

Module specification

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Refer to the module guidance notes for completion of each section of the specification.

Module code	AUR627
Module title	Design for Climate Resilience
Level	6
Credit value	20
Faculty	FAST
Module Leader	Louise Duff
HECoS Code	100148
Cost Code	GABE

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BSc Civil Engineering Studies	Core

Pre-requisites

N/A

Breakdown of module hours

Learning and teaching hours	24 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	24 hrs
Placement / work based learning	0 hrs
Guided independent study	176 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	13/4/21
With effect from date	01/09/21
Date and details of revision	
Version number	1

Module aims

The aim of this module is to provide an introduction to the basis of climate change and environmental impact and consider what adaptation and mitigation techniques and methods can be offered as a solution to reduce impact and improve infrastructure design resilience.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Develop and apply knowledge and a critical understanding of the basis and impact of climate change and extreme weather.
2	Evaluate the effectiveness of a selection of assessment tools and methodologies that can be used to provide a holistic sustainable approach to design, that considers aspects such as climate change, net zero carbon, sustainable design, community impact, resilience, energy use and environmental impact.
3	Apply knowledge and understanding of climate changes to a negotiated case study based on a reported example or an active civil engineering/ construction infrastructure project.
4	Critically appraise design and technical solutions to infrastructure /construction problems and critically evaluate how the decisions and solutions provide design for climate resilience.

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment 1 will comprise of an individual report delivered via an Individual Oral presentation which will consider current climate related issues and environmental assessment techniques, relating directly to student nominated civil engineering project.

Assessment 2 will comprise of Group Project which will consider the design and justification of a climate resilience proposal for a tutor nominated civil engineering scheme.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1,2	Oral Assessment	50%
2	3,4	Group Project	50%

Derogations

N/A

Learning and Teaching Strategies

The module will comprise of on line lectures and seminar based learning to provide the underlying knowledge of the subject. This will be followed by seminars and group tutorials where construction resilience design strategies and technical solutions for case studies will be discussed. Guest lecturers with specific topic expertise will be encouraged, from within the University or through the professional network related to the Built Environment.

Indicative Syllabus Outline

Climate change - climate-related data, extreme weather, local and global impacts on the Built Environment

Rethinking Resources - materials, waste, pollution

Renewable Energy -Decarbonization of electricity and fuels

Methods of Environmental Assessment

Adaptation, Risk and Resilience for ecological, social, or economic systems

Net Zero carbon infrastructure, building and city adaptation design and delivery

Coastal and Fluvial flood resilience

Active Travel cycle and walking

Technological influences – home working, electric /hydrogen automated vehicles, drones, Real Time Structural Monitoring, Portfolio Risk, Resilience data sharing and effective information management

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

Hamin, E., Abunnasr, Y. and Ryan, R., (2019) *Planning for Climate Change: A Reader in Green Infrastructure and Sustainable Design for Resilient Cities*. New York, Routledge.

Coaffee,J., Lee.,P (2016) *Urban Resilience*. London. Pelgrave.

Other indicative reading

Wamsler, C. (2014) *Cities, Disaster Risk and Adaptation*. Oxon. Routledge

Trogal, K., Bauman, I., Lawrence, R., Petrescu, D., (2019) *Architecture & Resilience*, Oxon. Routledge

[Institution of Civil Engineers](#)

[Institution of Structural Engineers](#)

[Institute of Highway Engineers](#)

[CIHT](#)

[IHSTI](#)

[The Intergovernmental Panel on Climate Change](#)

[UK Climate Act](#)

Other indicative reading will be made available via the VLE.

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

Core Attributes

Engaged
Creative
Ethical

Key Attitudes

Commitment
Resilience
Adaptability

Practical Skillsets

Digital Fluency
Organisation
Leadership and Team working
Critical Thinking
Emotional Intelligence
Communication