**INTERNATIONAL QUALIFICATIONS**

**AND ASSESSMENT CENTRE (IQAC)**

«Approved»

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**2025 y. «16» July**

| Programme | **Foundation Year Diploma in Architecture** | | |
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| **Unit Number/ Unit Title** | **Unit 5 Materials and construction techniques** | | |
| **Cohort Code:** | L03MCT-U5 | | |
| **Unit Level** | 3 | | |
| **Total Credits/Hours** | Total qualification time 200/ Total Guided learning hours 90/ Self-guided learning hours 110 | | |
| **Credits** | 20 CATS/ 10 ECTS | | |
| **Lecturer** | | | |
| **Start Date** | | **End Date** | |

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| **Unit Aims** | To provide students with an understanding of materials and construction techniques used in architecture. This module covers the properties, applications, and sustainability of different building materials. |
| **Differentiation Strategies** *(e.g. planned activities or support for individual learners according to their needs)* | Various approaches to addressing the various identified students needs will be adopted throughout the lesson. Such will include:<br>1. Progressive tasks<br>2. Digital resources<br>3. Verbal support<br>4. Variable outcomes<br>5. Collaborative learning<br>6. Ongoing assessment<br>7. Flexible-pace learning |
| **Equality & Diversity** | Variety of teaching techniques will be employed to ensure that the needs of each individual learner are met. |

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| **Safeguarding & Prevent** | Safeguarding policies and the Prevent duty are strictly observed to ensure the safety, well-being, and inclusivity of all students and staff. |
| **Health & Safety** | SIRM H&S policies will be maintained. |
| **Learning Resources** | **Teaching and Learning Materials**<br>• "Materials for Architects and Builders" by Arthur Lyons.<br>• "Building Construction Illustrated" by Francis D.K. Ching.<br>• "Sustainable Construction: Green Building Design and Delivery" by Charles J. Kibert.<br>• "Fundamentals of Building Construction: Materials and Methods" by Edward Allen and Joseph Iano. |

| Learning Outcome | Assessment Criteria |
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| **1. Understand the properties and applications of construction materials.** | **1. Written Assessments:**<br>1.1 Explain the key properties (e.g., strength, durability, thermal conductivity) of common construction materials.<br>1.2 Describe the applications and suitability of different materials in architectural contexts. |
| **2. Demonstrate knowledge of traditional and modern construction techniques.** | **2. Practical Assessments:**<br>2.1 Demonstrate the use of traditional construction techniques (e.g., masonry, timber framing) through practical exercises.<br>2.2 Apply modern construction methods (e.g., prefabrication, sustainable construction techniques) in design projects. |
| **3. Evaluate sustainable building practices and material selection.** | **3. Research and Analysis Assessments:**<br>3.1 Research and analyze the environmental impact of various construction materials.<br>3.2 Evaluate sustainable building practices and their impact on design and construction. |
| **4. Apply material selection and specification principles.** | **4. Project Assessments:**<br>4.1 Select appropriate materials for specific architectural projects based on design requirements and sustainability criteria.<br>4.2 Develop material specifications that meet project objectives and regulatory standards. |
| **5. Critically analyze case studies of construction projects.** | **5. Case Study Assessments:**<br>5.1 Analyze case studies of notable construction projects, focusing on material selection, construction techniques, and sustainability practices.<br>5.2 Draw conclusions and recommendations based on the analysis of case studies. |

| No | Topic | Learning Outcomes for Each Topic | Which assessment criteria does the session relate to? | Day/month/ year/ signature |
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| **1** | Introduction to Construction Materials and Their Role in Architecture | Understand the importance and types of materials used. | LO1 | |
| **2** | Physical and Mechanical Properties of Materials (Strength, Durability, Density) | Learn how material properties influence design choices. | LO1 | |
| **3** | Thermal, Acoustic, and Fire Performance of Building Materials | Assess materials for environmental and safety performance. | LO1 | |
| **4** | Concrete: Composition, Properties, and Applications | Explore the most widely used structural material. | LO1 | |
| **5** | Steel and Other Metals in Construction | Examine metal use for framing, cladding, and detailing. | LO1 | |

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| **6** | Timber: Types, Treatment, and Structural Use | Understand natural materials and their structural role. | LO1 | |
| **7** | Glass, Plastics, and Composite Materials | Discover materials used for transparency and flexibility. | LO1 | |
| **8** | Traditional Building Techniques: Masonry, Load-Bearing Walls | Learn about pre-modern and vernacular construction systems. | LO2 | |
| **9** | Post-and-Beam and Frame Construction | Explore systems of support and enclosure. | LO2 | |
| **10** | Reinforced Concrete and Steel Frame Construction | Understand modern structural techniques. | LO2 | |
| **11** | Prefabrication and Modular Construction | Learn about speed and efficiency in modern building. | LO2 | |
| **12** | Facade Systems and Cladding Technologies | Discover how building skins function and perform. | LO2 | |
| **13** | Roofing Systems and Materials | Compare flat, pitched, and green roof types. | LO2 | |

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| **14** | Sustainable Material Concepts and Life-Cycle Thinking | Evaluate materials based on environmental performance. | LO3 | |
| **15** | Renewable and Recycled Materials in Architecture | Explore options for circular construction | LO3 | |
| **16** | Midterm | **Midterm assessment** covering all learning outcomes (theory and practical elements) | LO1, LO2, LO3 | |
| **17** | Energy Efficiency in Material Use | Understand embodied energy and insulation values. | LO3 | |
| **18** | Low-Carbon Construction Practices | Learn how choices impact carbon footprints. | LO3 | |
| **19** | Climate-Responsive Construction (e.g., passive house) | Adapt material selection to environmental conditions. | LO3 | |
| **20** | Material Selection Criteria: Performance, Cost, Aesthetics | Apply balanced decision-making in choosing materials. | LO4 | |
| **21** | Specification Writing: Format, Codes, and Standards | Learn how to formally communicate material choices. | LO4 | |

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| **22** | Detailing and Assembly Techniques | Translate materials into constructible components. | LO4 | |
| **23** | Construction Documents: Plans, Sections, Schedules | Read and produce material specifications in drawings. | LO4 | |
| **24** | Mockups and Prototyping in Material Testing | Use physical models to evaluate performance. | LO4 | |
| **25** | Case Study 1: Timber Architecture and its Modern Revival | Critically assess traditional material in new contexts. | LO5 | |
| **26** | Case Study 2: High-Tech Architecture and Material Innovation | Study buildings where advanced materials define design. | LO5 | |
| **27** | Case Study 3: Low-Cost Sustainable Housing | Analyze affordable, green approaches to construction. | LO5 | |
| **28** | Case Study 4: Adaptive Reuse and Material Conservation | Learn how salvaged materials are used in heritage contexts. | LO5 | |
| **29** | Student Presentations: Material and Technique Analysis of Chosen Projects | Practice critical evaluation and communication. | LO5 | |
| **30** | Group Project: Material Specification for a Small Pavilion | Apply knowledge in a collaborative, applied setting. | LO1 – LO4 | |
| **31** | Final Exam | Summarize and project future directions in the field. | LO1 – LO5 | |