

CHEM90017 Chemical Synthesis & Characterisation 2

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, 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 two 1-hour lectures per week and six 1-hour tutorials per semester. Total Time Commitment: 170 hours.
Prerequisites:	Entry into the Master of Science (Chemistry) (../view/current/mc-sciche) . Other students with appropriate Chemistry background may be permitted to enrol with subject coordinator approval.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Modules taken as part of subjects CHEM90008 or CHEM90009 cannot be taken as part of this subject CHEM90017
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:	Email: chutton@unimelb.edu.au (mailto:chutton@unimelb.edu.au)
Subject Overview:	<p>This subject provides a series of specialised modules in different areas of chemistry. Students must choose two modules. A selection of the following 12-lecture modules will be available:</p> <p>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.</p> <p>Interfacial Chemistry and Sonochemistry This module will study the production of nanometre-size colloids of metals and polymers using ultrasound, and how surface-active solutes affect the yield of the particles produced. The use of sonochemistry to decompose organic pollutants will also be discussed.</p> <p>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.</p> <p>Automatic Chemical Analysis This course will outline advanced methods in the automation of chemical analysis based on the use of batch, robotic and flow analysers. There will be a particular emphasis on flow injection and sequential injection analysis, focussing on clinical, industrial and environmental applications.</p> <p>Atmospheric Chemistry The chemical composition of the Earth's atmosphere is influenced by both natural processes and human activities. This course will provide an introduction into the chemistry of the atmosphere and explore some important problems, such as acid rain, ozone depletion, photochemical smog, greenhouse gases and global warming.</p>

	<p>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.</p> <p>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.</p> <p>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.</p>
Learning Outcomes:	<p>The objectives of this subject are to provide students with an increased knowledge and understanding of advanced chemical principles, with emphasis on:</p> <ul style="list-style-type: none"> # asymmetric synthetic methods # advance analytical techniques # electro- and photo-chemical principles # laser photochemistry # background spectroscopic theory # the use of instrumentation # analysis of experimental spectroscopic data <p>Such knowledge will facilitate insights into the structure and properties of matter and the nature of chemical transformations.</p>
Assessment:	Each module will be assessed by either; a 1.5 hour exam after completion of the module, or a 1 hour exam after completion of the module (60%) and an assignment (up to 3000 words, 40%) due at the end of semester, or a 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:	<p>At the completion of this subject, students should gain skills in:</p> <ul style="list-style-type: none"> # 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):	<p>Master of Philosophy - Engineering Master of Science (Chemistry) Ph.D.- Engineering</p>