MAST30005 Algebra

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus. Lectures and practice classes
Time Commitment:	Contact Hours: 3 x one hour lectures per week, 1 x one hour practice class per week Total Time Commitment: Estimated total time commitment of 120 hours
Prerequisites:	One of # **620-297 Group Theory and Linear Algebra (/view/2010/620-297)** # 620-222 Linear and Abstract Algebra (prior to 2009)
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Dr Lawrence Reeves
Contact:	Third Year Coordinator **Email: tycoord@ms.unimelb.edu.au (mailto:tycoord@ms.unimelb.edu.au)**
Subject Overview:	Algebra has a long history of important applications throughout mathematics, science and engineering, and is also studied for its intrinsic beauty. In this subject we study the algebraic laws satisfied by familiar objects such as integers, polynomials and matrices. This abstraction simplifies and unifies our understanding of these structures and enables us to apply our results to interesting new cases. Students will gain further experience with abstract algebraic concepts and methods. General structural results are proved and algorithms developed to determine the invariants they describe.
Objectives:	On completion of this subject, students should Have an understanding of: # rings, factorization in rings, principal ideal domains, Euclidean domains; # modules, free modules, structure theorem for finitely generated modules over a principal ideal domain; # fields, field extensions, finite fields, Galois extensions; splitting fields and the Galois correspondence. Be able to: # prove results about rings, modules and fields; # apply the Euclidean algorithm in a general context, including polynomials; # calculate the Jordan Normal form of a matrix; # describe the Galois correspondence for the splitting field of a polynomial.
Assessment:	Two or three written assignments due at regular intervals during semester amounting to a total of up to 50 pages (20%), and a 3-hour written examination in the examination period (80%).

Prescribed Texts:	None
Recommended Texts:	Michael Artin, Algebra, 1st Ed. Prentice Hall, New Jersey, 1991. B. Hartley and T.O. Hawkes, Rings, modules and linear algebra, 1st Ed. Chapman & Hall, London, 1970.
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2010/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2010/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2010/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2010/B-MUS)** You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	In addition to learning specific skills that will assist students in their future careers in science, they will have the opportunity to develop generic skills that will assist them in any future career path. These include: # problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies; # analytical skills: the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis; # collaborative skills: the ability to work in a team; # time-management skills: the ability to meet regular deadlines while balancing competing commitments.
Notes:	This subject is available for science credit to students enrolled in the BSc (both pre-2008 and new degrees), BASc or a combined BSc course.
Related Course(s):	Bachelor of Science
Related Majors/Minors/ Specialisations:	Mathematics & Statistics Major Mathematics and Statistics (Pure Mathematics specialisation) Pure Mathematics