CHEM20018 Chemistry: Reactions and Synthesis

Credit Points:	12.5
Level:	2 (Undergraduate)
Dates & Locations:	2015, 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; up to 3 x one hour non-compulsory enrichment seminars within normal university hours during the semester. Total 51 hours. Total Time Commitment: Estimated total time commitment of 170 hours
Prerequisites:	One of

Subject	Study Period Commencement:	Credit Points:
CHEM10004 Chemistry 2	Summer Term, Semester 2	12.50
CHEM10006 Chemistry for Biomedicine	Semester 1	12.50

Corequisites:	None
Recommended Background Knowledge:	It is recommended that students who plan to major in Chemistry also enrol in two semesters of first year mathematics, for example MAST10005 Calculus 1, MAST10006 Calculus 2 and MAST10007 Linear Algebra.
Non Allowed Subjects:	Students who have completed one of the following subjects may not also gain credit for this subject:

Subject	Study Period Commencement:	Credit Points:
CHEM20014 Organic and Physical Chemistry 2	Not offered 2015	12.50
CHEM20021 Physical Chemistry 2	Not offered 2015	12.50
CHEM20022 Organic Chemistry 2	Not offered 2015	12.50
CHEM20023 Inorganic Chemistry 2	Not offered 2015	12.50
CHEM20024 Organic and Inorganic Chemistry 2	Not offered 2015	12.50
CHEM20025 Physical and Inorganic Chemistry 2	Not offered 2015	12.50

Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Coordinator:	Assoc Prof Colette Boskovic
Contact:	**c.boskovic@unimelb.edu.au (mailto:c.boskovic@unimelb.edu.au)**

Subject Overview:	This subject covers key concepts associated with the synthesis and design of organic and inorganic molecules, molecular architecture and the energy transformations associated with chemical and physical processes. Topics covered include synthesis of simple polyfunctional organic compounds, thermodynamically controlled reactions of s-, p- and d- block elements and thermodynamics. In the last three weeks of the subject students will be able to choose between lecture modules with a focus on theory of advanced materials or biological chemistry. These topics have applications in drug discovery, chemical industry, nanotechnology, and energy harnessing through conventional and alternative energy sources.
Learning Outcomes:	Upon completion of this subject students should: # have developed an understanding of molecular properties and energetics and be able to apply these concepts to the synthesis of organic and inorganic compounds; # know approaches to the synthesis and some reactions of simple polyfunctional organic compounds; # be able to distinguish between kinetically and thermodynamically controlled reactions and to apply these concepts to rationalise synthetic transformations; # understand basic thermodynamic concepts and the application of these approaches to real solutions, mixtures and phase equilibria; # have a knowledge of the main factors controlling the substitution and redox reactions of main group and transition metal elements.
Assessment:	5 short tests each of duration less than 90 minutes conducted on-line using the learning management system (LMS) for a total of 20%; the tests will run at the end of weeks 3, 5, 7, 9 and 12 and the mark for this component of the assessment will be based on the average of the four highest marks with each tests contributing equally to this component of the assessment. A three hour examination at the end of the semester will contribute 80% to the final grade.
Prescribed Texts:	J McMurry, Organic Chemistry, 8th Ed. Thomson Brooks/Cole, 2012. P Atkins and J De Paula, Atkins' Physical Chemistry, 9th Ed. Oxford University Press, 2010. P. Atkins, T. Overton, J. Rourke, M. Weller and F. Armstrong, Shriver and Atkins' Inorganic Chemistry 5th Ed, Oxford University Press, 2010
Recommended Texts:	None
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2015/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2015/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2015/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2015/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 Majors/Minors/ Specialisations:	B-ENG Chemical Engineering stream B-ENG Chemical and Biomolecular Engineering stream Chemistry Chemistry Environmental Science major Environments Discipline subjects Master of Engineering (Biochemical) Master of Engineering (Chemical with Business) Master of Engineering (Chemical) Medicinal Chemistry Medicinal Chemistry Science-credited subjects - new generation B-SCI and B-ENG. Selective subjects for B-BMED