

620-636 Commutative Algebra

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus. On-campus
Time Commitment:	Contact Hours: 36 hours comprising 2 one-hour lectures per week and 1 one-hour practice class per week. Total Time Commitment: 3 contact hours plus 7 hours private study per week.
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	It is recommended that students have completed a third year subject in algebra (equivalent to 620-321 [2008] Algebra).
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 participation are encouraged to discuss this with the subject coordinator and the Disability Liaison Unit.
Coordinator:	Dr John Richard James Groves
Subject Overview:	Commutative algebra is the basis of modern algebraic geometry. It provides the rigorous foundation for the study of curves and surfaces and their generalisations. Students will study: basic properties of rings, basic properties of modules including Nakayama's Lemma; Hom and tensor; Localisation; Noetherian properties and the Hilbert Basis theorem; Associated primes and primary decomposition; Grobner bases; Integral extensions; extension of primes in integral extensions; the Hilbert Nullstellensatz; Extended applications taken from Algebraic Geometry and Algebraic Number Theory.
Objectives:	After completing this subject, students should gain: <ul style="list-style-type: none"> - a deeper understanding of the theory of rings and modules; - an understanding of the basic concepts of Commutative Algebra such as localisation, Noetherian, associated primes and integral extensions; - an understanding of how these basic concepts apply in an area of mathematics other than algebra; - an understanding of proof-producing skills in an algebraic context and to assist in refining the presentation of the consequent proofs; - the ability to pursue further studies in this and related areas.
Assessment:	Up to 60 pages of written assignments (75%: three assignments worth 25% each, due early, mid and late in semester), a 2 hour written examination (25%, in the examination period).
Prescribed Texts:	TBA
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Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	Upon completion of this subject, students should gain the following generic skills: <ul style="list-style-type: none"> - Problem-solving skills including the ability to engage with unfamiliar problems and identify relevant solution strategies - Analytical skills through the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis - Through interactions with other students, the ability to work in a team

	- Time management skills: the ability to meet regular deadlines while balancing competing commitments
Related Majors/Minors/ Specialisations:	R05 RM Master of Science - Mathematics and Statistics