Module Descriptor Form

Civil and Environmental Engineering

CL390 - Engineering For Global Development

Module Code	CL390	**Module Title**	Engineering For Global Development				
Module Registrar	Cochrane, Mr Neil A						
Other Staff Involved	Dr James J H Dixon (Lecturer)						
Credit Weighting	10	**Semester**	1	**Elective**	No	**Academic Level**	3
Pre-requisites							
Required for							

Module Format and Delivery (hours):

Lectures	Tutorials	Assignments	Labs	Private Study	Total
15	20	60	0	5	100

Educational Aim

This module aims to:

• Introduce students to the role of engineers and engineering for global sustainability.
• Develop student knowledge and understanding of sustainable development principles and the importance of context-appropriate engineering design and implementation.
• Introduce students to the influence that (sometimes competing) environmental, social, economic, political, technological or other factors have on engineering decisions, including the design, implementation, maintenance and evaluation of solutions.
• Develop transferable skills that are key for understanding and solving sustainability challenges.

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Syllabus

This module will teach the following:

Principles of responsible engineering:
• The tenets of sustainability and the implications of engineering decisions at a local and global level , and thus the importance of globally responsible – sustainable - engineering development.

Design:
• Including the process and stages of design (inception, conceptual design, detailed design), preparation of problem statement and design criteria that reflect the design context, techniques for ideas mapping, systematic evaluation of design options (scoring matrices, controlled convergence)

Selecting or designing appropriate engineering solutions:
• Including the relevance of local context to different engineering projects (environmental, socio-cultural, technological, political, economic context) through case studies, and with particular focus on the Social Impact Assessment techniques in the context of responsible development.

Application to real context:
• The above understanding will be developed and applied in the context of a real community through Engineers without Borders (EWB) Engineering for People Design Challenge. Through a group project, students will develop an appropriate engineering solution for a local community under their chosen design area(s) (Water, Sanitation, Energy, Waste, Transport, Digital, Food, Built Environment). Context specific information and data for the target location and community is provided by EWB.

The top projects are submitted for external review and consideration for entry into a national competition, the Engineers without Borders Engineering for People Grand Final.

Learning Outcomes

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

LO: 1	Understand and appreciate the social, economic, and environmental implications of engineering decisions at a local and global level, and thus the importance of globally responsible (sustainable) engineering development.
LO: 2	Identify and explain how and why context-specific factors (including social, environmental, ethical, economic, and commercial considerations) affect engineering judgement and design.
LO: 3	Demonstrate how context-specific factors are considered and implemented in engineering design, including how the problem statement and design criteria are defined, how design options are evaluated, how the final design is developed, and how implementation and maintenance pathways are planned.
LO: 4	Work together effectively to communicate clearly (in oral and written forms, and through visual forms including sketches, drawings and presentations) the technical and non-technical aspects of their proposed designs with reference to context-specific influencing factors.

(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.)

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Assessment of Learning Outcomes - Criteria

Learning Outcome: **1**

	Criteria
1	The ability to describe the principles of sustainable development, and the importance of social, environmental and economic impact.
2	Understanding of how engineering activities can support (or hinder) sustainable development.
3	The ability to identify the range of contexts to which engineering knowledge can be applied

Learning Outcome: **2**

	Criteria
1	The ability to identify a range of context-specific factors and describe the relevance of these factors for different design solutions.
2	The ability to evaluate decisions (design, policy, planning) with regards to sustainable development goals, and with regards to appropriateness to local context – including heritage.

Learning Outcome: **3**

	Criteria
1	The ability to investigate a given context and/or design community and to define a problem and design criteria that reflect context-specific constraints (and strengths)
2	The ability to refer to – and reflect - these constraints in the development and systematic evaluation of design solutions.
3	The ability to ensure fitness for purpose for all design aspects of the problem including production, installation, operation, maintenance and deconstruction/disposal.

Learning Outcome: **4**

	Criteria
1	The ability to communicate important design aspects within the specific context.
2	The ability to justify the proposed design, and the strengths and limitations of this design.
3	The ability to communicate ideas through oral and written forms, and through visual forms including sketches and drawings.

