Algebra

MATH4301

Victor Scharaschkin
Brief description of course content


Lecturer

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Consultation hours: To be announced

Web page The course profile and course material can be found on the web at the following address: http://www.maths.uq.edu.au/~victors/4301/index.htm. This also contains up-to-date news about the course material and announcements for students. Please check this regularly during the semester.

Course goals

On completing this course students will:

- Understand the Galois correspondence between subgroups and extensions.
- Be able to calculate the Galois group of a polynomial of low degree defined over the rationals or a finite field.
- Understand how the theorem of modules over a PID generalizes several results from group theory.
- Have developed familiarity with the basic concepts of category theory.

Textbook and references

There is no set text.

ASSESSMENT

Required assessment tasks:

<table>
<thead>
<tr>
<th>Assignments</th>
<th>60%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam</td>
<td>40%</td>
</tr>
</tbody>
</table>
There will be 4 assignments, each worth 15%.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due Date</th>
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</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>Friday 12\textsuperscript{th} August at 3pm</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>Friday 2\textsuperscript{nd} September at 3pm</td>
</tr>
<tr>
<td>Assignment 3</td>
<td>Friday 23\textsuperscript{rd} September at 3pm</td>
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<tr>
<td>Assignment 4</td>
<td>Friday 28\textsuperscript{th} October at 3pm</td>
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To obtain the final grade, the marks will be weighted as described above and added to give a final mark out of 100. Students will receive a grade from 1 to 7 if their mark is above the following cut offs.

<table>
<thead>
<tr>
<th>Mark</th>
<th>85</th>
<th>75</th>
<th>65</th>
<th>50</th>
<th>45</th>
<th>20</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Assessment criteria

To earn a mark of 90%, a student must demonstrate an excellent understanding of the course material. This includes clear expression of nearly all their deductions and explanations, the use of appropriate and efficient mathematical techniques and accurate answers to nearly all questions and tasks with appropriate justification. They will be able to apply mathematical techniques to completely solve both theoretical and practical problems.

To earn a mark of 80%, a student must demonstrate a comprehensive understanding of the course material. This includes clear expression of most of their deductions and explanations, the general use of appropriate and efficient mathematical techniques and accurate answers to most questions and tasks with appropriate justification. They will be able to apply mathematical techniques to partially solve both theoretical and practical problems.

To earn a mark of 65%, a student must demonstrate an adequate understanding of the course material. This includes clear expression of some of their deductions and explanations, the use of appropriate and efficient mathematical techniques in some situations and accurate answers to some questions and tasks with appropriate justification. They will be able to apply mathematical techniques to solve fundamental problems.

To earn a mark of 50%, a student must demonstrate an understanding of the basic concepts in the course material. This includes occasionally expressing their deductions and explanations clearly, the occasional use of appropriate and efficient mathematical techniques and accurate answers to a few questions and tasks with appropriate justification. They will have demonstrated knowledge of techniques used to solve problems and applied this knowledge in some cases.

To earn a mark of 45%, a student must demonstrate some knowledge of the basic concepts in the course material. This includes occasional expression of their deductions and explanations, the use of a few appropriate and efficient mathematical techniques and attempts to answer a few questions and tasks accurately and with appropriate justification. They will have demonstrated knowledge of techniques used to solve problems.

To earn a mark of 20%, a student must demonstrate some knowledge of the basic concepts in the course material. This includes attempts at expressing their deductions and explanations and attempts to answer a few questions accurately.

A student will earn a mark of 1% if they show a poor knowledge of the basic concepts in the course material. This includes attempts at answering some questions but showing an extremely poor understanding of the key concepts.

Assessment policy

As solutions to assignments are distributed promptly, credit cannot be given for late assignments. Students who miss assignments through bereavement or ill health should document their problems and discuss this with the lecturer of the appropriate part of the course. They may be given an average mark for missed assignments.

Students who miss the mid semester exam through bereavement or ill health should document their problems and discuss this with a lecturer. A special mid semester examination may be
awarded. Allowance cannot be made for reasons such as sporting or social commitments, or overwork in other courses.

Students should be familiar with the assessment rules in their degrees as well as general university policy such as found in the General Award Rules. These are all set out on the Program and Course Information page on the UQ website http://www.uq.edu.au/student/courses/.
Plagiarism:

Below is the University’s definition of plagiarism

Plagiarism is the action or practice of taking and using as one’s own the thoughts or writings of another (without acknowledgement). The following practices constitute acts of plagiarism and are a major infringement of the University’s academic values:

(a) where paragraphs, sentences, a single sentence or significant part of a sentence which are copied directly, are not enclosed in quotation marks and appropriately footnoted;

(b) where direct quotations are not used, but are paraphrased or summarised, and the source of the material is not acknowledged either by footnoting or other simple reference within the text of the paper;

(c) where an idea which appears elsewhere in print, film or electronic medium is used or developed without reference being made to the author or the source of that idea.

