

CE7M04: M4 – Engineering Project [5 credits]

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Module organisation

Department of Civil, Structural and Environmental Engineering

Module description, aims and contribution to programme

This module will provide an introduction to students the key aspects of research in engineering, research methods & designs, spatial data collection and analysis, critical appraisal of scientific writing, ethical and legal perspectives.

This module aims to:

- Develop a critical outlook in students regarding research
- Support students in the development of their research project
- Expose students to the organisation, conduct & implementation of research in Universities & Institutes
- Enable students to utilise the available research resources and develop a supportive research environment

Learning outcomes

On successful completion of this module, students will be able to:

1. Critically appraise of existing research tools, methods and publications
2. Identify scope of future research
3. Summarise, communicate (in written and oral form) research within and outside their own field
4. Demonstrate understanding of GIS software and apply the same for spatial data analysis

Module content

Research Philosophies in Engineering, Research in Academia, Research scopes & problems, Characteristics of good research and choice of research topic.

Spatial Data collection, Data analysis, Software training (GIS), Report writing and Presentation.

Teaching strategies

Seminars given by lecturers/ other academics/ industrial experts

Group/Individual learning of use of GIS software

Systematic approach to literature reviews and critical appraisal of writing through peer review activities

(Lecture notes and presentation will all be available online in Blackboard)

Assessment

Assessment is through written coursework and reports.

- Attendance of lunchtime lectures is mandatory. Assessment is through submission of short report on lunchtime lectures [worth 30%].
- Assignment using GIS software tool [worth 40%].
- Literature review, peer review report and meta-analysis of dataset [worth 30%].

Methods

1. A critical assessment of lunch time lectures; a two-page report of approximately 600-700 words (on any six of the lectures will be assessed) **(30%)**
2. Assignment using GIS software tool **(40%)**
3. Literature review, peer review report and meta-analysis of dataset **(30%)**

Recommended textbook

Text book on GIS:

- An Introduction to Geographical Information Systems, Ian Heywood, Sarah Cornelius, Steve Carver, 4th edition, Prentice Hall. LEN copies in Lecky Library.

Literature Review/Systematic Review:

- Boland, A., Cherry, M.G., & Dickson, R. (2014). *Doing a systematic review: a student's guide*.
- Haddaway, N.R., Woodcock, P., Macura, B., & Collins, A. (2015). *Making literature reviews more reliable through application of lessons from systematic reviews*. *Conservation Biology*, 29(6):1596-605.

Further information

<https://www.tcd.ie/Engineering/>