610-682 Chemistry 4A

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.
Time Commitment:	Total Time Commitment: Not available
Prerequisites:	None
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. This subject requires all students to actively and safely participate in laboratory activities. 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:	Assoc Prof Craig Hutton
Subject Overview:	Students enrolling in this subject must choose two of the following five 12-lecture modules: **Advanced Organic Synthesis** This module will outline some of the major methods of organic synthesis including asymmetric aldol and related reactions, sigmatropic rearrangements and metal-catalysed transformations. Applications in the synthesis of important chiral molecules will be discussed. **Free Radicals in Synthesis** This module will outline the fundamental steps important to radical chain chemistry and show how these principles can be used in the total synthesis of important molecular frameworks. **Lasers in Chemistry** This module will discuss general principles of laser action, the properties of laser beams, some specific types of lasers, laser-based spectroscopic methods, laser photochemistry, ultrafast lasers, and lasers in mass spectrometry. **Advanced Materials and Materials Characterisation** This module will explore advanced materials such as porous materials, nanomaterials, and materials for clean energy. Common materials characterisation techniques, such as electron microscopy, powder X-ray diffraction, thermal analysis and gas sorption, will be studied. **Magnetism in Chemistry** This module will explore magnetochemistry in the context of isolated spins, discrete spin clusters and extended systems. Areas covered will include magnetic susceptibility, the mechanisms of magnetic exchange interactions, long range ordering in extended solids, spin crossover complexes and single-molecule magnets .
Objectives:	The objectives of this subject are to provide students with an increased knowledge and understanding of advanced chemical principles, with emphasis on: • asymmetric synthetic methods • properties and performance of materials

	• magnetochemistry and spin systems • laser photochemistry Such knowledge will facilitate insights into the structure and properties of matter and the nature of chemical transformations.
Assessment:	Two 1.5-hour end-of-semester examinations (worth 50% each).
Prescribed Texts:	None
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:	At the completion of this subject, students will gain skills in: • advanced problem-solving and critical thinking skills • an ability to evaluate the professional literature • an understanding of the changing knowledge base • a capacity to apply concepts developed in one area to a different context • the ability to use conceptual models to rationalize experimental observations.
Related Majors/Minors/ Specialisations:	R05 RC Master of Science - Chemistry