Syllabus for Group and Ring Theory 7.5 ECTS credits

1. Course details
Approved by the Education Committee of the Faculty of Sciences 10-05-2007. The syllabus is valid from 01-07-2007. The course is at the Second cycle.

2. General information
The course is part of the main field of study in Mathematics at the Faculty of Science. The course is optional at the Second cycle in a Master’s degree in Mathematics. The course is also offered as a single subject course. The language of instruction is contingently English.

3. Learning outcomes
On completion of the course, the students shall:

- have developed the ability for mathematical communication orally and in writing,
- be familiar with basic concepts and methods in group and ring theory.
- have acquired basic knowledge for further studies in group and ring theory.

4. Course content
Groups: Permutation groups. Burnside’s lemma with application on Pólya arithmetic & Sylow’s theorems. Symmetric and alternating groups. The structure of finitely generated Abelian groups.

Rings: Noetherian and Artinian rings and modules. Artin-Wedderburn’s theorem. Finitely generated modules over a principal ideal ring with application in e.g. Jordan’s normal form.

Linear algebra: Multilinear mappings. Tensor product.

5. Teaching and assessment
Teaching consists of lectures and seminars. Compulsory hand-in exercises might be given during the course.

Examination takes the form of a written test and, in connection with this, an oral examination. Oral examination is held only for those who passed the appurtenant written test.

Students who fail the ordinary tests will have an opportunity to take another test in close proximity to the ordinary test.

6. Grades
Students are awarded one of the following grades: Distinction, Pass or Fail.

7. Admission requirements
To be eligible for the course requires: At least 67.5 ECTS credits in mathematics, therein the course MATM11 Algebraic Structures 7.5 ECTS credits,

8. Literature
According to a list established by the department, available at least five weeks before the start of the course. See the web-page for Mathematics NF.

9. Further information
The course cannot be credited as part of a degree along with MAT413 Group and Ring Theory, 5p.