When a student knowingly plagiarises someone’s work, there is intent to gain an advantage and this may constitute misconduct.

Students are encouraged to study together and to discuss ideas, but this should not result in students handing in the same or similar assessment work. Do not allow another student to copy your work. While students may discuss approaches to tackling a tutorial problem, care must be taken to submit individual and different answers to the problem. Submitting the same or largely similar answers to an assignment or tutorial problem may constitute misconduct.

For more information on the University policy on plagiarism, please refer to http://www.uq.edu.au/hupp/contents/view.asp?sl=3&s2=40&s3=12

Assignments containing plagiarised material may receive a score of 0.

Supplementary examinations

In some programs, a supplementary examination may be awarded in one course to students who obtain a grade of 2 or 3 in the final semester of their program and require this course to finish their degree. You should check the rules for your degree program for information on the possible award of supplementary examinations. Applications for supplementary examinations must be made to the Director of Studies in the Faculty.

Special examinations

If a student is unable to sit a scheduled examination for medical or other adverse reasons, she/he can and should apply for a special examination. Applications made on medical grounds should be accompanied by a medical certificate; those on other grounds must be supported by a personal declaration stating the facts on which the application relies.
Applications for special examinations for central and end-of-semester exams must be made through the Student Centre. Applications for special examinations in school exams are made to the course coordinator.

More information on the University’s assessment policy may be found http://www.uq.edu.au/hupp/contents/view.asp?s1=3&s2=30&s3=5

EPSA Faculty policy on the award of special and supplementary exams may be found at http://www.epsa.uq.edu.au/index.html?id=9329&pid=7564

Feedback on assessment:

You may request feedback on assessment in this course progressively throughout the semester from the course coordinator. Feedback on assessment may include discussion, written comments on work, model answers, lists of common mistakes and the like.

(http://www.uq.edu.au/hupp/contents/view.asp?s1=3&s2=30&s3=6)

Students may peruse examinations scripts and obtain feedback on performance in a final examination provided that the request is made within six months of the release of final course results. After a period of six months following the release of results, examination scripts may be destroyed.

Information on the University’s policy on access to feedback on assessment may be found at http://www.uq.edu.au/hupp/contents/view.asp?s1=3&s2=30&s3=5

EPSA Faculty policy on feedback and re-marking may be found at http://www.epsa.uq.edu.au/index.html?id=7674&pid=7564

Library contact:

The liaison librarian for Earth Sciences/Maths/Physics is located in the Physical Sciences and Engineering Library in the Hawken Building and may be consulted for assistance in the course:

Maths: Larah Seivl-Keevers
Email: l.seivl-keevers@library.uq.edu.au
Extension: 52367

Students with disabilities:

Any student with a disability who may require alternative academic arrangements in the course is encouraged to seek advice at the commencement of the semester from a Disability Adviser at Student Support Services.

Assistance for Students:

Students with English language difficulties should contact the course coordinator or tutors for the course. Students with English language difficulties who require development of their
English skills should contact the Institute for Continuing and TESOL Education on extension 56565.

The Learning Assistance Unit located in the Relaxation Block in Student Support Services. You may consult learning advisers in the unit to provide assistance with study skills, writing assignments and the like. Individual sessions are available. Student Support Services also offers workshops to assist students. For more information, phone 51704 or on the web http://www.sss.uq.edu.au/index.html.

**Student Liaison Officer:**

The School of Physical Sciences has a Student Liaison Officer as an independent source of advice to assist students with resolving academic difficulties. The Student Liaison officer will be Dr Peter Adams.

**Graduate Attributes:**

The following graduate attributes will be developed in the course:

**In-Depth Knowledge of the Field of Study**

- A comprehensive and well-founded knowledge of the field of study: through solving problems.
- An understanding of how other disciplines relate to the field of study: through applying the mathematical techniques of the course to simple problems from other disciplines.
- An international perspective on the field of study: through using internationally accepted standards of mathematical rigour and notation.

**Effective Communication**

- The ability to collect, analyse, and organise information and ideas, and to convey those ideas clearly and fluently, in both written and spoken forms: through tutorial participation and assignment presentation.
- The ability to interact effectively with others in order to work towards a common outcome: through cooperative learning strategies in practicals.
- The ability to select and use the appropriate level, style and means of communication: through assignments and practicals.
- The ability to engage effectively and appropriately with information and communication technologies.

**Independence and Creativity**

- The ability to work and learn independently.
- The ability to generate ideas and adapt innovatively.
- The ability to identify problems, create solutions, innovate and improve current practices.

**Critical Judgement**

- The ability to define and analyse problems
- The ability to apply critical reasoning to issues through independent thought and informed judgement
• The ability to evaluate opinions, make decisions and to reflect critically on the justifications for decisions.

Ethical And Social Understanding

• An appreciation of the philosophical and social contexts of a discipline

For more information on the University policy on development of graduate attributes in courses, refer to the web http://www.uq.edu.au/hupp/contents/view.asp?s1=3&s2=20&s3=5.