



**Fakultät
Architektur
und Bauwesen**

Module Handbook

Bachelor Digital.Design and Production

Technical University of Applied

Sciences Augsburg

based on the Study and Examination Regulations 2025 in the
version dated 15 October 2025

SIM – Simulation

- Covers fundamentals of modelling and simulation in AEC, including deterministic, stochastic, continuous, discrete, and hybrid simulation approaches.
- Focuses on simulation of buildings and urban systems, including system behaviour, performance analysis, and interdependencies in complex environments.
- Introduces human-centred simulation approaches to model user behaviour and its impact on building performance.
- Teaches practical use of simulation tools, including model building, scenario analysis, sensitivity analysis, and validation/verification methods.
- Includes advanced data analysis and visualization techniques to interpret and communicate simulation results effectively.
- Builds competence in designing, implementing, and evaluating simulation models to support decision-making in architectural and engineering projects.

SPUD – Sustainable Parametric Urban Design

- Introduces principles of sustainable urban planning by integrating system dynamics, spatial analysis, and geospatial data (e.g., OpenStreetMap) into design workflows.
- Covers fundamentals of urban systems, including land use, street networks, building form, mobility, and infrastructure as interconnected design elements.
- Focuses on parametric and generative design methods using tools such as Dynamo to create and evaluate urban models.
- Teaches simulation-based assessment of sustainability criteria, including energy use, emissions, daylight access, solar potential, green space, and equity.
- Includes multi-criteria decision-making and life cycle assessment (LCA) to evaluate urban design alternatives.
- Develops the ability to create, analyze, and refine data-driven urban models in multidisciplinary, stakeholder-based planning processes.

AI – Artificial Intelligence

- Introduces core concepts of artificial intelligence, including deep learning, reinforcement learning, search and optimization, and classification methods.
- Covers artificial neural networks and their application in computational problem solving and pattern recognition.
- Focuses on AI applications in civil engineering and the built environment, linking theory to practical use cases.
- Develops understanding of strengths and limitations of different AI approaches for solving engineering and design problems.
- Teaches selection and application of appropriate AI methods for simple project scenarios.
- Builds competence in implementing basic AI techniques in digital construction and data-driven workflows.