

Differential and integral calculus 3, MS-A0311, Spring term 2019

Webpage of the course

<https://mycourses.aalto.fi/course/view.php?id=22028>

Learning outcomes

After the course the student will be able to

- evaluate multiple integrals in cartesian, cylindrical and spherical coordinates,
- analyze the properties of vector fields,
- evaluate line and surface integrals of vector fields,
- calculate the gradient, divergence and curl, and knows what they represent,
- explain the idea of Gauss' and Stokes' theorems, and apply them in calculations.

Content

- change of variables in multiple integrals
- integration in cylindrical and spherical coordinates
- vector fields
- line and surface integrals
- gradient, divergence, curl
- Gauss's, Green's and Stokes' theorem

Course book

Calculus, A Complete Course, Adams and Essex, 8th edition (You can also use earlier editions of the book. However, the section numbering in earlier editions may be different from the 8th edition.)

Examination

There are two ways of getting a grade for the course.

- The first way is to participate in the exercise sessions, hand in solutions to problems for grading, and participate in the course exam (May 29th 16.30 - 19.30). Each week we have 2 exercise sessions. On the Tuesdays sessions the assistant will present solutions to problems on the board. For the Thursday sessions you will be given exercises ahead of time that you solve before the session and then present your solutions at the board. Each week you will also get 4 exercises that are handed in to the assistant for grading. The results from the course exam, the exercise sessions and the exercises that are handed in will be weighted together and give you a grade for the course. Your results on the course exam will give 60 % of the grade and the graded exercises 40 % of the grade.
- The other way is to write the exam May 29th 16.30 - 19.30 (or at a later date). The grade is determined by the result on the exam only.

Lecturer and assistants

My name is Björn Ivarsson and I am the lecturer for the course. My office is Y326 and you are welcome there with any question concerning the course that you might have. You can also e-mail me (bjorn.ivarsson@aalto.fi). The assistant is Julian Weigt and he will be running the exercise sessions.

Tentative plan for lectures

- Lectures 1 - 2 (Chapter 14 in the book)
- Lectures 3 - 4 (Ch 15.1 - 4)
- Lectures 5 - 6 (Ch 15. 5 - 6, Ch 16.1 - 2)
- Lectures 7 - 8 (Ch 16.3 - 4)
- Lectures 9 - 10 (Ch 16.5 - 6)
- Lectures 11 - 12 (Ch 16.7, Review)