



GÖTEBORG UNIVERSITY

Faculty Board of Science

MMA410 Fourier and Wavelet Analysis

7.5 higher education credits

Second Cycle

This syllabus is the binding document.

1. Confirmation

The syllabus was confirmed by the Department of Mathematical Sciences on October 12, 2007 to be valid from October 12, 2007.

Field of education: Science. Responsible department: Mathematical Sciences.

2. Position in the educational system

The course Fourier and Wavelet Analysis, 7.5 higher education credits, is one of several single subject courses included in the two-year Masters Program in Mathematical Sciences. The course is also open for eligible students outside the program.

3. Entrance qualifications

The prerequisites for the course Fourier and Wavelet Analysis is the equivalent of 60 higher education credits in Mathematics, including the course MMG300 Multi Variable Analysis and some knowledge about Fourier methods.

4. Course content

The course deals with the Fourier transform and some related transforms, such as wavelet transforms, Hankel and Radon transforms, discrete transforms and fast evaluation of transforms. In particular issues concerning discretization (sampling, for example) and the application to signal and image processing are treated. Generalized functions (distributions) and other fundamental mathematical tools for Fourier analysis are also treated.

5. Learning outcomes

After completing the course, the student will be able to

- understand the relevant terminology, so as to be able to read reports and research papers on applied Fourier analysis
- give definitions of the different transforms treated in the course, and state the conditions

for their applicability

- apply Fourier transform methods in different areas of mathematics
- write simple computer implementations (e.g. for Matlab) of transforms, and use them for signal processing.

6. Required reading

List of required reading enclosed.

7. Assessment

An examination will be given at the end of the course. There is also a compulsory project.

A student who has failed a test twice has the right to change examiner, unless weighty arguments can be invoked. For this, the student must send a written request to the board of the department.

8. Grading scale

The grades are Fail (U), Pass (G), and High Pass (VG).

Students who are contractually entitled to ECTS grades should inform the examiner about this no later than one week after the start of the course.

Students without such entitlement will not be awarded ECTS grades. Grades will be converted into ECTS terminology according to a standard model approved by the University President.

9. Course evaluation

Oral and/or written course evaluation will be performed. The results of the evaluation will be communicated to the students and will serve as a guide for the development of the course.

10. Additional information

The language of instruction is English unless all involved are Swedish speakers.