Glasgow School of Art Course Specification
Course Title: Building Energy Modelling

Please note that this course specification is correct on the date of publication but may be subject to amendment prior to the start of the 2023-24 Academic Year.

Course Code:	HECOS Code:	Academic Session:
PELC206		2023-24

1. Course Title:
Building Energy Modelling

2. Date of Approval:	3. Lead School:	4. Other Schools:
PACAAG April 2022	Mackintosh School of Architecture	This course is available to students on PGT programmes which include a Stage 2 elective.

5. Credits:	6. SCQF Level:	7. Course Leader:
20	11	Dr Filbert Musau

8. Associated Programmes:
This course is available to students on PGT programmes which include a Stage 2 elective.

9. When Taught:
Stage 2, taught as a blended PGT Elective

10. Course Aims:

The overarching aims of the stage 2 electives are as follows:

- Encourage interdisciplinary, critical reflexivity from within an open set of choices;
- Foster deep investigative approaches to new or unfamiliar areas of practice and theory;
- Cultivate self-directed leadership and initiative-taking in both applied and abstract modes of practice/ study not necessarily associated with a student's particular creative specialism;
- Enable flexible, ethical exploration and connection of diverse knowledge and understanding within a specialist programme of study.

The specific aims of the elective are as follows:

- To develop a critical awareness of the importance of building energy modelling;
- To develop a systematic understanding of the capabilities of selected modelling tools;
- To develop an awareness of the latest building energy modelling tools and the key factors to consider in selecting tools;
- To impart a comprehensive understanding of the operational principles of selected modelling tools;
- To practically demonstrate the application of a comprehensive modelling tool.

11. Intended Learning Outcomes of Course:

On completion of this course students should be able to:

1. Appreciate and articulate the importance of building energy modelling
2. Distinguish the capabilities of different energy modelling tools
3. Select modelling tools for appropriate tasks
4. Apply energy modelling procedures and strategies
5. Use selected tools to model given contexts
6. Analyse data, discuss, and make inferences from modelling results.

12. Indicative Content:

- The role of modelling in the design process
- The role of modelling in energy performance evaluation
- Categories of building energy modelling tools and their capabilities
- Tool selection
- Modelling procedures
    - Tactical concerns and limitations
        - Accuracy of replication
        - Completeness of data input
        - Modelling versus reality
    - How to use building energy modelling software
- Procedures for analysis of data from modelling
- Case studies
- Modelling project

13. Description of Summative Assessment Methods:

On this course students will be assessed on their ability to:

1. Use a selected modelling software to model a given context
2. Competently apply energy modelling procedures and strategies for modelling inputs to ensure a high level of accuracy of modelling outputs
3. Analyse, present and discuss modelling results
4. Make inferences on the impacts of different energy factors on the performance of the modelled building.

Assessment Method	Description of Assessment Method	Weight %	Submission week (assignments)
Submission of written report (or equivalent as agreed with tutor)	Up to 3500-word modelling project report, including graphics, energy and environmental analysis of simulation results. Project tasks and the building to be modelled to be agreed with tutor.	100	Week 11, Semester 2

13.1 Please describe the Summative Assessment arrangements:

The modelling project report should include graphics, energy and environmental analysis of simulation results. Project tasks and the building to be modelled should be agreed with tutor.

14. Description of Formative Assessment Methods:

Engagement with formative assessment is a mandatory requirement.

14.1 Please describe the Formative Assessment arrangements:
At week 5, students will receive formative feedback based on a review of their individual simulation model at their studio computer workstation. Feedback will be provided to the entire class on common issues identified during individual reviews. Students will also receive individual feedback in week 10 – on their advanced simulation model and draft report before the final submission. All feedback will directly link to the assessment criteria in section 10.

15. Learning and Teaching Methods:	
Formal Contact Hours	**Notional Learning Hours**
20	200
15.1 Description of Teaching and Learning Methods:	
Timetable: 2 hours per week offered over 10 weeks, Wednesdays pm.	

16. Pre-requisites:
Knowledge of the principles of energy balance in buildings

17. Can this course be taken by Exchange/Study Abroad students?	No
18. Are all the students on the course taught wholly by distance learning?	No
19. Does this course represent a work placement or a year of study abroad?	No
20. Is this course collaborative with any other institutions?	No
20.1 If yes, then please enter the names of the other teaching institutions:	
N/A	

21. Additional Relevant Information:
N/A

22. Indicative Bibliography:
1. CIBSE GUIDE F: Energy efficiency in buildings 2. CIBSE APPLICATION MANUAL: AM11 Building energy and environmental modelling 3. Journal of Building Performance Simulation 4. Clarke, J. (2001) Energy Simulation in Building Design. Routledge; 2nd ed. 5. Hensen, J. L.M. (Ed.) & Roberto Lamberts, R. (Ed.), (2011). Building Performance Simulation for Design and Operation. Routledge; 1st ed. 6. Malkawi, A. (Ed.) & Augenbroe, G. (Ed.), (2004). Advanced Building Simulation. Routledge; 1st. ed.