CE7E06: E6 – Water Resource Planning and Climate Change [5 credits]

Module Co-ordinator(s): Assoc. Prof. Bruce Misstear (bmisster@tcd.ie)

Lecturer(s): Dr. Paul Nolan

Module organisation
Department of Civil, Structural and Environmental Engineering

Module description, aims and contribution to programme
To introduce students to a range of current water resource planning issues, in both temperate and arid regions.

Learning outcomes
Students will gain an understanding of:
1. Combined use of surface and groundwater resources, including river augmentation schemes and artificial recharge.
2. Water resource planning in large river basins.
3. Arid zone hydrology, with emphasis on the Middle East.
4. Protecting groundwater from pollution.
5. Climate dynamics, including human-induced global warming and the models used to make projections of future climate scenarios.

Module content
- Conjunctive use of surface and groundwater
- Managed aquifer recharge
- Low river flow analysis and river augmentation
- Bankside well schemes
- 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 strategies
Lectures, tutorials, coursework. Timetable – 3 hours per week for one semester.

Assessment
Written examination at end of semester; coursework during semester.
Required textbook / reading material
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), ‘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.

Further information
School of Engineering weblink.