MATH411-22S1 (C) 2022
Topics in Algebra

0.1250 EFTS
Semester 1 (S1) 2022

Prerequisites
MATH240 and MATH321 or their equivalent are strongly recommended. Enrolment is subject to approval by the Head of School.

Course coordinator and lecturer (Term 1)

Dr. Brendan Creutz

Room: Erskine 612
Email: brendan.creutz@canterbury.ac.nz
Office Hours: TBA

Lecturer (Term 2)

Prof. Felipe Voloch

Room: Jack Erskine Room 723
Email: felipe.voloch@canterbury.ac.nz
Office Hours: TBA

Welcome
Kia ora and welcome to the Department of Mathematics and Statistics. This course outline gives a brief overview of some of the things that you need to know during your time with us. To find out more, visit our website www.math.canterbury.ac.nz.

You can find out where and when lectures and examinations will be held, general information and syllabus and timetables, by using the following link www.canterbury.ac.nz/courses.

The webpage for this course is on Learn at http://learn.canterbury.ac.nz/MATH411. Please check this page regularly for all course information. News, course handouts, assignments, and assignment solutions can all be found there.

Course Description
The focus of this course is Galois theory, which provides a beautiful connection between field theory and group theory. It can be used to reduce certain problems about fields to group theory which is, in some sense, simpler and better understood. Topics in the theory of finite groups will be covered as needed. Goals of the course include proofs of the Abel-Ruffini Theorem (concerning insolubility of a general quintic equation by radicals) and the Fundamental Theorem of Algebra. Useful prerequisites are MATH240 or MATH321, and ideally both.

Learning Outcomes
At the end of the course, students will have
- familiarity with basic concepts from group theory and Galois theory;
- developed problem solving skills both as part of a team and as an individual;
- developed written and oral communication skills, emphasising the ability to explain what the mathematics means.

Text Books

The are course notes by J.S. Milne which may be helpful for parts of the course. They are available free online:

Group Theory http://www.jmilne.org/math/CourseNotes/gt.html

Fields and Galois Theory http://www.jmilne.org/math/CourseNotes/ft.html

Lecture notes for the course will also be available on Learn.

Assessment

Homework	45%
Final Examination	55%

Homework

Homework problems will be assigned at various times throughout the semester. These problems are designed not only to test your knowledge and prepare you for the exam, but also to further develop the material covered in the lectures. It is impossible to learn this subject without making a serious attempt at the problems assigned. You may work together on the assigned problems, but everyone must submit their own solutions. Your marks will depend both on correctness and clarity of your solutions.

Further details of the assessments will be provided via the Learn page in due course.