



## Course syllabus

Faculty Board of Science and Engineering  
School of Computer Science, Physics and Mathematics

4MA114 Integralekvationer, 7,5 högskolepoäng  
Integral Equations, 7.5 credits

**Main field of study**

Mathematics

**Subject Group**

Mathematics

**Level of classification**

Second Level

**Progression**

A1N

**Date of Ratification**

Approved by Organisational Committee 2009-12-01

The course syllabus is valid from autumn semester 2010

**Prerequisites**

Linear Algebra, 7,5 hec (1MA151), Analysis of Several Variables, 7,5 hec (1MA152)  
Multivariable Calculus and Vector Calculus, 7,5 hec (1MA165), Functional analysis , 7,5  
hec (4MA115) or equivalent.

### Expected learning outcomes

Upon completion of the course, the student should be able to:

- apply functional analytic methods on operators and integral equations
- describe definitions and relations in the theory for integral equations and to use these in problem solving
- interpret, communicate and argue using mathematical notions.
- apply the studied theories within one area in applied mathematics, science and engineering.

### Content

The course comprises:

- bounded and compact operators
- Riesz theory
- Fredholm theory
- potential theory
- approximations of operators
- quadrature methods

- projection methods
- iterative methods.

### Type of Instruction

Lectures and seminars. Group assignments and compulsory assignments may be given during the course.

### Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

### Course Evaluation

After the course a written evaluation of the course will take place according to the University guidelines.

### Other

On request, a Swedish University course certificate will be awarded upon successful completion of the course.

Students who receive a passing grade in the course may download a course certificate through the Student Portal. Otherwise they may request a course certificate from the school secretary.

### Required Reading and Additional Study Material

#### **Required reading**

Rainer Kress *Linear Integral Equations*, 2nd edition, Springer, 1999. 265 pages.