Differential and integral calculus 3, MS-A0311, Period IV, Spring term 2022

Webpage of the course

https://mycourses.aalto.fi/course/view.php?id=32605

Information about the realisation of the course

All lectures and exercise sessions will be done as contact teaching. Pre-recorded lectures from last year will be available on MyCourses.

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, 10th edition (You can also use earlier editions of the book. However, the section numbering in earlier editions may be different from the 10th 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 (April 13th). Each week we have 2 exercise sessions. Group H01 meets on Wednesdays (not the first week) and Thursdays. Group H02 meets on Tuesdays (not the first week) and Fridays. For the first weekly group meetings (Tuesdays or Wednesdays) you will be given exercises ahead of time that you hand in solutions for before the meeting (deadline Mondays 23:59). The solutions are presented by the assistants. On the second weekly group meetings (Fridays) the assistant will present solutions to problems. Each week you will also get 4 exercises that are handed in to the assistants for grading (deadline Wednesday 23:59). The results from the course exam 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 50 % of the grade and the graded exercises 50 % of the grade.
- The other way is to write the exam April 13th (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. If you have any questions about the course you can e-mail me (bjorn.ivarsson@aalto.fi). The assistants are Cintia Pacchiano and Onni Salmi. They will be running the group meetings.

Tentative plan for lectures

- Lectures 1 - 2 (Chapter 15 in the book)
- Lectures 3 - 4 (Ch 16.1 - 4)
- Lectures 5 - 6 (Ch 16. 5 - 6, Ch 17.1 - 2)
- Lectures 7 - 8 (Ch 17.3 - 4)
- Lectures 9 - 10 (Ch 17.5 - 6)
- Lectures 11 - 12 (Ch 17.7, Review)