

ERTH30001 Hydrogeology

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	This subject is not offered in 2010. 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, 1 x two-day field excursion (8 hours per day) Total Time Commitment: In addition to course contact hours, students should undertake 2-4 hours of self-directed study per week (including homework on practical assignments, writing of the literature critique, and self-directed review of lecture notes). Estimated total time commitment of 120 hours
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	At least one semester each of University level maths and chemistry are strongly recommended. In addition, at least 25 credits in 2nd year Earth Sciences subjects (preferably geology-focused) or the equivalent are suggested. Students should seek approval from the course coordinator if uncertain whether previous coursework is appropriate.
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. This subject requires all students to actively and safely participate in practical classes and field excursions. Students who feel their disability may impact upon their participation are encouraged to discuss this with the subject coordinator and the Disability Liaison Unit.
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 freshwater. Ancient civilizations could rise or fall as reliable groundwater resources were developed or failed; and modern cities, farms and industries rely no less upon this resource. 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. We will discuss field and laboratory methods used to characterize aquifer properties and groundwater chemistry, including well pumping tests, chemical tracers, and major ion and isotope analyses. A two-day field excursion will draw together many of the above concepts and topics.
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:	Ten equally-weighted practical exercises (weekly from weeks 2-12 excluding week of excursion) designed to illustrate/expand upon lecture content (25%), one literature critique of 1000-3000 words length due near the end of semester (10%), a two-day field excursion with accompanying practical exercise (15%), and a two-hour written, comprehensive, open-notes final examination (50%). The field excursion and final exam are both prescribed (hurdle) requirements for this course.
Prescribed Texts:	A course reader comprised of annotated selected readings will be made available for purchase at the School of Earth Sciences two weeks prior to the beginning of the semester.

Recommended Texts:	<p>Physical Hydrogeology and Groundwater Fluid Dynamics</p> <ul style="list-style-type: none"> # Fetter, C.W., Applied Hydrogeology, Prentice-Hall. 2001 # Fitts, C.R. Groundwater Science, Academic Press. 2004 <p>Chemical Hydrogeology and Aqueous Biogeochemistry</p> <ul style="list-style-type: none"> # Drever, J.I. The Geochemistry of Natural Waters, Prentice-Hall 1997 # Chapelle, F.H. Ground-Water Microbiology and Geochemistry, Wiley. 2000
Breadth Options:	<p>This subject potentially can be taken as a breadth subject component for the following courses:</p> <ul style="list-style-type: none"> # Bachelor of Arts (https://handbook.unimelb.edu.au/view/2010/B-ARTS) # Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2010/B-COM) # Bachelor of Environments (https://handbook.unimelb.edu.au/view/2010/B-ENVS) # Bachelor of Music (https://handbook.unimelb.edu.au/view/2010/B-MUS) <p>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.</p>
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	<p>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.</p>
Links to further information:	http://www.earthsci.unimelb.edu.au/hydro/
Notes:	<p>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.</p> <p>Previously known as 625-307 Hydrogeology and Environmental Management (prior to 2009)</p> <p>Costs: Costs will be levied for fieldwork components. \$40 course reader, \$120 weekend field excursion (covers transportation and lodging)</p>
Related Course(s):	Bachelor of Science
Related Majors/Minors/Specialisations:	<p>Environmental Science Environmental Science Environmental Science Geology Geology</p>