CHEM20011 Environmental Chemistry

Credit Points:	12.5
Level:	2 (Undergraduate)
Dates & Locations:	2016, 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 for 8 weeks (weeks 1-8); 1 x one hour tutorial per week for 6 weeks (weeks 4-10); 1 x 3.5 hour practical class per week for 6 weeks. Total 51 hours. Total Time Commitment: Estimated total time commitment of 170 hours
Prerequisites:	**One of the following subjects:** * Note that for CHEM10003 a final mark of >= 80 is required, and a package of materials will be made available to provide additional preparation for CHEM20011.

Subject	Study Period Commencement:	Credit Points:
CHEM10004 Chemistry 2	Summer Term, Semester 2	12.50
CHEM10003 Chemistry 1	Semester 1, Semester 2	12.5
CHEM10006 Chemistry for Biomedicine	Semester 1	12.5
CHEM10009 Advanced Chemistry for BioSciences	Semester 1	12.5

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 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:	Prof Spas Kolev
Contact:	**s.kolev@unimelb.edu.au (mailto:s.kolev@unimelb.edu.au)**
Subject Overview:	The subject covers important aspects of the structure and chemistry of the hydrosphere, atmosphere and lithosphere (soil). The subject also examines sources, chemistry and impact of environmental pollution, energy resources (fossil fuels, nuclear and solar) and the impact of energy utilisation. Subject topics also include the principles and application of quantitative chemical analysis and environmental monitoring (calibration methods; experimental errors; volumetric analysis, spectrophotometry, gas and liquid chromatography, and atomic absorption spectrometry). A key aspect of this subject will be the comprehensive investigation of a current environmental chemistry issue, which will be covered in a small-group, scenario-based learning mode.

	The practical component of this subject will involve the application of titrimetric, optical (spectrophotometry, atomic absorption spectrometry) and chromatographic (gas chromatography, high performance liquid chromatography) analytical techniques to the determination of compounds of environmental interest.
Learning Outcomes:	On completion of this subject students should have developed: # skills in analysing chemically based environmental problems; # an awareness of the possible effects of chemicals on the environment; # a capacity to interpret environmental data and to apply diverse chemical principles in the explanation of environmental phenomena; # an appreciation of the need for high quality environmental chemical analysis and the importance of selecting and utilising appropriate analytical methods and techniques for their monitoring; # an understanding of the principles of the key analytical methods used in environmental chemistry; # skills in investigating contemporary environmental chemistry issues; # an ability to operate in small teams; # an awareness of professional scientific practice. Through the practical component of this subject students should have acquired laboratory skills in classical analytical methods and modern spectrometric and chromatographic techniques, which are widely employed in environmental monitoring and analysis.
Assessment:	A written assignment as part of the scenario based learning component of the subject not exceeding 10 pages due during the semester (20%); a 2-hour written examination in the examination period (40%); and an ongoing assessment of practical work in the form of short laboratory reports due during the semester (40%). Satisfactory completion of both the practical work and the 2-hour written examination is necessary to pass the subject.
Prescribed Texts:	None
Recommended Texts:	# D. A. Skoog, D. M. West, F. J. Holler and S. R. Crouch, Fundamentals of Analytical Chemistry 9E, 9th Ed., Brooks/Cole, 2014. # G. W. van Loon and S. J. Duffy, Environmental Chemistry. A Global Perspective, 2nd Ed, Oxford, 2005. # Environmental Analytical Chemistry, Eds. D.Perez-Bendito and S.Rubio, Elsevier, 1999. # C. Baird and M. Cann, Environmental Chemistry, 3rd Ed., Freeman, 2005.
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/2016/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2016/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2016/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2016/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:	This subject will provide students with opportunities to develop 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 use conceptual models to rationalise observations; # the ability to think and reason logically; Upon completion of this subject students should gain skills in # planning; # time-management; # critical thinking; # data evaluation and interpretation; # conducting literature searches using scientific databases; # report-writing; # oral presentation; (must show in assessment) # problem-solving # working collaboratively with other students.
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. The sequence CHEM10003 - CHEM10004 - CHEM20011 and CHEM30012 forms the "Environmental Chemistry" 50 point breadth pathway. It is recommended that students who plan to major in Chemistry in the BSc to also have completed the following: # Mathematics and Statistics - two semesters of first year mathematics, for example MAST10005 Calculus 1, MAST10006 Calculus 2 and/or MAST10007 Linear Algebra. # Physics - VCE Units 3/4 12 Physics or equivalent, for example PHYC10005 Physics 1: Fundamentals
Related Majors/Minors/ Specialisations:	Chemistry Chemistry Engineering Systems Environmental Engineering Systems major Environmental Science major Environments Discipline subjects Science-credited subjects - new generation B-SCI and B-ENG. Selective subjects for B-BMED