



MATH3907

Algebra IIIA

Session 1, Weekday attendance, North Ryde 2020

Department of Mathematics and Statistics

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General Information

Unit convenor and teaching staff

Unit Convenor/Lecturer

Ross Moore

ross.moore@mq.edu.au

12WW 734

please refer to iLearn

Lecturer

Frank Valckenborgh

frank.valckenborgh@mq.edu.au

12WW 613

please refer to iLearn

Frank Schoenig

frank.schoenig@mq.edu.au

Credit points

10

Prerequisites

130cp including (MATH2010 or MATH235)

Corequisites

MATH3900 or MATH3901 or MATH3905 or MATH300 or MATH331 or MATH335

Co-badged status

Unit description

This unit develops the basic ideas of modern abstract algebra by concentrating on the many facets of group theory. As well as the standard material leading to the isomorphism theorems, we cover combinatorial aspects such as presentations of groups, the Todd–Coxeter algorithm, and subgroups of free groups via groupoids. Also studied are permutation groups, finitely generated abelian groups, soluble groups and group representations. The unit is especially suitable for students majoring in the theoretical aspects of physics or computing science.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: exhibit profound understanding of the transformation groups of 3-dimensional objects, such as the highly symmetrical Platonic solids and related derived geometrical objects, by analysing their sub-groups and through explicit demonstration using hand-held models.

ULO2: construct all elements of the Group along with its multiplication table, given only a short-hand like Presentation of a Group, using generators and relators, by making skillful use of the Todd–Coxeter (non-deterministic) algorithm.

ULO3: demonstrate a well-developed knowledge of algebraic principles, concepts and calculation techniques as occur within Group Theory.

ULO4: apply relevant knowledge to structured, authentic problems in Group Theory and other fields in which Group Theory is used; through sustained logic, with clearly presented and justified mathematical arguments.

ULO5: present mathematical ideas, arguments and findings in a professional manner as appropriate to the intended audience.

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult [iLearn](#) for revised unit information.

[Find out more about the Coronavirus \(COVID-19\) and potential impacts on staff and students](#)

General Assessment Information

There is also a highly valuable, but not assessed, learning task that all students should complete either prior to commencement of lectures or within the first week and a half of the teaching session. This will provide students with hands-on models that will prove valuable during some of the early lectures. Consult the iLearn site for the details of this task.

ATTENDANCE and PARTICIPATION: Please contact the unit convenor as soon as possible if you have difficulty attending and participating in any classes. There may be alternatives available to make up the work. If there are circumstances that mean you will miss a class, you can apply for Special Consideration via [ask.mq.edu.au](#)

ASSIGNMENT SUBMISSION: Assignment submission will be online through the iLearn page.

Submit assignments online via the appropriate assignment link on the iLearn page. A personalised cover sheet is not required with online submissions. Read the submission statement carefully before accepting it as there are substantial penalties for making a false declaration.

- Assignment submission is via iLearn. You should upload this as a single scanned PDF file.
- Please note the quick guide on how to upload your assignments provided on the iLearn page.
- Please make sure that each page in your uploaded assignment corresponds to only one A4 page (do not upload an A3 page worth of content as an A4 page in landscape). If you are using an app like Clear Scanner, please make sure that the photos you are using are clear and shadow-free.
- It is your responsibility to make sure your assignment submission is legible.
- If there are technical obstructions to your submitting online, please email us to let us know.

You may submit as often as required prior to the due date/time. Please note that each submission will completely replace any previous submissions. It is in your interests to make frequent submissions of your partially completed work as insurance against technical or other problems near the submission deadline.

LATE SUBMISSION OF WORK: All assessment tasks must be submitted by the official due date and time. In the case of a late submission for a non-timed assessment (e.g. an assignment), if special consideration has NOT been granted, 20% of the earned mark will be deducted for each 24-hour period (or part thereof) that the submission is late for the first 2 days (including weekends and/or public holidays). For example, if an assignment is submitted 25 hours late, its mark will attract a penalty equal to 40% of the earned mark. After 2 days (including weekends and public holidays) a mark of 0% will be awarded. Timed assessment tasks (e.g. tests, examinations) do not fall under these rules.

FINAL EXAM POLICY: It is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is, the final day of the official examination period. The only excuse for not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these special circumstances, you may apply for special consideration via ask.mq.edu.au.

If you receive special consideration for the final exam, a supplementary exam will be scheduled in the interval between the regular exam period and the start of the next session. By making a special consideration application for the final exam you are declaring yourself available for a resit during this supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application.

You can check the supplementary exam information page on FSE101 in iLearn (bit.ly/FSESupp) for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Text: The recommended text for this course is Chris Cooper's "Groups, presentations and representations". This is available via iLearn as a collection of PDF files, one for each chapter. Each chapter corresponds to roughly 1 or 2 lectures (2 hours per lecture).

Other lecture slides and materials will also be made available at times appropriate for the lectures in which the material is discussed; either before-hand or afterwards.

Unit Schedule

Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult [iLearn](#) for latest details, and check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

WEEK	Beginning	Stream 1	Stream 2	Task Due
1	24 Feb	Introduction	Permutations	
2	2 Mar	Examples		Assignment 0
3	9 Mar	Theory, 1	The Todd-Coxeter algorithm	
4	16 Mar	Theory, 2		
5	23 Mar		Groups acting on sets: Sylow subgroups	Assignment 1
6	30 Mar	Representations	Semi-direct and wreath products	
7	6 Apr		— Good Friday holiday —	Project (first half)
MID SEMESTER BREAK				
8	28 Apr	Representations, (cont'd)	Free groups	
9	4 May			
10	11 May		Finitely generated abelian groups	Assignment 2

WEEK	Beginning	Stream 1	Stream 2	Task Due
11	18 May	Solvable groups		
12	25 May		Infinite abelian groups	Project (second half)
13	1 Jun	REVISION	REVISION	

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://stu>

dents.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.