Module Code	**CE7E06**
Module Name	**Water Resource Planning and Climate Change**
ECTS Weighting[1]	5 ECTS
Semester taught	Semester 2
Module Coordinator/s	Prof. David O'Connell (david.oconnell@tcd.ie) Lecturer(s): Dr. Paul Nolan
Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline	On successful completion of this module, students should be able to evaluate a range of water resources problems in different hydrological environments. Specifically, students will gain an understanding of: LO1. Combined use of surface and groundwater resources, including river augmentation schemes and artificial recharge. LO2. Water resource planning in large river basins, especially the Nile basin. LO3. Arid zone hydrology, with emphasis on the Middle East. LO4. Protecting groundwater from pollution. LO5. Climate dynamics, including human-induced global warming and the models used to make projections of future climate scenarios. LO6. Environmental impact assessment and the preparation of Environmental Impact Assessment Reports, with particular emphasis on water schemes. **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Attained To develop continuously - Attained To communicate effectively - Attained
Module Content	To introduce students to a range of current water resource planning issues, in both temperate and arid regions. Module content: • Conjunctive use of surface and groundwater • Managed aquifer recharge • Low river flow analysis and river augmentation • Bankside well schemes

[1] TEP Glossary

- River basin management, taking the Nile as an example
- Water resource planning in arid zones
- Groundwater protection strategies in UK and Ireland
- Climate change, energy balance, global warming, global and regional climate models

Environmental impact assessment

Teaching and Learning Methods

This module is taught by a combination of lectures and tutorials, along with one assignment, which is linked to one of the module topics. The completed assignment has to be submitted by the end of week 6 of the second semester. The projects are marked and returned to the students with constructive comments.

Assessment Details[2]
Please include the following:

- **Assessment Component**
- **Assessment description**
- **Learning Outcome(s) addressed**
- **% of total**
- **Assessment due date**

Assessment Component	Assessment Description	LO Addressed	% of total	Week due
Examination	Examination [3 hours]	LO1-6	80	-
Coursework	Assignment related topics from one of LO1-6	Annually dynamic LO1-6	20	6

Reassessment Requirements

Contact Hours and Indicative Student Workload[2]

Contact hours: 27 hours
Independent Study (preparation for course and review of materials): 40.5 hr
Independent Study (preparation for assessment, incl. completion of assessment): 32 hr

Recommended Reading List

A comprehensive reading list is provided at the beginning of the course. Texts cited include 'Hydrology in practice' by Shaw et al. (2011), 'The hydrology of the Nile' by Sutcliffe & Parks (1999), 'Hydrogeology: Principles and Practice' by Hiscock & Bense (2014), 'Water wells and

[2] TEP Guidelines on Workload and Assessment

	boreholes' by Misstear et al. (2017), 'Water sustainability: A global perspective' by Jones (2011) and 'Introduction to Environmental Impact Assessment' by Glasson et al (2012). In addition, the module includes many case study examples, with an extensive reading list of published papers.
Module Pre-requisite	No specific pre-requisite, but previous engineering hydrology module helpful.
Module Co-requisite	No co-requisite
Module Website	
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.	No
Module Approval Date	
Approved by	
Academic Start Year	January 2025
Academic Year of Date	2025