitteratur/Sidor/Kurslitteratur-i-matematik.aspx>

The syllabus for MMA430 was originally established to take effect from 2007-07-01, when it replaced MAN665.