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

To Pass the module, students need to gain a summative mark of: 40%

Description	Semester	Start Week	Duration	Weight	Submission Week	Linked Criteria
Mid-term review (group presentation)	1			15%	5	
Final design review (group presentation)	1			15%	9	
Design Report (group report)	1	1		70%	11	

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Principles of Assessment Feedback

Principles of Assessment are incorporated in the following ways:
• The assessments align clearly to the Learning Objectives.
• Detail on the assessment method, timetable and marking criteria are available to all class participants at the start of the course.
• Mid-term assessment and feedback is designed to feed into improving end-of-semester assessments.
• Assessment is provided against clearly defined criteria.

Principles of Feedback are incorporated in the following ways, with the purpose of supporting effective learning and skills development.

* Informal feedback *

Peer-to-peer:
• Within-group feedback: as students work together in their design groups they will give and receive feedback amongst group members.
• Between-group feedback: Tutorials together with other design groups will provide opportunity to give and receive feedback between groups.

Staff-to-student:
• Weekly 'drop-in' style tutorials support frequent interaction and dialogue between teaching staff (incl. class registrar, guest contributors, and demonstrators) and students (groups / individuals) to support student development of learning of the global dimension of engineering, and engineering for sustainable development in particular, and to feedback on the group design project and progress.
• A structural compulsory tutorial midway through the semester will provide specific feedback on progress to each design group prior to mid-term assessment.

Student-to-staff:
• within classes there will be polls, and also Engineers without Borders administer a two-wave survey at the start and end of the semester.
• A MyPlace forum will enable groups to ask questions about any aspect of the course between synchronous engagement.
• Tutorials will include opportunity for dialogue on what is working well and what is working less well about the class.

* Formal feedback *

Peer-to-peer:
• Within-group feedback: there will be a compulsory peer-assessment element for each group assignment.
• Between-group feedback: for group presentation assignments, design groups will provide feedback to other design groups.

Staff-to-student:
• Formal feedback will be provided for all assessments (mid-term and final design review, and the design report).
• General feedback from Module Evaluation Surveys and all assessments will be presented in class or via audio or written feedback.
• MyPlace will be used for delivering feedback and to make assessment forms/criteria are accessible to students.

Student-to-staff.
• Students will provide formal feedback via Module Evaluation Surveys.
• A class-specific evaluation form will be provided at end of the semester where students can anonymously give their views on any aspect of the class and suggest improvements.

At all times, feedback will be given with the aim of promoting effective student learning and supporting student development.

Feedback will be delivered in a fair and transparent way. The methods of assessment and feedback will be clearly communicated to all students. The feedback practice is continuously reviewed to ensure that this objective is being met.

Additional Information

Resit Procedure

Students must gain a summative mark of 40% to pass the module. All coursework is compulsory and is a submission is a requirement of the module. Failure to submit any coursework will result in the student being considered as absent from the module.

Students who fail the module at the first attempt or who are absent in the first attempt will be re-examined during the summer resit diet. This re-examination will consist entirely of coursework. No marks from any previous attempts will be transferred to a new resit attempt. Failure to submit any resit coursework will result in the student being marked as absent from the resit.

Recommended Reading

Essential reading:
• All students must read the Design Brief provided at the start of semester.
• Supporting reading and other resources such as TED talks will be provided to students at relevant points through the Semester via MyPlace.

Highly recommended reading:
978-1509540327: Cohen M (2020), Sustainability

For reference:
• A Whole New Engineer: The Coming Revolution in Engineering Education. Book by Catherine Whitney, David E. Goldberg, and Mark Somerville
• There Is No Planet B: A Handbook for the Make or Break Years. Mike Berners-Lee
• Royal Academy of Engineering (2007) Creating Systems that work Principles of engineering systems for the 21st century

• Sustainable community development: from what's wrong to what's strong | Cormac Russell | TEDxExeter
• Learning from failure | David Damberger | TEDxYYC
• The danger of a single story | Chimamanda Ngozi Adichie

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Module Timetable

Week	Semester 1	Semester 2
0		
1		
2		
3		
4		
5	In Person 15%	
6		
7		
8		
9	In Person 15%	
10		
11	Submission 70%	
E		

Date of Last Modification

28-08-2025