| | | |
|---|---|---|
| **1.** | **Programme Title** | MArch |
| **2.** | **Unit Title** | STUDIO: Design Technology |
| **3.** | **HE Level** | PG - FHEQ Level 7 |
| **4.** | **Unit Code** | MAR17704 |
| **5.** | **Credit Value of Unit** | 15 |
| **6.** | **Unit Type** | Mandatory |
| **7.** | **Unit Tutor** | TBC |

| **8. Indicative Notional Learning Hours** | | | |
|---|---|---|---|
| **Staff – Student Contact** | | **Independent Study Hours** | |
| **Classes**<br>(e.g. lectures, seminars and supervised group activity) | 20 | **Independent Study**<br>(e.g. project development, reading, research and work on online forums) | 105 |
| **Supervised Access to Resources** | 0 | **Preparation for Assessment** | 15 |
| | | **Unsupervised Access to Resources** | 10 |
| **Total** | 20 | | 130 |

## 9. Unit Introduction

Run in combination with the Making Places unit, this unit studies the application of advanced and innovative technologies to a design project. The areas covered include sustainable environmental design, single and compound structural approaches, surface materiality, including new materials and new applications of materials, and new constructional techniques, including prototyping, parametrics and robotics. Students are encouraged to develop a technical strategy in each of these areas for their Making Places designs and then to study in depth the components of that strategy. The study should include future potential developments of these components.

## 10. Aims of the Unit

The unit aims for students to develop the ability to:

- Research alternative current structural, constructional, material and environmental technologies
- Apply them experimentally in detail to a design project in relation to its needs and functions
- Write a reasoned report as to the rationale for the technical decisions made

**And thereby have satisfied the ARB/RIBA Criteria for Part 2 at FHEQ Level 7 as outlined in the Learning Outcomes**

## 11. Indicative Content

- Sustainable Environmental Design

- Complex Structures
- Surface materiality
- Constructional Techniques

## 12. Unit Learning Outcomes

In order to successfully satisfy the learning outcomes students are required to engage with the process of learning. The learning outcomes refer to developing the following **RIBA/ARB Graduate Attributes for Part 2** and **FHEQ Level 7 standards** and must be read in conjunction with these. With regard to meeting the eleven RIBA/ARB General Criteria at Parts 1 and 2, successful completion of this unit will contribute to the award of the Part 2 to students who have:

> **GA2.3** ability to evaluate materials, processes and techniques that apply to complex architectural designs and building construction, and to integrate these into practicable design proposals
>
> **FHEQ Level 7:**
>
> - Typically, holders of the qualification will be able to deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences
>
> - originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline

and upon completion of this unit will be able to demonstrate, in relation to:

> **ARB/RIBA General Criteria for Parts 1 and 2:**
>
> **GC8 Understanding of the structural design, constructional and engineering problems associated with building design.**
>
> The graduate will have an understanding of:
>
> 1 the investigation, critical appraisal and selection of alternative structural, constructional and material systems relevant to architectural design;
>
> 2 strategies for building construction, and ability to integrate knowledge of structural principles and construction techniques;
>
> 3 the physical properties and characteristics of building materials, components and systems, and the environmental impact of specification choices.
>
> **GC9 Adequate knowledge of physical problems and technologies and the function of buildings so as to provide them with internal conditions of comfort and protection against the climate.**

The graduate will have knowledge of:

1 principles associated with designing optimum visual, thermal and acoustic environments;

2 systems for environmental comfort realised within relevant precepts of sustainable design;

3 strategies for building services, and ability to integrate these in a design project.

the following:

| Learning Outcome | Marking Criteria | |
|---|---|---|
| 1 a systematic understanding and a critical awareness of technical problems through the investigation, critical appraisal and selection of alternative contemporary structural, constructional, material, sustainable environmental systems relevant to architectural design strategies for building construction and services. | ☒ Research<br>☒ Analysis<br>☒ Subject Knowledge<br>☒ Experimentation | ☒ Technical Competence<br>☒ Communication & Presentation<br>☒ Personal & Professional Development<br>☒ Collaborative and / or Independent Professional working |
| 2 the ability to evaluate and integrate knowledge of processes and techniques that apply to current environmental, structural and construction principles, and the physical properties and characteristics of building materials, components and systems into practicable design proposals. | ☒ Research<br>☒ Analysis<br>☒ Subject Knowledge<br>☒ Experimentation | ☒ Technical Competence<br>☒ Communication & Presentation<br>☒ Personal & Professional Development<br>☒ Collaborative and / or Independent Professional working |

