Linnæus University

Dnr: 2014/2428 -3.1.2

Course syllabus

Faculty of Technology

Department of Mathematics

2MA105 Algebraiska strukturer I, 7,5 högskolepoäng
2MA105 Algebraic structures I, 7.5 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G2F

Date of Ratification
Approved 2009-12-01
Revised 2014-09-03 by Faculty of Technology. Objectives, content, examination and type of instructions are revised.
The course syllabus is valid from autumn semester 2015

Prerequisites
1MA162 Discrete Mathematics 7.5 credits and 1MA151 Linear algebra and Fourier series 7.5 credits or equivalent.

Objectives
The student should be able to:

- define elementary concepts in the theory of algebraic structures
- describe and derive fundamental properties of groups, rings, fields and Boolean algebras
- use methods of abstract algebra in areas of mathematical or applied nature.

Content
Group Theory:
Groups and Subgroups. Cyclic Groups. Permutation Groups. Lagrange's Theorem. Fermat's and Euler's Theorems. Homomorphisms and Isomorphisms between Groups. Cayley's Theorem. Normal Subgroups and Factor Groups. Burnside's Lemma.

Ring Theory:

Rings, Fields and Integral Domains. Homomorphisms and Isomorphisms between Rings. Ideals and Factor Rings. Polynomial Rings.

Boolean Algebras:
Partially Ordered Sets. Bounded, Distributive, and Complemented Lattices. Boolean Algebras.

Type of Instruction
Lectures and seminars.

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

The student's knowledge is assessed in the form of a written examination.

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
A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Required Reading and Additional Study Material

Svensson, P.-A. *Abstrakt algebra*, Studentlitteratur, 2001 or later. 229 (586) pages.

Prescribed litterature

- John B. Fraleigh, *A First Course in Abstract Algebra*, Addison Wesley, 2003 or later. 191 pages (520)
- *Distributed material*, Linnæus University, present year. 35 pages