CHEM90006 Analytical & Environmental Chemistry

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2014, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus. Lectures, laboratory classes
Time Commitment:	Contact Hours: .18 lectures and 32 hours of practical (project) work. Total Time Commitment: Estimated total time commitment of 120 hours
Prerequisites:	One of: **Subject** / **Study Period Commencement:** / **Credit Points:** CHEM20011 Environmental Chemistry — Semester 1 — 12.50 CHEM90007 Environmental Chemistry — Semester 1 — 12.50 CHEM20019 Practical Chemistry 2 — Semester 2 — 12.50 # 610-260 Analysis in Chemical and Life Sciences (prior to 2009) # 610-282 Spectroscopic Methods of Analysis (prior to 2010)
Corequisites:	None.
Recommended Background Knowledge:	None.
Non Allowed Subjects:	**Subject** / **Study Period Commencement:** / **Credit Points:** CHEM30012 Analytical & Environmental Chemistry — Semester 2 — 12.50 # 610-360 Analytical and Environmental Chemistry (prior to 2011)
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. http://www.services.unimelb.edu.au/disability/
Contact:	Prof Spas Kolev Email: **s.kolev@unimelb.edu.au (mailto:s.kolev@unimelb.edu.au)**
Subject Overview:	The lecture component of this subject covers the main sources and types of environmental contaminants with a focus on water contaminants and their effect on water quality. Frequently used analytical techniques in environmental and industrial monitoring and analysis, not covered in the prerequisite or other second year level chemistry subjects, will be outlined in the context of achieving desirable environmental outcomes. These include: volumetric analysis; gravimetric analysis; optical techniques (inductively coupled plasma optical emission spectrometry); electroanalytical techniques such as potentiometry (ion-selective electrodes, potentiometric stripping analysis) and voltammetry (polarography, anodic stripping voltammetry); analytical separation techniques (ion chromatography, extraction); and automatic analytical techniques (flow injection analysis). The practical component of this subject involves the application of chromatographic (ion chromatography, gas chromatography and high performance liquid chromatography),

	electroanalytical (potentiometry, polarography and anodic stripping volatmmetry) and optical (atomic absorption spectrometry) analytical techniques to environmental samples.
Learning Outcomes:	Upon completion of the subject, students should have acquired an in-depth understanding of the origin, distribution and role of environmental contaminants, and be able to select suitable methods for monitoring them. Students will also learn to apply analytical and problem-solving skills to the consideration of treatment options for industrial effluents. From the practical component, students should acquire enhanced laboratory skills and competence in using modern laboratory techniques.
Assessment:	Ongoing assessment of practical work in the form of short laboratory reports due during the semester (50%); a 45-minute written test held mid-semester (10%); a 2-hour written examination in the examination period (40%). Satisfactory completion of both theory and practical work 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*, 8th Ed., Thomson, 2004. D.A.Skoog, F.J.Holler and T.A.Nieman, *Principles of Instrumental Analysis*, 5th Ed., Thomson,1998 *Environmental Analytical Chemistry*, Eds. D.Perez-Bendito and S.Rubio, Elsevier, 1999. G.W. van Loon and S.J.Duffy, *Environmental Chemistry. A Global Perspective*, 2nd Ed, Oxford, 2005.
Breadth Options:	This subject is not available as a breadth subject.
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.