

MODULE DESCRIPTION FORM



DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

CL136 The Environment and Infrastructure

Module Registrar: Dr Jen Roberts	Taught To (Course): Civil Engineering; Civil and Environmental Engineering;		
Other Lecturers Involved: Dr Christopher Gallagher Dr Douglas Bertram Guest lecturers from industry and/or government.	Credit Weighting: 10	Semester: 2	
Assumed Prerequisites: None	Elective class	Academic Level: 1	

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

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
10	2		12		6	25	25	20	100

Educational Aim

This module aims to provide a broad understanding of contemporary global challenges, and the environmental, economic & social contexts in which civil engineers design & build infrastructure in response to societal needs. The class develops student skills in whole-systems thinking and examines historical and contemporary case studies concerning the environment & people and their critical relationship with civil engineering professional practice, now and into the future.

Learning Outcomes

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

LO1 Understand and describe the principles of sustainable development, and global sustainability challenges as defined by the United Nations Sustainable Development Goals.

LO2 Understand and give examples of the role of engineers and engineering in tackling sustainability challenges at local to global scales

LO3 Understand the principles of developing and applying sustainability objectives in engineering projects, and critically reflect on sustainable development in practice.

LO4 Work together effectively to evaluate, summarise and communicate information in oral and written forms.

Syllabus

The module will include the following:

- **Principles of sustainable development:** Including definition of sustainability and sustainable development.
- **Global environmental challenges:** Contemporary sustainability challenges defined by the United Nations Sustainable Development Goals (UN SDGs) and the role of engineers and engineering in tackling the SDGs. Some challenges will be examined in more detail, including [but not restricted to] climate action, infrastructure, water, sustainable cities and communities, equality and energy.
- **Assessing sustainability:** An introduction to approaches to assessing sustainability (including life cycle assessment, impact assessment, re-cycling, circular economy) and the importance of engineering context on influencing/governing sustainability.

- **Sustainable development within engineering practice:** examples of how sustainable development objectives are integrated within engineering projects, including managing complexity, taking value-based decisions and designing sustainable solution(s).
- **Skills for sustainable development:** including reflective thinking, systems thinking, group work and communication.

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 Understand and describe the principles of sustainable development, and global sustainability challenges as defined by the United Nations Sustainable Development Goals.

- C1 Awareness of how sustainability can be defined and assessed
- C2 Awareness of the United Nations Sustainable Development Goals (SDGs)

LO2 Understand and give examples of the role of engineers and engineering in tackling sustainability challenges at local to global scales

- C1 Ability to demonstrate how engineering and related topics can provide key solutions to the SDGs
- C2 Appreciation of current and future challenges for engineers including: climate resilience of infrastructure, delivering net zero, resource management, tackling inequalities.
- C3 Understanding of how economic, environmental and social issues can be balanced to obtain sustainable solutions to key contemporary challenges.

LO3 Understand the principles of developing and applying sustainability objectives in engineering projects, and critically reflect on sustainable development in practice.

- C1 Understanding of how sustainable development objectives are incorporated within engineering projects.
- C2 Awareness of different approaches to assessing sustainability.
- C3 Ability to evaluate and reflect on approaches to define and evaluate sustainable development objectives

LO4 Work together effectively to evaluate, summarise and communicate information in oral and written forms.

- C1 Ability to seek, interpret and summarise information from case studies, and cite information source.
- C2 Ability to work in small groups on a shared task, and deliver outcomes in professional and timely manner
- C3 Ability to communicate through oral, written and visual forms.

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/http://www.strath.ac.uk/learnteach/informationforstaff/staff/assessfeedback/12principles/>)

Please state briefly how these are incorporated in this module.

1. Assessment is coursework based. The coursework, assessment framework, and timelines are clearly explained to students at the start of the course, and reiterated at key points in the semester.
2. Coursework is types and timelines are specifically designed so that mid-semester feedback will support end semester submission.
3. All assessments are clearly related to the learning outcomes and assessment feedback is provided against clearly stated criteria.
4. The class includes several different opportunities to provide informal and formal feedback on class activities, engagement, and performance, at individual/group/class level, and two-way (staff-to-student, and student-to-staff), and also includes peer-to-peer feedback within groups.
5. At all times, feedback will be given with the aim of promoting effective student learning and supporting student development, and feedback will be delivered in a fair and transparent way.
6. The assessment and feedback practice is continually reviewed to ensure that these objectives are met.

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

	Examinations			Courseworks		Projects		
	Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting
L/Outcomes					4	100		
					LO1-4			

Indicate which learning outcomes (L01, L02 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines (*academic weeks*):

Week 6 & Week 10

Resit Assessment Procedures:

Resubmission of coursework(s) prior to commencement of the August exam diet.

PLEASE NOTE:

Students must gain a summative mark of 40% 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

Specific reading and resources will be signposted within relevant class sessions on Myplace.

Background reading that provides a general overview of the topic areas covered by the class includes:

*Cohen M (2020), Sustainability, https://www.politybooks.com/bookdetail?book_slug=sustainability--9781509540310

*Broadbent O (2012) Embedding Sustainability in the Undergraduate Civil Engineering Curriculum <https://thinkup.org/reports/embedding-sustainability-in-the-undergraduate-civil-engineering-curriculum/>

*Charles Ainger and Richard Fenner (2014) [Sustainable Infrastructure: Principles into Practice](#)

Additional Student Feedback

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

Date	Time	Room No

Session:

Approved:

Course Director Signature:

Date of Last Modifications:

(Updated May 2018)

MODULE TIMETABLE

Module Code:

CL136

Module Title:

The Environment and Infrastructure

Brief Description of Assessment:

Coursework portfolio: 50% group work, 50% individual, partitioned as follows:

- Group Poster #1 – SDG and engineering: 25% Week 6
- Reflective Diary 1 (weeks 1-6): 20% Week 6
- Group Poster #2 - Sustainability in engineering practice: 25% Week 10
- Reflective Diary 2 (weeks 7 – 10): 30% Week 11

Assessment Timing:-

Indicate on the table below the start/submission dates for each assignment/project and the timing of each exam/assessment using the dropdowns provided. Dropdowns can be left blank. Add extra notes below the dropdowns.

Please note: Timings can and will change, this should only be used as a guide.

Semester One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item.											

Semester Two	C&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Course work Set Project Set	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Course work Submit Project Submission	Choose an item. Choose an item.	Project Submission Choose an item.	Course work Submit Choose an item.	Choose an item.			