## 13. Learning and Teaching Methods

This unit will be delivered using a combination of:

- Briefings ☒
- Lectures ☐
- Project work ☒
- Seminars ☒
- Workshops ☒
- Group work ☒
- Online activity ☒
- Individual Presentations and critiques ☐
- Group presentations and critiques ☒
- Self-directed independent study ☒
- Other (describe below) ☐

## 14. Assessment Methods

This unit is assessed holistically (100% of the unit).

- Illustrated report (100%) LO 1-2

Assessment will be against the specified marking criteria.

**All learning outcomes must be achieved at D- to pass this unit.**

## 15. Reading and Resource List

Al-Nageim, H. (2016) *Steel Structures: Practical Design Studies: 4th Revised edition*, Apple Academic Press Inc

Ballard Bell, V. & Rand, P. (2014), *Materials for Architectural Design* vol 1 & 2, Laurence King

Brown, R. (2016) *Architectural Material & Detail: Glass*, Design Media Publishing Ltd

Buhler, B. (2016) *Architectural Material & Detail: Wood*, Design Media Publishing Ltd

Burry, M & J. (2016) *Prototyping for Architects*, Thames & Hudson

Deplazes, Andrea (2013) *Constructing Architecture: Materials, Processes, Structures. 3rd edition:* Birkhauser Verlag

Dickson, M. (2014) *Sustainable Timber Design: Construction for 21st Century Architecture,* Routledge

Ferrando, J. (2016) *Architectural Material & Detail: Concrete*, Design Media Publishing Ltd

Gerber, E. (2016) *Architectural Material & Detail: Advanced Materials*, Design Media Publishing Ltd

Glynn, R. & Sheil, Bob. (2013) *Fabricate: Making Digital Architecture*, Riverside Architectural Press

Gramazio, F, Kohler, M & Willmann, J. (2015) *The Robotic Touch: How Robots Change Architecture*, Park Books

Hall, F. and Greeno, R. (2013) *Building Services Handbook,* Routledge

Keeler, M. and Vaida, P. (2016) *Fundamentals of Integrated Design for Sustainable Building*, Wiley

Loschke, S K. (2016) *Materiality and Architecture*, Routledge

Menges, A. (2015) *Material Synthesis: Fusing the Physical and the Computational*, Wiley

Merrienboer (2016) *Architectural Material & Detail: Masonary*, Design Media Publishing Ltd

Norman, J. (2016) *Structural timber elements: a pre-scheme design guide*, Exova BM TRADA

Pelsmakers, Sofie (2014) *The Environmental Design Pocketbook,* RIBA Publications

Perez, F. (2016) *Architectural Material & Detail: Metal*, Design Media Publishing Ltd

Schumacher, P. (2016) *Parametricism 2.0: Rethinking Architecture's Agenda for the 21st Century*, Wiley

Silver, Pete and McLean, Will (2014) *Structural Engineering for Architects,* Laurence King

Watts, Andrew (2013) *Modern Construction Envelopes*, Birkhäuser

Watts, Andrew (2016) *Modern Construction Case Studies*, Birkhäuser

Watts, Andrew (2016) *Modern Construction Handbook*, Birkhäuser

**Journals**

Detail

**URLs**

Building Regulations: https://www.gov.uk/government/collections/approved-documents

New, and new uses for, materials: https://materia.nl

Steel: https://www.tatasteelconstruction.com/en_GB/

Timber: https://www.trada.co.uk

Concrete: http://www.concretecentre.com

Brick: http://www.brick.org.uk

Glass: http://www.ggf.org.uk

Stone: http://www.stonefed.org.uk

Metal cladding and roofing: http://www.guidetometalroofing.co.uk

**Further Reading and Resources**

Further reading and resources will be identified in your Project Brief.