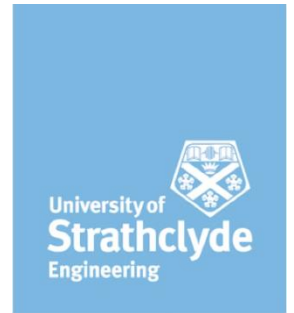


MODULE DESCRIPTION FORM



DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

CL518 CIVIL ENGINEERING DESIGN PROJECT A

Module Registrar: Dr Richard Lord	Taught To (Course): 5 th year MEng Civil Engineering 5 th year MEng Civil & Environmental Engineering		
Other Lecturers Involved: None	Credit Weighting: 20	Semester: 1	
Assumed Prerequisites: BEng 2/1 Hons in Civil Engineering or equivalent	Compulsory class	Academic Level: 5	Suitable for Exchange: N

Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
2	2	0	98			98			200

Educational Aim

The Group Design (“Energy”) Project

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. 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.

Learning Outcomes

On completion of the module the student is expected to be able to

LO1 Apply their knowledge and understanding of mathematics, science and computer based methods to analyse and solve a substantial range of engineering problems.

LO2 Evaluate and synthesize design concepts from a range of areas including some outside engineering and apply them creatively and effectively in engineering projects.

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.

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.

Syllabus

The module will **address** the following:

Background

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

The Scheme

- Outline engineering solution including project planning
- 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
- Outline (concept) design of an 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.

Assessment of Learning Outcomes

Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

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

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

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

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

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

Principles of Assessment and Feedback

(within Assessment and Feedback Policy at: <https://www.strath.ac.uk/staff/policies/academic/>)

Please state briefly how these are incorporated in this module.

- 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.
- Coursework assessment is broken down into the specific topics to be covered and the proportion of the overall marks allocated to each topic is specified.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

	Examinations				Courseworks		Projects	
	Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting
L/Outcomes					1	20	1	80
					1, 2, 3, 4		1, 2, 3, 4	

Indicate which learning outcomes (LO1, LO2 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines (*academic weeks*):

Weeks

- (1) Project proposal – formative assessment only for feedback, marked pass/fail, possible 0/20 % reduction of mark obtained for report, (week S1 4 (11))
- (2) Design report – summative assessment for module with additional feedback, report mark provides module mark, less any penalty from a failed proposal (week S1 13 (20)).

Resit Assessment Procedures:

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

PLEASE NOTE:

Students must gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of coursework. No marks from any previous attempts will be transferred to a new resit attempt.

Recommended Reading

***Purchase recommended **Highly recommended reading *For reference

**

The project brief includes an extensive lists of references and key information and is available on MyPlace in the folder for CL518.

Additional Student Feedback

(Please specify details of when additional feedback will be provided)

Date	Time	Room No
Weeks 5 or 6	During class	On Zoom

Session: 2021-2022

Approved:

Course Director Signature:

Date of Last Modifications: 30-8-21

ASSESSMENT TIMETABLE

Class Code	CL518	Class Title	CIVIL ENGINEERING DESIGN PROJECT A
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Indicate in the tables below the Hand-Out (H), Submission (S) and Feedback (F) week number for each assignment (lab report/coursework/project etc) and the timing of each Exam (E), Class Test (CT) or Quiz (Q)

Semester 1

Assessment type (& title)	LOs	Weight (%)	Individual / Group	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period	Christmas Vacation onwards
(1) Project proposal	1, 2, 3, 4	20	Group	H			S	F cohort 1	F cohort 2							
(2) Design report	1, 2, 3, 4	80	Group	H											S	F on MyPlace following marks submission

Appendix

Mapping Module Learning Outcomes to AHEP

Assessment Title	Engineering Council AHEP competencies
Design report & project proposal	<ul style="list-style-type: none"> • Ability to extract and evaluate pertinent data and to apply engineering analysis techniques in the solution of unfamiliar problems. • Investigate and define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards • Work with information that may be incomplete or uncertain, quantify the effect of this on the design and, where appropriate, use theory or experimental research to mitigate deficiencies
Design report & project proposal	<ul style="list-style-type: none"> • Understanding of concepts from a range of areas, including some outside engineering, and the ability to evaluate them critically and to apply them effectively in engineering projects. • Apply advanced problem-solving skills, technical knowledge and understanding to establish rigorous and creative solutions that are fit for purpose for all aspects of the problem including production, operation, maintenance and disposal • Demonstrate the ability to generate an innovative design for products, systems, components or processes to fulfil new needs. • Understanding of the key drivers for business success, including innovation, calculated commercial risks and customer satisfaction.
Design report & project proposal	<ul style="list-style-type: none"> • Ability to use fundamental knowledge to investigate new and emerging technologies • Plan and manage the design process, including cost drivers, and evaluate outcomes • Understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate • Understanding of the use of technical literature and other information sources • Ability to work with technical uncertainty • Apply their skills in problem solving, communication, working with others, information retrieval and the effective use of general IT facilities • Exercise initiative and personal responsibility, which may be as a team member or leader
Design report & project proposal	<ul style="list-style-type: none"> • Understand and evaluate business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics • Communicate their work to technical and non-technical audiences • Demonstrate wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations • Knowledge and understanding of the commercial, economic and social context of engineering processes • Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, risk assessment and risk management • Ability to apply engineering techniques taking account of a range of commercial and industrial constraints

Programme Threads

Thread	Assessment Title		
	Primary	Secondary	Contributory

Design	Design report & project proposal		
Health, Safety & Risk Assessment	Design report & project proposal		
Sustainability	Design report & project proposal		
Professionalism, Ethics, Diversity and Inclusion			Design report & project proposal
Application of Maths to solve engineering problems		Design report & project proposal	
Industrial Engagement & Site Visits	Design report & project proposal		
Digital Technologies			Design report & project proposal