# CHEM30016 Reactivity and Mechanism

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| **Credit Points:** | 12.50 |
| **Level:** | 3 (Undergraduate) |
| **Dates & Locations:** | This subject is not offered in 2014. |
| **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:** | Both of<br>**Subject** / **Study Period Commencement:** / **Credit Points:**<br>CHEM20018 Chemistry: Reactions and Synthesis / Semester 1 / 12.50<br>CHEM20020 Chemistry: Structure and Properties / Semester 2 / 12.50<br>Exchange students are required to contact the subject coordinator prior to enrolment. |
| **Corequisites:** | None |
| **Recommended Background Knowledge:** | None |
| **Non Allowed Subjects:** | None |
| **Core Participation Requirements:** | For the purposes of considering request 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 of 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 website: |
| **Contact:** | Director of Third Year Studies<br>**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. An investigation of inorganic reaction mechanisms will focus on transformations involving coordination and organometallic complexes of d-block metals. 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. |
| **Learning Outcomes:** | 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 equally weighted short tests each of duration less than 90 minutes 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%) |

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| **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 (or later editions) P. Atkins, T. Overton, J. Rourke, M. Weller and F. Armstrong, Shriver and Atkins' Inorganic Chemistry, Oxford University Press, 5th Ed., 2010. |
| **Breadth Options:** | This subject potentially can be taken as a breadth subject component for the following courses:<br># **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2014/B-COM)**<br># **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2014/B-ENVS)**<br># **Bachelor of Music (https://handbook.unimelb.edu.au/view/2014/B-MUS)**<br>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:<br># the ability to comprehend complex concepts and effectively communicate this understanding to the scientific community and in a manner accessible to the wider community;<br># the ability to analyse and solve abstract technical problems;<br># the ability to connect and apply the learnt concepts to a broad range of scientific problems beyond the scope of this subject;<br># an awareness of advanced technologies;<br># the ability to think and reason logically;<br># 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:** | Chemical Biotechnology (specialisation of Biotechnology major)<br>Chemical Physics (specialisation of Physics major)<br>Chemistry<br>Chemistry<br>Chemistry<br>Chemistry (specialisation of Chemistry major)<br>Medicinal Chemistry<br>Medicinal Chemistry<br>Medicinal Chemistry (specialisation of Chemistry major)<br>Science credit subjects* for pre-2008 BSc, BASc and combined degree science courses<br>Science-credited subjects - new generation B-SCI and B-ENG.<br>Selective subjects for B-BMED |