610-280 Environmental Chemistry

Credit Points:	12.50
Level:	2 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus. Lectures and tutorials
Time Commitment:	Contact Hours: 36 lectures and six tutorials Total Time Commitment: 120 hours total time commitment.
Prerequisites:	One of # *Chemistry 1* # 610-121 (prior to 2008) # 610-141 (prior to 2008) # 610-051(prior to 2008) Plus one of # *Chemistry 2* # 610-142 (prior to 2009) # 610-122 (prior to 2008) # 610-052 (prior to 2008)
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their participation are encouraged to discuss this with the subject coordinator and the Disability Liaison Unit.
Coordinator:	Assoc Prof Trevor Smith
Subject Overview:	The subject matter covers some or all of the following topics: emissions to the troposphere; behaviour of pollutants in the troposphere and stratosphere; ozone and SMOG chemistry; air pollution potential (chemistry and meteorology); airborne particulates; acid rain and the greenhouse effect; the ozone layer; the structure and chemistry of freshwater bodies; the chemistry of nutrients; dissolved oxygen, Henry's Law and oxygen demand; the environmental impact of selected examples of metals, organic priority pollutants, pesticides and herbicides; water quality and health; the chemistry of soils (formation, constituents and properties); sources and characteristics of soil contaminants; absorption and persistence of contaminants in soils; soil degradation, salinity and acid-sulphate soils; chemical assessment of contaminated soils; an introduction to energy resources (e.g. fossil fuels, nuclear and solar) and the impact of energy utilisation; Environmental monitoring (principles of chemical analysis; calibration methods; experimental errors; frequently used analytical methods, i.e. volumetric analysis, spectrophotometry, gas and liquid chromatography, and atomic absorption spectrometry). A key aspect will be the comprehensive investigation of a current environmental chemistry issue, which will be taught in a small-group, scenario-based learning mode.
Objectives:	On completion of this subject students should comprehend the relationship between chemistry and the environment: namely the sources, reactions, transport, effects and fates of chemical species in the water, soil and atmospheric environments; the consequences of changes in the chemical composition of the environment for humankind and other species; and the consequences of energy utilisation. Students should appreciate the need for the integration

	of a chemically centred study of the environment with other approaches to the treatment of environmental data, and have developed an appreciation of the role of environmental chemistry in a wider social context. Students should have developed skills in recognising chemically based environmental problems, an awareness of the possible effects of chemicals on the environment and a capacity to interpret environmental data and to apply diverse chemical principles in the explanation of environmental phenomena. Students should appreciate the need for high quality environmental analysis, the links between the misuse of chemicals and pollution events, and the importance of selecting and utilising appropriate analytical methods and techniques for their monitoring. Students should understand the principles of the key analytical methods used in environmental chemistry. Students will also develop skills in investigating contemporary environmental chemistry issues, a consideration of the wider context of these issues, generic skills in operating in small teams and an awareness of professional practice as a scientist.
Assessment:	Written assignments not exceeding 15 pages due during the semester (20%); a 3-hour written examination in the examination period (80%).
Prescribed 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/2009/D09)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2009/F04)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2009/A04)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2009/M05)** 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
Notes:	Students enrolled in the BSc (pre-2008 BSc), BASc or a combined BSc course will receive science credit for the completion of this subject.
Related Course(s):	Bachelor of Engineering (Environmental) and Bachelor of Arts Bachelor of Engineering (Environmental) and Bachelor of Commerce Bachelor of Engineering (Environmental) and Bachelor of Laws