CHEM30016 Reactivity and Mechanism

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2011, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 3 x one hour lectures per week; 1 x one hour tutorial per week. Total 48 hours. Total Time Commitment: Estimated total time commitment of 120 hours
Prerequisites:	One of

Subject	Study Period Commencement:	Credit Points:
CHEM20021 Physical Chemistry 2	Year Long	12.50
CHEM20022 Organic Chemistry 2	Year Long	12.50
CHEM20023 Inorganic Chemistry 2	Year Long	12.50
CHEM20014 Organic and Physical Chemistry 2	Year Long	12.50
CHEM20025 Physical and Inorganic Chemistry 2	Year Long	12.50
CHEM20024 Organic and Inorganic Chemistry 2	Year Long	12.50

Or both of

Subject	Study Period Commencement:	Credit Points:
CHEM20018 Reactions and Synthesis	Semester 1	12.50
CHEM20020 Structure and Properties	Semester 2	12.50

Or

One of

610-210 Light, Matter & Chemical Change A (prior to 2009)
610-211 Light, Matter & Chemical Change B (prior to 2009)

Plus one of

610-220 Organic Chemistry (prior to 2009)
610-221 Organic & Bio-organic Chemistry (prior to 2009)

Plus one of

610-240 Inorganic and Bio-inorganic Chemistry A (prior to 2009)
610-241 Inorganic and Bio-inorganic Chemistry B (prior to 2009)

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students who have completed any one of the following cannot enrol in this subject for credit

Subject	Study Period Commencement:	Credit Points:
CHEM30001 Physical Chemistry IIIA	Semester 1	12.50
CHEM30002 Physical Chemistry IIIB	Year Long	12.50

	CHEM30004 Organic Chemistry IIIA — Year Long — 12.50 CHEM30005 Organic Chemistry IIIB — Year Long — 12.50 CHEM30009 Inorganic Chemistry IIIA — Year Long — 12.50 CHEM30010 Inorganic Chemistry IIIB — Year Long — 12.50
Core Participation Requirements:	For the purposes of considering applications for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005) and Students Experiencing Academic Disadvantage Policy, 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. Hhttp://www.services.unimelb.edu.au/disability/
Coordinator:	Assoc Prof Uta Wille
Contact:	Director of Third Year Studies **Email: third-year-director@chemistry.unimelb.edu.au (mailto:third-year-director@chemistry.unimelb.edu.au)**
Subject Overview:	The concepts of quantum chemistry, statistical mechanics, molecular interactions and reaction kinetics will lay the fundamentals for the discussion of chemical reactions involving various types of reactive intermediates. The application of molecular orbital theory will be used to understand the nature of pericyclic reactions and the concept of coordination in main group (including carbon) and transition metal elements. Characterisation of metal complexes using electronic spectroscopy. Discussion of synthetic aspects will cover methods for carbon-carbon bond formation and functional group transformations, as well as principles of catalysis involving transition metal complexes and their chemistry in synthetic and biological systems.
Objectives:	The subject builds on the skills base established in CHEM20020 Structure and Properties. Students will develop the conceptual framework needed to rationalise chemical reactivity in contexts ranging from isolated molecules, macromolecules to surface chemistry. Important spectroscopic methods that underpin emerging areas of research in fields as diverse as materials science and biotechnology are introduced. Upon completion, students will have obtained the chemical knowledge that enables them to successfully specialize in all different areas of chemical sciences.
Assessment:	Three to six short tests each of duration less than 1 hour conducted on-line during the semester using the learning management system (LMS) for a total of 20% and a three-hour end of semester exam (80%)
Prescribed Texts:	P Atkins and J De Paula, Atkins' Physical Chemistry, 8th Ed. Oxford University Press, 2006. J McMurry, Organic Chemistry, 6th Ed. Thomson Brooks/Cole, 2004.C E Housecroft and A G Sharpe, 3rd Ed. Inorganic Chemistry, Pearson Prentice-Hall, 2008.
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2011/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2011/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2011/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:	At the completion of this subject students should have developed the following generic skills:

	# the ability to comprehend complex concepts and effectively communicate this understanding to the scientific community and in a manner accessible to the wider community; # the ability to analyse and solve abstract technical problems; # the ability to connect and apply the learnt concepts to a broad range of scientific problems beyond the scope of this subject; # an awareness of advanced technologies; # the ability to think and reason logically; # the ability to think critically and independently.
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:	Chemical Biotechnology (specialisation of Biotechnology major) Chemical Physics (specialisation of Physics major) Chemistry (specialisation of Chemistry major) Medicinal Chemistry (specialisation of Chemistry major) Science credit subjects* for pre-2008 BSc, BASc and combined degree science courses