



# Module Descriptor Form

## Civil and Environmental Engineering

### CL519 - Group Design Project B

Module Code	CL519	Module Title	Group Design Project B				
Module Registrar	Tarantino, Prof Alessandro						
Other Staff Involved							
Credit Weighting	20	Semester	2	Elective	No	Academic Level	5
Pre-requisites							
Required for							

### Module Format and Delivery (hours):

Lectures	Tutorials	Assignments	Labs	Private Study	Total
0	10	120	0	70	200

### Educational Aim

*This module aims to:*

This module aims to develop ability at multi-disciplinary design, working in small groups, utilising knowledge of fundamental principles of engineering science and material science to create innovative solutions for low carbon energy resources and Net Zero. Teaching and learning is achieved by self-directed group work over-seen and facilitated by a series of group tutorials with staff.

The project takes in the full breadth of the civil engineering profession from concept to detailed design, from political drivers to financial viability, from environmental issues to technical risk. Students will develop comprehensive and innovative designs that involve structural engineering, geotechnical engineering and water engineering, risk management, environmental and financial planning.

## Syllabus

*This module will teach the following:*

### Background

- The strategic, political and financial context of the development of low carbon energy resources
- The available energy resources and technology to harvest the energy
- The current state of the industry, the opportunities and constraints

### The Scheme

- An outline engineering solution proposal, including project planning and carbon management
- Energy yield, costs and financial viability
- Consideration of key geotechnical, structural and construction aspects of the design solution
- Technical risks and mitigation measures
- Environmental impacts and mitigation measures, contribution to Net Zero
- A conceptual design of a low carbon energy facility

The project report will be assessed on understanding and competence in these areas as well as the team's ability to bring all of these aspects together into a coherent and well written report.

## Learning Outcomes

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

LO: 1	Apply their knowledge and understanding of mathematics, science and computer based methods to analyse and solve a substantial range of engineering problems
LO: 2	Evaluate and synthesize design concepts from a range of areas including some outside engineering and apply them creatively and effectively in engineering projects
LO: 3	Research new theories, concepts, models, methods and information in unfamiliar situations, working independently and as a team to plan, delegate and collaborate, to deliver a design project to schedule
LO: 4	Apply engineering techniques taking account of a range of commercial and industrial constraints and communicate the resulting design to the client in an appropriate level of technical detail

*(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	LO1 Apply their knowledge and understanding of mathematics, science and computer based methods to analyse and solve a substantial range of engineering problems.  C1 Apply mathematical models to devise appropriate structural or geotechnical designs C2 Apply scientific principles to evaluate environmental impacts of a project C3 Apply computer based models to solve design challenges

Learning Outcome: 2

	Criteria
1	LO2 Evaluate and synthesize design concepts from a range of areas including some outside engineering and apply them creatively and effectively in engineering projects. C1 Evaluate the political, economic and environmental factors affecting energy production in Scotland C2 Evaluate the applicability and potential of a range of renewable energy generation technologies C3 Identify opportunities for renewable energy development for particular technologies and a shortlist of potential sites

Learning Outcome: 3

	Criteria
1	LO3 Research new theories, concepts models, methods and information in unfamiliar situations, working independently and as a team to plan, delegate and collaborate, to deliver a design project to schedule. C1 Identify knowledge gaps and seek appropriate sources of information C2 Identify component tasks and delegate workloads between group members C3 Coordinate the combination of tasks and informally review the combined results to meet deadlines

Learning Outcome: 4

	Criteria
1	LO4 Apply engineering techniques taking account of a range of commercial and industrial constraints and communicate the resulting design to the client in an appropriate level of technical detail. C1 Estimate costs, timescales and revenue from a proposed design and evaluate the probability of variation due to key risk factors C2 Evaluate likely project risks and appropriate mitigation measures

**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
Project proposal	2	1		20%	3	
Design report	2	4		80%	11	

### **Principles of Assessment Feedback**

- The project activities are spread throughout the semester, with the maximum possible time allowed with the constraints of exam weeks, national holidays, University closures and marks deadlines
- Feedback to each group is given at each project meeting so that they have the opportunity to improve their work on an ongoing basis.
- The design proposals allow formal feedback to be given at this key point in the projects so that students can incorporate the advice given into their conceptual design report.
- The group projects encourage peer dialogue covering many issues and also, structured discussion with the teacher.
- Assessment covers a range of skills and abilities (researching, presenting, writing, designing, drawing, calculations and scale drawings) so that students who have strengths in some skills, but not others, can still do well in this class.

### **Additional Information**

#### **Resit Procedure**

Resubmission of coursework(s), either individually or by the whole group, prior to commencement of the August exam diet.

#### **Recommended Reading**

The project brief includes an extensive lists of references and key information and is available on MyPlace in the folder for CL519.

Module Timetable

Week	Semester 1	Semester 2
0		
1		
2		
3		Submission 20%
4		
5		
6		
7		
8		
9		
10		
11		Submission 80%
E		

Date of Last Modification

06-11-2025