**MODULE CODE AND MODULE NAME** [25 credits]

**CE5E1 : Civil Structural and Environmental Engineering Research Project**

**Lecturer(s):** Assistant Prof Bidisha Ghosh ([bghosh@tcd.ie](mailto:bghosh@tcd.ie))

**Module organisation**
This module runs throughout the academic year both in semester 1 and 2.

**Module description, aims and contribution to programme**
This module allows the students to complete an individual research project on a topic of contemporary engineering research interest.
The main objective of this module:
- To plan, execute and report on an individual engineering research project.

Research topics and project titles will be proposed by academic staff in the School of Engineering based on their ongoing research activity. Students may propose their own research topics if they can demonstrate adequate prior knowledge and experience of the field, and if they can identify an appropriate academic supervisor.
Students are required to choose a research topic in week 1, semester 1 and start working on their individual research project under the supervision of an assigned supervisor.

**Learning outcomes**
On successful completion of the research project and dissertation, students will be able to:

1. Contribute individually to the development of scientific/technological knowledge in one or more areas of Civil Engineering.
2. Identify, assess and synthesize existing literature and research findings on an unfamiliar problem;
3. Apply a range of standard and specialised research tools and techniques to provide innovative and appropriate solutions to engineering problems of significant complexity.
4. Develop and apply theoretical, scientific and mathematical principles to effectively solve the research problem
5. Design and conduct unsupervised experiments and to analyse and interpret data;
6. Apply and develop software to model engineering systems;
7. Discuss and critically evaluate the research findings and reflect on the strength and limitations of the research; Assess the implications of the project outcomes for engineering practice;
8. Write a research dissertation to professional and academic standards using appropriate graphics and references;

Present complex ideas and material to peers and respond effectively to questions and criticism.
Module content
All techniques and material necessary for completing an individual research project are expected to be covered in this module.

Teaching strategies
Each individual project will be supervised by an academic staff member in the School of Engineering and may be undertaken independently or in conjunction with a research group or in connection with industry or another university, where circumstances are appropriate. Whenever a project involves significant collaboration with an industrial or other external partner, an external co-supervisor may also be appointed.

The students must meet their individual supervisor(s) in week 1, semester 1 or as soon as they are assigned a project title. There are no formal timetabled hours associated with the project but students are expected to spend the time it takes to make reasonable progress and to keep in regular contact with their supervisors. It is recommended that students make a formal arrangement with their supervisors to meet on a regular basis.

Assessment
The dissertation will be assessed using the following modes:
Summative
- Interim Project Report: 5 % (Due in week 12, Semester 1)
- Final Project Presentation: 5 % (Due in week 12, Semester 2)
- Poster presentation: 5 % (Due in week 7, Semester 2)
- Final dissertation: 85% (Due in end of week 12, Semester 2)
Formative
- The students are required to update the supervisor(s) on their progress in week 1, Semester 2.
- Viva Voce examination after the submission of project dissertation will contribute to the assessment of dissertation.

The dissertation is examined independently by the project supervisor and a second examiner; with a third examiner and the external examiner providing moderation when required. The interim project report and presentations also contribute to the overall assessment.

The following are the brief guidelines, which will be considered in assessing the final project reports:
1. Presentation: The project should be well structured, written in clear technical language with diagrams, well referenced and annotated. (25%)
2. Scope of Research: This includes understanding of the research topic, existing research done in the field and identifying the scope of proposed research in the dissertation. Consideration will be given to the difficulty of the subject and the amount of study required outside the normal curriculum. (25%)
3. **Originality and research work:** This includes design and execution of experiments, development and/or application of software, development and application of numerical or analytical models or physical prototypes etc. (25 %)

4. **Innovation and Conclusions:** Conclusions should be clearly and concisely set out and read directly from the work contained in the project. Innovative solutions and contributions to the research field will be taken into consideration. (25 %)

Two copies of dissertation, prepared following the guidelines provided by college, are required to be submitted.
The A copy is read and marked by the project supervisor, while a second marker marks the B copy. The marks from both are reported independently to the coordinator. If these marks do not agree within limits set by the Faculty, a third examiner may be asked to assess the project independently.
The performance in viva voce examination will be taken into consideration while agreeing to an overall mark.

**Required textbook**
https://www.tcd.ie/Graduate_Studies/currentstudents/admin/thesisregs/index.php
http://student-learning.tcd.ie/postgraduate/topics/writing/thesis/

**Further information**
Please refer to Blackboard for any further details on this module. (mymodule.tcd.ie)