<table>
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<tr>
<th>Module Title:</th>
<th>Module Code: AR7407</th>
<th>Module Leader: John Carter</th>
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<tbody>
<tr>
<td>Technical Report for FDP</td>
<td>Level: 7</td>
<td>Additional Tutors: Trish Andrews, Pat Borer, Gwyn Stacey, Louise Halestrap and visiting tutors and lecturers from the professions</td>
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<td>Credit: 30</td>
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<td>ECTS credit: 15</td>
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Pre-requisite: Integrated Design 1 and 2 and Architectural analysis through writing 1
Pre-cursor: None
Co-requisite: None
Excluded combinations: None
Is this module part of the Skills Curriculum? No
University-wide option: No

Location of delivery: Centre for Alternative Technology

Main aim(s) of the module:

This module offers students the opportunity to systematically and rigorously develop the technical design solutions associated with the FDP comprehensively and to a high level of resolution. In doing so students will draw from previous learning and expand this understanding and develop the ability to apply such knowledge and understanding in an integrated manner as part the design process and in a way that enhances the architecture.

Main topics of study:

**Structure and construction:**
- Structural principles and design strategies, advantages and challenges of systems
- Construction materials, including external and internal finishes, and their assembly and characteristics including durability and sustainability
- Embodied energy assessment calculations
- Introduction to elemental costing calculation and financial implication of design choices and construction systems

**Energy and environmental design and assessments:**
- Thermal design strategies (including insulation, thermal mass, passive solar, day-lighting, ventilation and cooling).
- Thermal transmittance calculations
- Calculation of the relative heat loss through the different construction elements, heat loss through infiltration and ventilation and heat gains from passive sources.
- Estimates of the whole-building specific heat loss (in W/K) and peak heat loss in kW (boiler size).
- Annual heating requirement (in kWh/a and KWh/m2.a) calculations
- Daylight design and assessment methods
- Principles for estimating electrical loads and the annual electricity consumption.
- Introduction to environmental and/or energy assessment tools, benchmarking and simulation modelling etc.

**Comfort & Users:**
- Principles of accessible environments
- Indoor air quality and ventilation and thermal comfort.
- Principles of acoustics (e.g. reverberation times and acoustic separation)

**Services:**
- Principles of heating, cooling and ventilation.
- Principles of artificial lighting strategy, lighting layouts.
- Renewable energy and FiT and RHI.
- Strategies for water supply and sewage, grey water and rainwater disposal.
- Principles of fire prevention and resistance and safe escape configurations
### Learning Outcomes for the module - at the end of this module, students will be able to demonstrate:

*(note reference numbers e.g. GC3.1, relate to ARB criteria of accreditation)*

#### Knowledge of

1. principles associated with designing optimum visual, thermal and acoustic environments (GC9.1)
2. systems for environmental comfort realised within relevant precepts of sustainable design (GC9.2)
3. strategies for building services and ability to integrate these in a design project (GC9.3)

#### Understanding of

4. the impact of buildings on the environment, and the precepts of sustainable design (GC5.2)
5. the role of the architect within the design team and construction industry, recognising the importance of current methods and trends in the construction of the built environment (GC6.2)
6. the investigation, critical appraisal and selection of alternative structural, constructional and material systems relevant to architectural design (GC8.1)
7. strategies for building construction, and ability to integrate knowledge of structural theories and construction techniques (GC8.2)
8. the physical properties and characteristics of building materials, components and systems, and the environmental impact of specification choices (GC8.3)

#### Ability to

9. understand the constructional and structural systems, the environmental strategies and the regulatory requirements that apply to the design and construction of a comprehensive design project (GC1.2)
10. ability to evaluate materials, processes and techniques that apply to complex architectural designs and building construction, and to integrate these into practicable design proposals;
11. critically examine the financial factors implied in varying building types, constructional systems, and specification choices, and the impact of these on architectural design (GC10.1)
12. understand the cost control mechanisms which operate during the development of a project (GC10.2)
13. prepare designs that will meet building users’ requirements and comply with UK legislation, appropriate performance standards and health and safety requirements (GC10.3)

### Teaching/ learning methods/strategies used to enable the achievement of learning outcomes:

- Key principles will be conveyed to students in lectures, seminars and workshops
- Group and one-to-one tutorials with specialist industry professionals and academic staff will support students in their development of their technological design
- Students will be required to further their understanding of the subject areas introduced by academic staff through self-directed research and learning
- Interim formative submissions will enable students to learn and apply the lessons learnt from the feedback to their technology design and final submission

### Reading and resources for the module:

#### Core


#### Construction


**Water**


**Services**


**Energy generation**


**Energy modelling, management and monitoring**


Also refer to reading lists from other modules

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<tr>
<th>Assessment methods which enable students to demonstrate the learning outcomes for the module:</th>
<th>Weighting:</th>
<th>Learning Outcomes demonstrated</th>
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<tbody>
<tr>
<td>Technical report associated with FDP</td>
<td>100%</td>
<td>1-13</td>
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<tr>
<th>Indicative learning and teaching time (10 hrs per credit):</th>
<th>Activity</th>
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<tbody>
<tr>
<td>1. Student/tutor interaction, some of which may be online: hours 70</td>
<td>Tutorials, Workshops, Lectures, Seminars, Studio work, Reviews</td>
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<tr>
<td>2. Student learning time: hours 230</td>
<td>Background research and preparation, Assignment preparation,</td>
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**Total hours 300**