INTERNATIONAL QUALIFICATIONS

AND ASSESSMENT CENTRE (IQAC)

«Approved»

2025 y. «___» _____

Programme	**Level 6 Diploma in Architecture**		
Unit Number/ Unit Title	**Unit 3 Advanced Building Technology and Construction Systems**		
Cohort Code:	L06ABTC-U3		
Unit Level	6		
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**	

Unit Aims	This unit equips learners with advanced knowledge of building assemblies, structural innovation, and integrated building systems. It emphasizes coordination between structure, envelope, and services in complex buildings.
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: 1. Progressive tasks 2. Digital resources 3. Verbal support 4. Variable outcomes 5. Collaborative learning 6. Ongoing assessment 7. Flexible-pace learning

Equality & Diversity	Variety of teaching techniques will be employed to ensure that the needs of each individual learner are met.
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** • Allen, E. & Zalewski, W. (2010). Form and Forces. Wiley. • Ambrose, J. & Tripeny, P. (2011). Building Structures. Wiley. • Eastman, C. et al. (2011). BIM Handbook. Wiley.

Learning Outcome (The learner will:)	**Assessment Criteria (The learner can:)**
LO1. Evaluate complex structural systems.	**Compare structural systems (e.g., tensile, modular, hybrid) through case-based analysis.**
LO2. Integrate envelope, structure, and services.	**Demonstrate detailing and coordination in architectural sections.**
LO3. Analyze performance-driven technologies.	**Assess the use of smart façades, passive systems, and responsive elements.**
LO4. Develop constructible technical documentation.	**Produce integrated working drawings and specifications.**
LO5. Examine construction delivery approaches.	**Compare BIM, prefabrication, and traditional workflows.**

No	Topic	Learning Outcomes for Each Topic	Which assessment criteria does the session relate to?	Day/month/ year/ signature
1	Introduction to Advanced Building Technologies	Define the role of integrated systems in high-performance buildings.	LO1	
2	Long-Span Structures and Load Distribution	Analyse the behaviour of trusses, space frames, and shell structures.	LO1	
3	Structural Systems for High-Rise Buildings	Evaluate shear wall systems, braced frames, and core structures.	LO1	
4	Innovative Foundation and Basement Techniques	Examine raft foundations, deep piles, and waterproofing systems.	LO1	
5	Façade Engineering and Cladding Systems	Integrate curtain walls, rainscreens, and ventilated façades.	LO2	

6	Building Envelope: Airtightness and Moisture Control	Coordinate detailing for moisture barriers, membranes, and insulation.	LO2	
7	HVAC Integration in Complex Building Forms	Plan mechanical service routes in coordination with structure and space.	LO2	
8	Structural Openings and Service Penetrations	Detail junctions where structure and services intersect.	LO2	
9	Integration of MEP in BIM Workflows	Use Building Information Modelling for clash detection and systems coordination.	LO2	
10	Smart Building Systems and IoT Integration	Explore automation for lighting, climate control, and energy efficiency.	LO3	
11	Renewable Energy Technologies in Buildings	Evaluate PV panels, wind turbines, and building-integrated solar design.	LO3	
12	Performance Analysis Tools (e.g., IES, EnergyPlus)	Simulate building behaviour in response to environmental inputs.	LO3	
13	Passive Design and Hybrid Systems	Combine natural ventilation, daylighting, and thermal mass with active systems.	LO3	

14	Modular Construction and Pre-fabrication	Analyse benefits and constraints of off-site assembly methods.	LO5	
15	Construction Sequence and Logistics Planning	Develop staged construction timelines considering site access and storage.	LO5	
16	Midterm	**Midterm assessment** covering all learning outcomes (theory and practical elements)	LO1, LO2, LO3	
17	Integrated Detailing for Roof Systems	Coordinate waterproofing, drainage, and insulation layers.	LO2	
18	Fire Protection Systems and Compartmentalisation	Detail fire-stopping, escape routes, and fire-resistant assemblies.	LO2	
19	Vertical Transport Systems: Elevators and Escalators	Integrate lift shafts, M&E services, and structural cores.	LO2	
20	Advanced Materials and Composite Systems	Explore carbon fibre, GFRC, and high-performance concrete.	LO1	

21	Constructing Complex Geometries	Detail and model curved, twisted, or free-form building components.	LO4	
22	Envelope Performance Assessment	Use U-values, SHGC, and thermal bridging to assess façade designs.	LO3	
23	Detailing Sustainable Rainwater Management	Plan green roofs, swales, and stormwater attenuation tanks.	LO3	
24	Documentation: Wall Sections and Assembly Drawings	Produce technical details showing full material build-ups.	LO4	
25	Construction Drawing Set Compilation	Assemble plans, sections, elevations, and schedules for issue.	LO3	
26	Specifications and Technical Notes	Write material specs, tolerances, and performance requirements.	LO3	
27	Site Supervision and Quality Control	Explore role of architects during site inspections and defect checks.	LO5	
28	Health, Safety and Construction Risk Management	Apply CDM regulations and develop site-specific risk assessments.	LO5	

29	Integrated Case Study Analysis	Deconstruct a real building project into structural, envelope, and service systems.	LO1 – LO5	
30	Peer Review: Technical Design Crit	Present technical drawing package for review and feedback.	LO1 – LO5	
31	Final Exam: Final Submission and Reflection	Submit full coordinated technical documentation and project reflection.	LO1 – LO5	