University of the Built Environment
EST. 1919

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Applied Digital Planning in the Built Environment

Module Descriptor

Module Code:	PLN7ADP
Version:	V1.00
Status:	Final
Date:	16/07/2025

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Summary Module Details

Module details

Module Title: Applied Digital Planning in the Built Environment

Module Leader: TBC

Module Mode: Supported online learning

Semester: Autumn (UK)

Level: 7

Credits: 20

Learning Hours: 200

Contact & Study Hours

Directed Study Time: 60 hrs (30%)

Self-directed Study Time: 70 hrs (35%)

Assessment Study Time: 70 hrs (35%)

Assessment Type

Coursework: 100%

Module Summary

This applied module builds on foundational knowledge of Introduction to Digital Planning and AI module, enabling students to critically evaluate, use, and implement digital tools in complex planning and infrastructure contexts. Through a series of real-world challenges, students apply methods such as predictive analytics, digital twins, scenario modelling, and collaborative digital platforms to plan-making and infrastructure management. The module examines emerging technologies and regulatory frameworks, focusing on ethical and resilient digital practice across housing, transport, water, and energy systems. By the end, students will be confident digital practitioners equipped to deliver inclusive, data-informed, and technologically enabled urban solutions.

Taken on which Programmes

MSc Urban Planning (C)

Core (C) or Elective (E)

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Module Aims

By the end of this module, students will be able to:

- Apply digital and AI methodologies to complex planning and infrastructure challenges
- Integrate tools such as digital twins, predictive analytics, and public engagement platforms into professional workflows
- Evaluate the legal, operational, and ethical implications of AI-supported decisions
- Develop strategies for embedding digital thinking within planning and development practice
- Critically reflect on the implications of digital transformation for professional roles, governance, and public trust.

Module Learning Outcomes

LO1. Explain and apply digital and AI tools such as machine learning, optimisation, and digital twins to planning and infrastructure scenarios.

LO2. Critically evaluate how digital technologies and datasets can inform equitable planning and infrastructure decisions.

LO3. Critically analyse the risk and ethical challenges related to digital tools and AI use in the built environment, including automation bias and explainability.

LO4. Integrate digital engagement platforms, data tools and AI to co-design inclusive, sustainable urban strategies.

LO5. Collaboratively produce and present a professional project that addresses a real-world urban issue using digital and AI methods.

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Indicative Module Content

Module topics

The module is divided into the following key themes:

- **Practical applications for digital, data and AI in the Built Environment**

  Core AI principles: machine learning, neural networks, optimisation. Digital twins. Infrastructure case studies: AI in energy grids, smart water networks, and transport control systems.

- **Data and Digital Integration**

  Exploring structured and unstructured data flows in the built environment. Data platforms, IoT sensors, and system interoperability. Analysing operational data from transport and utilities.

- **Predictive Maintenance and Risk**

  Applications of digital techniques and AI in forecasting system failures, scheduling maintenance, and investment prioritisation. Uncertainty modelling and resilience planning. Case study: AI for flood risk infrastructure.

- **Digital Twins and BIM in Lifecycle Management**

  Digital twin use across planning, construction, and operation phases. Integration with CDEs, and SCADA. Cybersecurity considerations. Use of AI-powered twins for live urban systems.

- **Ethics, Regulation, and Professional Standards**

  Understanding the consequences of opaque or biased automation. Making “fair” decisions with AI. The environmental impact of data-driven decisions. Case studies on ethical dilemmas in digital planning. What should go into an ethical AI procurement specification?

- **AI-Enabled Futures: Skills, Failure and Organisational Change**

  Emerging trends: including blockchain and autonomous systems,. Adapting to professional change. Understanding failure modes and recovery. Group task: Develop an AI integration roadmap for a local infrastructure project.

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This content will be reviewed and updated regularly to reflect the legal, moral and financial changes in professional standards and practice.

Overview of Summative Assessment

Module learning outcomes	Assessment	Word count or equivalent	Weighting
LO1, LO2	**Assessment 1** Coursework	2,000	40%
LO3, LO4, LO5	**Assessment 2** Coursework (project and presentation)	3,000	60%

Module Pass Mark (each element is to be passed separately): 50%

Key Module Learning Resources

Core Sources and Texts

The core reading resources within each module will be provided via the specific Virtual Learning Environment (VLE) module pages and within the e-Library. Additional reference material and supplementary resources to support your studies are available through the University of the Built Environment e-Library.

Module tools

Students will have access to study materials, dedicated academic support, student forums, and learning activities via an online learning platform (VLE).

The module page on the VLE is broken down into structured study weeks to help students plan their time, with each week containing a mixture of reading, case studies, videos/recordings and interactive activities to go through. Online webinars/seminars led by the Module Leader can be attended in real time and provide opportunities to consolidate knowledge, ask questions, discuss topics and work through learning activities together. These sessions are recorded to support students who cannot attend and to enable students to recap the session and work through it at their own pace. Module forums on the VLE provide further opportunities to discuss topics with other students, complete collaborative work and get extra help from the module team.

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Professional online resources

The e-Library provides access to trusted, quality online resources, selected by subject specialists, to support students' study. This includes journals, industry publications, magazines, academic books and a dissertation/work-based library. For a list of the key industry specific and education resources available please visit the VLE e-Library.

Other relevant resources

Access is also provided to further information sources that include the British Library and Open University UK catalogues, as well as providing a monthly current awareness service entitled, ***Knowledge Foundations*** - a compendium of news, research and resources relating to the educational sector and the Built Environment.

The module resource list is available on the module VLE page and is updated regularly to ensure materials are relevant and current.

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