ERTH30001 Hydrogeology and Environmental Geology

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	This subject is not offered in 2011. Lectures, practical classes and field excursion.
Time Commitment:	Contact Hours: 2 x one hour lectures per week over 12 teaching weeks, 1 x two-hour practical class per week over 10 teaching weeks, 3 day field excursion (exact dates of excursion to be announced after the start of semester) Total Time Commitment: Estimated total time commitment of 120 hours.
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	At least 25 credits in 2nd year Earth Sciences subjects (geology-focused) is recommended. Although you will only need to apply basic algebra concepts in this course, familiarity with basic calculus concepts (e.g. integration, differentiation) will be helpful for understanding some lecture content. At least one semester of university physics or chemistry is strongly recommended. Students should query the subject coordinator directly if uncertain whether their previous coursework and/or background knowledge is sufficient.
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 Unit website: Hhttp://www.services.unimelb.edu.au/disability/
Contact:	**Email: jmoreau@unimelb.edu.au (mailto:jmoreau@unimelb.edu.au)**
Subject Overview:	Groundwater constitutes less than one percent of the Earth's surface water, but roughly 98% of its drinkable water. In this subject, we will discuss qualitatively and quantitatively the fundamental physical and chemical processes governing groundwater flow and composition, including aquifer properties, regional geology and hydrology, water-rock interactions, and subsurface microbial activity. You will learn field and laboratory methods used to characterize aquifer properties and groundwater chemistry, including well pumping tests, chemical tracers, and major ion and isotope analyses. Strong focus will be placed on environmental water quality and remediation methods grounded in an understanding of (bio)geochemical processes that can control contaminant mobility. We will continuously return to the theme of water as a vital natural resource. A three-day field excursion will draw together concepts and applications.
Objectives:	The objectives of this subject are to present the basic principles of groundwater flow and chemistry in a clear and engaging way, to illustrate these principles through effective hands-on learning practices (including fieldwork), to challenge students to conceptualize and describe dynamic groundwater processes in a quantitative way, and to reinforce scientific and critical thinking skills. Upon completion of this subject, students should have a broad yet rigorous understanding of the physical and chemical processes influencing the distribution and quality of groundwater.
Assessment:	Eight equally-weighted practical exercises (weekly from weeks 2-12 excluding weeks before/after field excursion) designed to reinforce learning of lecture content (25%), a three-day field excursion with accompanying practical exercise (25%), and a two-hour written, comprehensive final examination (50%). The field excursion and final exam are both prescribed (hurdle) requirements for this course.
Prescribed Texts:	None

Recommended Texts:	Introduction to Hydrogeology, Johannes C Nonner, 2nd Ed. CRC Press (2010) ISBN: 978-0-415-87555-4
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/2011/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2011/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2011/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2011/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:	Students will have the opportunity to gain/practice the following generic skills: critical thinking, applying the scientific method, quantitative data analysis and interpretation, scientific writing and presentation. The success of each student at achieving and/or improving these skills depends partly upon that student's ability and willingness to manage his or her own time effectively throughout the semester.
Links to further information:	http://www.earthsci.unimelb.edu.au/hydro/
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. Previously known as 625-307 Hydrogeology and Environmental Management (prior to 2009) Costs: Field excursion fee TBA
Related Course(s):	Bachelor of Science
Related Majors/Minors/ Specialisations:	Environmental Science Environmental Science Geology Science credit subjects* for pre-2008 BSc, BASc and combined degree science courses