CHEM90017 Chemistry 5A

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 30 hours in total comprising 2 x 1 hour lectures per week and 6 x 1 hour tutorials per semester. Estimated total time commitment of 120 hours per semester. Total Time Commitment: Not available
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Modules taken as part of subjects 610-681 Advanced Spectroscopy or 610-682 Chemistry 4A cannot be taken as part of this subject
Core Participation Requirements:	For the purposes of considering requests for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements for this entry.The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Coordinator:	Assoc Prof Craig Hutton
Contact:	Telephone: 8344 2393 Email: chutton@unimelb.edu.au
Subject Overview:	Students enrolling in this subject must choose two of the following 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. Photochemistry and Electrochemistry in Synthesis This module will explore the application of photochemistry and electrochemistry in synthesis, focussing on reactive intermediates (e.g. radicals and ions) which are accessible only with difficulty using standard methods. Applications of these techniques in chemical synthesis will be presented. 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. Advanced Structural Elucidation This module explores the fundamentals of structure determination as applied to organic and biological molecules, focussing on methods such as NMR and mass spectrometry. The

	combination of background theory and range of examples will enhance students' ability to acquire and analyse experimental data. Chemical Applications of Synchrotron Radiation This module will discuss the principles, instrumentation and applications of synchrotron radiation, particularly in the X-ray region of the electromagnetic spectrum. Examples will be drawn from chemical and biochemical systems, and applications to advanced materials and processes. Electronic Structure and Spectra This module will explore the application of symmetry to the interpretation of various spectroscopic techniques (absorption, emission, vibronic structure, CD, MCD), in order to determine the structure of, for example, metal complexes.
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 # background spectroscopic theory # the use of instrumentation # analysis of experimental spectroscopic data Such knowledge will facilitate insights into the structure and properties of matter and the nature of chemical transformations.
Assessment:	Each module will be assessed by either;a 1.5 hour exam after completion of the module, ora 1.5 hour exam after completion of the module (80%) and an assignment (2000 words, 20%) due mid-semester, ora 1.5 hour exam after completion of the module (80%) and a 15 minute oral presentation mid-semester (20%).
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 should 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 Course(s):	Master of Science (Chemistry)