



Module Descriptor Form

Civil and Environmental Engineering

CL935 - Hydrogeology

Module Code	CL935	Module Title	Hydrogeology				
Module Registrar	Burnside, Dr Neil M						
Other Staff Involved	Dr Yannick Kremer (Lecturer)						
Credit Weighting	10	Semester	1	Elective	Yes	Academic Level	5
Pre-requisites							
Required for							

Module Format and Delivery (hours):

Lectures	Tutorials	Assignments	Labs	Private Study	Total
9	18	55	0	18	100

Educational Aim

This module aims to:

This module aims to guide the student:

- To gain an understanding of Hydrogeology as a discipline,
- To discuss and explore the physical mechanisms of water movement in the subsurface,
- To apply their knowledge of hydrogeology to the sustainable management of groundwater resources,
- Undertake practical written and numerical exercises to demonstrate key principals of groundwater science.
- To explore hydrogeological issues based on case studies.

Syllabus

This module will teach the following:

The module will include the following:

Introduction to Hydrogeology and the Hydrological Cycle
 Hydrogeological Terms and Darcy's Law
 Integrated Water Resources Management
 Elements of Groundwater Flow and Contaminant Transport
 Case Studies of Applied Hydrogeology focussing on sustainability
 Groundwater Development Essentials

Learning Outcomes

On Completion of the module, the student is expected to be able to:

LO: 1	The student will be able to understand the movement of groundwater in the subsurface and how to conceptualise groundwater movement as a resource in the subsurface.
LO: 2	The student will be able to understand the role of hydrogeology within sustainable water resources management and is familiar with the principles of Integrated Water Resource Management (IWRM).
LO: 3	The student will have the ability to interpret hydrogeological parameters and evaluate groundwater resources
LO: 4	The student will be able to understand the history of hydrogeology as a discipline and it's role within society .

(UK SPEC suggests no more than 4 learning outcomes per module. Statements must be broad and be syllabus free and link in with the intended learning outcomes on the programme specifications.)

Assessment of Learning Outcomes - Criteria

Learning Outcome: 1

	Criteria
1	- Define groundwater and it's role in the water cycle.
2	- Explain and apply Darcy's law, both numerically (on paper and in a spreadsheet) and conceptually (using exercises on paper)
3	- Explain the Groundwater Flow equation and how it relates to Darcy's law
4	- Explain the factors affecting transport of pollutants in groundwater
5	- Perform basic calculations on pollutant transfer

Learning Outcome: 2

	Criteria
1	- Explain the principles of integrated water management.
2	- Discuss the challenges for sustainable management of groundwater resources.

Learning Outcome: 3

	Criteria
1	- Explain key hydrogeological parameters and perform basic calculations and conversions (e.g. permeability, hydraulic conductivity, hydraulic head, (effective) porosity, three phases of soil, storativity and specific storage, particle size distributions, transmissivity, density, flux, recharge, baseflow (index), contaminant concentration, retardation factor, distribution coefficient, isotope fractionation, well specific capacity).

Learning Outcome: 4

	Criteria
1	- Explain the history of hydrogeology as a discipline.
2	- Discuss the role of hydrogeology and hydrogeologists in society and in particular in relationship to sustainable management of groundwater resources.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

To Pass the module, students need to gain a summative mark of: 50%

Description	Semester	Start Week	Duration	Weight	Submission Week	Linked Criteria
Individual video presentation	1	2		45%	6	
Group assignment	1			45%	10	

Principles of Assessment Feedback

The class is assessed by a combination of two assignments (45% each), and weekly MyPlace quizzes (10%).

For assignment 1 students will create a short video presentation on a subject in hydrogeology. Detailed instructions will be provided during the class. Assignment will be marked within 3 weeks of submission. Assignment is worth 45% of the final grade.

For assignment 2 students will work in a group, analyzing a problem in Hydrogeology and presenting their findings.

Additional Information**Resit Procedure**

The module resit is an oral examination during the August resit diet. During this examination the student will be asked theory questions, as well as solve practical problems.

Recommended Reading

Hiscock, K. M., & Bense, V. F. (2014). Hydrogeology: principles and practice. John Wiley & Sons.

Module Timetable

Week	Semester 1	Semester 2
0		
1		
2		
3		
4		
5		
6	Submission 45%	
7		
8		
9		
10	In Person 45%	
11		
E		

Date of Last Modification

06-11-2025