1. **Title of the module**

ARCH8290 (AR829) – Monitoring and Modelling of Environmental Performance

1. **School or partner institution which will be responsible for management of the module**

Kent School of Architecture

1. **The level of the module (e.g. Level 4, Level 5, Level 6 or Level 7)**

Level 7

1. **The number of credits and the ECTS value which the module represents**

30 credits (15 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Spring

1. **Prerequisite and co-requisite modules**

None

1. **The programmes of study to which the module contributes**

MSc Architecture and the Sustainable Environment

1. **The intended subject specific learning outcomes.
On successfully completing the module students will be able to demonstrate:**

8.1 An awareness of the range of techniques appropriate for analysing the environmental performance of the built environment (internal and external environment) and energy performance of buildings.

8.2 A systematic understanding of the capabilities of both physical and digital experimental techniques (monitoring & modelling) for assessing the environmental and energy performance of buildings.

8.3 The ability to independently assess the environmental and comfort conditions in the built environment through both physical and digital experimental techniques (monitoring & modelling), along with the energy consumption of buildings (thermal simulation modelling).

8.4 A critical understanding of the output of the above techniques and the way they can be used for comprehensive analysis of the environmental end energy performance of buildings and subsequent mitigating strategies.

1. **The intended generic learning outcomes.
On successfully completing the module students will be able to demonstrate:**

9.1 An understanding of basic research principles and the ability to critically analyse material to form independent conclusions.

9.2 A systematic understanding of the effect of the built environment (microclimate, morphology, materials) on the environmental performance and energy consumption of buildings.

1. **A synopsis of the curriculum**

Students will explore a range of experimental and modelling techniques to evaluate the environmental and energy performance of buildings. This will include field surveys of appropriate case study buildings, where the students will experiment with monitoring the environmental conditions. They will select a range of techniques for the thermal and visual environment.

Subsequent modelling of the building will enable them to further assess the environmental conditions and energy performance of buildings, identifying problem areas with appropriate mitigation techniques.

1. **Reading List (Indicative list, current at time of publication. Reading lists will be published annually)**

Baker, N., and Steemers, K. (2000). *Daylighting Design: A Handbook for Architects and Engineers*. James + James.

BUS Ltd Occupancy Survey: Usable Buildings (free resource) http://www.usablebuildings.co.uk/

CIBSE TM22: Energy Assessment and Reporting Methodology

de Dear, R. J. (1998) ‘A global database of thermal comfort experiments’, ASHRAE Technical Data Bulletin, vol 14, no 1, pp15–26

Guildford J P (1954). *Psychometric Methods*. McGraw Hill, New York.

Humphreys, M.A. and Nicol, J.F. (2000). The effects of measurement and formulation error on thermal comfort indices in the ASHRAE database of field studies ASHRAE Transactions 106(2) pp 493-502

Humphreys, M.A., Nicol, J.F. and Raja, I A. (2007). Field studies of indoor thermal comfort and the progress of the adaptive approach. Journal of Advances on Building Energy Research 1, 55-88.

Mardaljevic, J. (2000). Simulation of annual daylighting profiles for internal illuminance. Lighting Research & Technology, 32(3):111–118.

Stevens, S. (1975). *Psychophysics: Introduction to its perceptual, neural and social prospects*. New York: John Wiley.

1. **Learning and Teaching methods**

Total contact hours: 40

Private study hours: 260

Total study hours: 300

1. **Assessment methods.**

13.1 Main assessment methods

Case Study Analysis (100%)

13.2 Reassessment methods

Like for like.

1. ***Map of Module Learning Outcomes (sections 8 & 9) to Learning and Teaching Methods (section12) and methods of Assessment (section 13)***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 9.1 | 9.2 |
| **Learning/ teaching method** |  |  |  |  |  |  |
| **Private Study** | **X** | **X** | **X** | **X** | **X** | **X** |
| Lectures and workshops | **X** | **X** | **X** | **X** | **X** | **X** |
| Tutorials | **X** | **X** | **X** | **X** | **X** | **X** |
| Seminar / crit |  | **X** | **X** | **X** | **X** | **X** |
| **Assessment method** |  |  |  |  |  |  |
| Case Study Analysis | **X** | **X** | **X** | **X** | **X** | **X** |

1. **Inclusive Module Design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered:**

Canterbury

1. **Internationalisation**

Lectures, seminar teaching and tutorials will continue to draw on international source materials for historical and contemporary examples and theories of sustainability and design.

**FACULTIES SUPPORT OFFICE USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs( Q6&7 cover sheet) |
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Revised FSO Jan 2018