# EVSC90018 Hydrogeology and the Environment

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| **Credit Points:** | 12.50 |
| **Level:** | 9 (Graduate/Postgraduate) |
| **Dates & Locations:** | 2010, Parkville<br>This subject commences in the following study period/s:<br>Semester 1, Parkville - Taught on campus. |
| **Time Commitment:** | Contact Hours: Sixty hours. Specific activities will depend upon selected modules, but will be either class-room based workshop and/or field-based short course intensive-style, with each module delivered over a single full-time week of study. Total Time Commitment: Not available |
| **Prerequisites:** | None |
| **Corequisites:** | None |
| **Recommended Background Knowledge:** | None |
| **Non Allowed Subjects:** | The basic hydrology model (HYG) is not available for students who have previously completed 625-307 Hydrogeology or its equivalent. |
| **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 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. |
| **Coordinator:** | Assoc Prof Kevin Walsh |
| **Contact:** | Email: **kevin.walsh@unimelb.edu.au (mailto:kevin.walsh@unimelb.edu.au)** |
| **Subject Overview:** | This subject comprises two short course intensive modules and addresses hydrogeology, landscape evolution and coastal geomorphology. Students may choose between fundamental and advanced hydrogeology modules. Topics covered in fundamental hydrogeology include the principles of hydrogeology, groundwater flow and chemistry, isotopes in groundwater systems, and salinisation. Advanced hydrogeology topics include recharge and discharge, methods for evaluating aquifer systems and a field trip. Landscape evolution topics include earthquakes and seismicity, mountain building, quantitative geomorphology and Plio-Quaternary dating methods as they pertain to understanding geological problems in both plate boundary and intraplate settings. Coastal geomorphology topics include the nature and origin of the coastal materials, geomorphic processes, environmental history, practical issues in coastal management such as hazard/risk assessment, steep coast dynamics, beach maintenance and nourishment, impact of marinas and other engineering structures, potential indications and implications of sea level rise, and the conservation of significant and sensitive geoscience sites. |
| **Objectives:** | This subject aims to:<br>• equip students with discipline-specific knowledge and expertise appropriate for post-graduate research in the field;<br>• equip students with discipline-specific knowledge and expertise enabling them to take their place as professional geologists in industry or government organisations.<br>Depending upon the specific modules selected, this subject will provide students with the confidence and competence to:<br>• understand the occurrence and movement of groundwater;<br>• identify processes operating in natural aqueous systems using natural chemical tracers;<br>• describe ways in which contamination can occur and be detected;<br>• apply the knowledge obtained in the course to new problems impacting on groundwater; |

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| | • determine the movement of groundwater using conventional and emerging technologies;<br>• evaluate groundwater flow, storage, recharge by applying appropriate tests;<br>• describe ways in which preferential flow paths impact on groundwater systems;<br>• apply the knowledge obtained in the subject to address problems of importance to the minerals industry (e.g., such as those involving tailings dams);<br>• explain key concepts of regolith characteristics and evolution;<br>• appreciate the biophysical processes that affect the regolith, e.g., weathering, erosion and transport;<br>• describe regolith materials, including mineralogy and geochemistry;<br>• explain element dispersion and/or concentration in the regolith;<br>• describe exploration methods using geochemistry and geophysics for mineralisation within and below the regolith;<br>• appreciate the different sampling and analytical methods for regolith, water and biota;<br>• acquire and interpret environmental data (e.g. in relation to groundwater) in the context of hazard/risk assessment. |
| **Assessment:** | This subject comprises two short-course intensive modules, each equally weighted towards the final grade. The specific assessment details will depend upon the modules selected and students are directed to the outlines for each short-course for further details. Assessment tasks will be completed within the duration of the module, or within two weeks of its conclusion. Tasks required are broadly based upon 4,000 words equivalent for the entire subject, with a one-hour examination or 15 minute oral examination or presentation equivalent to approximately 1,000 words. Thus, a short course module may require a two-hour examination, a one-hour examination and a 15 minute presentation or 1,000 word assignment, or field reports, maps and cross sections equivalent of 2,000 words. For example, in the case of one short course that may be selected for this subject, the assessment can be described as “Submission of selected practical problems totalling no more than 1,000 words and a one-hour examination on last day of course”. |
| **Prescribed Texts:** | None. |
| **Recommended Texts:** | Texts will vary depending upon choice of modules. |
| **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:** | All modules available to this subject seek to assist students in developing their ability to:<br>• exercise critical judgement;<br>• undertake rigorous and independent thinking;<br>• adopt a problem-solving approach to new and unfamiliar tasks.<br><br>Depending upon which modules are selected, students will have the opportunity to:<br>• develop high-level written report and/or oral presentation skills;<br>• interrogate, synthesise and interpret the published literature;<br>• work as part of a team. |
| **Related Course(s):** | Master of Science (Earth Sciences) |