

MODULE DESCRIPTOR

Module Title

Advanced Data and Computational Methods for Design

| | | | |
|-----------|---------------|-------------|---------|
| Reference | ACM610 | Version | 1 |
| Created | January 2022 | SCQF Level | SCQF 11 |
| Approved | November 2022 | SCQF Points | 15 |
| Amended | | ECTS Points | 7.5 |

Aims of Module

To equip students with skills in the use of advanced digital tools for the design and evaluation of sustainable architectural solutions, over their whole-life cycle.

Learning Outcomes for Module

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

- 1 Devise and critically evaluate advanced Data Driven methods for Architectural design, taking into account the wider economic, social and environmental context.
- 2 Design strategies and models for circular economy, re-purposing, adaptability of materials, building components, and buildings.
- 3 Develop coherent, credible Design for Manufacture and Assembly structures
- 4 Conduct and critically appraise whole-lifecycle carbon assessment of designs in the early strategic stages of development, including embodied and operational carbon.

Indicative Module Content

Principles of Circular Economies, Material Passports, Whole-lifecycle Carbon Assessment, Data lifecycle of a building, Data strategies for design, Parametric strategies for Design, DfMA strategies, Data Driven Evaluation of Architectural Design, The content is delivered through a series of seminars and lectures, while the students need to develop a research brief using the indicative design methods/content

Module Delivery

2 hours seminar and lecture and presentation followed by a 2 hour hands-on tutorial with tools and application of concepts. Students develop their coursework on both the tutorials and the off-contact hours.

Indicative Student Workload

| | Full Time | Part Time |
|---|-----------|-----------|
| Contact Hours | 46 | N/A |
| Non-Contact Hours | 104 | N/A |
| Placement/Work-Based Learning Experience [Notional] Hours | N/A | N/A |
| TOTAL | 150 | N/A |
| 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 |
| Description: | Technical report incorporating circular economy appraisal, whole-life cycle appraisal Data driven and DfMA approaches to design for a small building/structure. | | | | |

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

The overall module grade is based on 100% weighting of Component 1 (Technical Report). 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

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

INDICATIVE BIBLIOGRAPHY

| | |
|---|--|
| 1 | The Handbook to Building a Circular Economy, RIBA, Cheshire, David |
| 2 | Building Better, Less - Different: Circular Construction, Felix Heisel, ?Dirk E. Hebel, ?Ken Webster, 2022 |
| 3 | Targeting Zero: Whole Life and Embodied Carbon Strategies, Simon Sturgis, 2019 |
| 4 | Data-Driven Design and Construction: 25 Strategies for ...books.google.com ? books, Randy Deutsch, 2015 |
| 5 | Parametricism 2.0 - Rethinking Architecture's Agenda for the 21st Century, Schumacher |