INTERNATIONAL QUALIFICATIONS

AND ASSESSMENT CENTRE (IQAC)

Approved:

2025 y. «___» _____

Programme	**Level 7 Diploma in Architecture**		
Unit Number/ Unit Title	**Unit 3 Smart Cities and Sustainable Urban Futures**		
Cohort Code:	L07SCSU-U3		
Unit Level	7		
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 explores the evolution of smart cities and the architectural responses required to address sustainability, livability, and resilience. Learners will examine the integration of technology, data, and infrastructure in urban development, with a focus on smart mobility, green architecture, and participatory planning. The course promotes interdisciplinary strategies for future-proof urban environments.
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** • Batty, M. (2013). The New Science of Cities. MIT Press. • Townsend, A. (2014). Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia. Norton. • Gehl, J. (2011). Cities for People. Island Press. • Mostafavi, M. & Doherty, G. (2016). Ecological Urbanism. Lars Müller Publishers. • Sennett, R. (2018). Building and Dwelling: Ethics for the City. Farrar, Straus and Giroux.

Learning Outcome (The learner will:)	Assessment Criteria (The learner can:)
LO1. Evaluate the principles and frameworks underpinning smart city development.	Written Report: 1.1 Analyse key technological components (e.g., IoT, GIS, AI) in smart cities. 1.2 Examine global frameworks promoting smart urbanism (e.g., ISO 37120).
LO2. Investigate sustainable design strategies for urban futures.	Case Study Portfolio: 2.1 Evaluate architectural strategies that support urban sustainability. 2.2 Compare low-carbon and net-zero city models globally.
LO3. Propose integrated solutions for future- ready urban environments.	Urban Planning Project: 3.1 Develop a conceptual smart city masterplan incorporating resilient infrastructure. 3.2 Justify design strategies using performance-based criteria.
LO4. Critically assess the social, ethical, and environmental impact of smart cities.	Critical Essay: 4.1 Debate the inclusivity and governance of smart city initiatives. 4.2 Reflect on ethical issues surrounding surveillance, data privacy, and access.

No	Topic	Learning Outcomes for Each Topic	Which assessment criteria does the session relate to?	Day/month/ year/ signature
1	Introduction to Smart Cities	Define core components, goals, and stakeholders in smart city development.	LO1	
2	Historical evolution of urban innovation	Trace key technological and policy shifts influencing urban transformation.	LO1	
3	Smart city frameworks and international benchmarks	Examine frameworks like ISO 37120, ITU, and UN-Habitat in city evaluation.	LO1	
4	Urban data and digital infrastructure	Explore how data collection and digital platforms guide urban governance.	LO1	
5	IoT (Internet of Things) in urban management	Apply IoT use-cases to manage traffic, lighting, and services.	LO1	
6	Smart mobility and transportation systems	Design responsive mobility networks promoting sustainability and accessibility.	LO2	

7	Urban energy systems and renewable integration	Identify energy-efficient models for powering smart urban districts.	LO2	
8	Green buildings and sustainable architecture in smart cities	Evaluate building-integrated environmental systems and certifications.	LO2	
9	Water management and urban resilience	Investigate urban stormwater strategies and smart water grid solutions.	LO2	
10	Waste management and circular economy	Analyse urban waste innovations for closed-loop systems.	LO2	
11	Digital twins and urban simulation	Learn to model real-time data environments for planning and management.	LO1, LO3	
12	Citizen engagement and participatory planning	Develop tools for inclusive planning and bottom-up innovation.	LO3	
13	Responsive public spaces and urban interfaces	Design adaptable spaces reacting to environmental or social inputs.	LO3	
14	Intermodality and transport integration	Coordinate sustainable multimodal transit in city districts.	LO3	

15	Local governance and digital democracy	Review how local policies shape smart urban projects.	LO3	
16	Midterm	**Midterm assessment** covering all learning outcomes (theory and practical elements)	LO1, LO2, LO3	
17	Artificial Intelligence in urban systems	Apply AI to predict patterns and support decision-making in city services.	LO3	
18	Urban inequality and digital divide	Evaluate how technology can both help and hinder equity in cities.	LO4	
19	Data ethics and privacy in smart cities	Address ethical use, storage, and sharing of personal urban data.	LO4	
20	Environmental justice and climate adaptation	Assess smart city strategies for socially fair climate resilience.	LO4	
21	Surveillance, security, and urban freedoms	Critically reflect on the balance between monitoring and public rights.	LO4	
22	Urban design for ageing and inclusive societies	Integrate social inclusion and accessibility into smart environments.	LO4	

23	Smart housing and co-living models	Explore modular and connected housing solutions for changing lifestyles.	LO2, LO3	
24	Case study: Singapore Smart Nation	Evaluate an advanced smart city initiative from multiple perspectives.	LO1 – LO4	
25	Case study: Barcelona's digital urbanism	Analyse democratic governance and citizen-led urban innovation.	LO1 – LO4	
26	Mixed-use urban prototypes and innovation districts	Design high-density, low-impact urban prototypes combining live-work-play.	LO3	
27	Designing for future uncertainty	Apply scenario planning and flexible systems in city design.	LO3	
28	Urban design studio workshop: smart street design	Prototype a smart street section integrating green, tech, and social layers.	LO2, LO3	
29	Group project development: smart & sustainable neighbourhood	Start developing an integrated neighbourhood concept responding to local and global challenges.	LO1 – LO4	
30	Project refinement and stakeholder feedback	Present project drafts and incorporate interdisciplinary feedback.	LO3, LO4	

31	Final Exam: presentations and reflective critique	Deliver final proposals and critically reflect on their design, impact, and feasibility.	LO1 – LO4	