MODULE DESCRIPTOR

Module Title

Retrofitting: Context, Assessment and Response

Reference	SUM503	Version	1
Created	July 2021	SCQF Level	SCQF 11
Approved	January 2022	SCQF Points	30
Amended		ECTS Points	15

Aims of Module

To set the overall context for retrofit in terms of climate change mitigation, comfort, energy performance and embodied carbon; establish key determinants and relationships; and identify the principal risk factors and barriers to implementation at scale.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Critically appraise the implications of climate, microclimate, building form and fabric, and construction type on the development of effective, retrofitting strategies.
2	Identify the risks and consequences of unanticipated or uncontrolled heat and moisture movement through building spaces and fabric.
3	Critically appraise the role of airtightness and ventilation in achieving effective energy performance, comfort, and moisture robust solutions.
4	Demonstrate a critical understanding of barriers to effective retrofit, the relationship between performance, cost and disruption, and the role of various stake holders in achieving project success.
5	Critically evaluate scenarios and select and justify appropriate strategies in terms of building performance, embodied energy / carbon, and environmental impact.

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Indicative Module Content

This module provides the overall context for the course by examining the need for deep, 'design-led' building retrofit in order to achieve the current climate change mitigation targets. Barriers to decarbonisation are identified, and the importance of judgement about the implications of retrofit solutions on architectural character and quality is introduced. Weekly topics include: the energy context; climate and microclimate; thermal comfort; construction typologies; basic surveying practices; heat and moisture movement; airtightness and ventilation; the limitations of standard retrofit practices; the frameworks for certification and relevant standards; environmental performance and whole life cycle energy/carbon of materials; low carbon heating and ventilation systems, implications of Cost/Performance/Disruption triangle and the role of stakeholders in achieving retrofit goals and success.

Module Delivery

Course delivery takes place through structured online lectures (the majority of which are pre-recorded), designated reading material and directed study, group exercises and discussion forums, and study activities / exercises. Learning is facilitated by regular online tutor support. Students follow a weekly Study Guide detailing learning activities and engagement expectations. Asynchronous engagement by students within a specified and allotted timeframe allows students to follow the module teaching plan, comprising a series of subjects / topics, at their own individual pace.

Indicative Student Workload	Full Time	Part Time
Contact Hours	15	15
Non-Contact Hours	285	285
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	300	300
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	100%	Outcomes Assessed:	1, 2, 3, 4, 5
Description:	Assessment is in the form of an individually prepared portfolio of specific activities / outputs related to the module content.				

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MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

The overall module grade is based on 100% weighting of Component 1 (portfolio). An overall minimum grade D is required to pass the module. Non-submission will result in an NS grade.

Module Grade	Minimum Requirements to achieve Module Grade:
A	A
B	B
C	C
D	D
E	E
F	F
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	Fylan, F., & Glew, D. (2021a). Barriers to domestic retrofit quality: Are failures in retrofit standards a failure of retrofit standards? Indoor + Built Environment, , 1420326. doi:10.1177/1420326X211027197
2	Hegger, M., Fuchs, M., Stark, T., & Zeumer, M. (2012). Energy manual: sustainable architecture. Walter de Gruyter.
3	Cost-Effective Energy Efficient Building Retrofitting: Materials, Technologies, Optimization and Case Studies Pacheco-Torgal, Fernando ; Granqvist, Claes-Goeran ; Jelle, Bj? Peter ; Vanoli, Giuseppe Peter ; Bianco, Nicola ; Kurnitski, Jarek ; Kurnitski, J ; Bianco, N ; Pacheco-Torgal, F ; Granqvist, Claes G?ran ; Vanoli, GP ; Jelle, BP 2017
4	Morgan, C. (2018). Sustainable Renovation: Improving Homes for Energy, Health and the Environment. Pebble Trust.
5	Roberto, G., & Vallentin, R. (2014). Passive house design a compendium for architects. Munchen: DETAIL. doi:10.11129/detail.9783955532215
6	Zhivov, A. M., & Lohse, R. (2020). Deep energy retrofit : A guide to achieving significant energy use reduction with major renovation projects. Cham, Switzerland: Springer.