



Module Specification

Urban Sentience

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Part 1: Information

Module title: Urban Sentience

Module code: UBLLV1-15-M

Level: Level 7

For implementation from: 2024-25

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Arts, Technology and Environment

School: CATE School of Architecture and Environment

Partner institutions: None

Field: Architecture and the Built Environment

Module type: Module

Pre-requisites: Computing Complexity 2024-25

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module is set up to introduce students to the innovative and creative methods that computational design offers responsible architecture. With the interconnected composing elements and the interactive causation, designers can tackle current global problems, by turning to other sciences (e.g., mathematical and biological systems) to understand how dynamic complex systems emerge. This new architectural, interdisciplinary frontier is aided by codifying the biological and mathematical data to inform generative design. Computational designers consider a

wide range of complex data such as cost, well-being, social cohesion, and physiological response as optimisation indices.

The module challenges the students to work within the paradigm shift centred on the belief that the way we build our cities is no longer sustainable even though we as human beings, still need the built environment. With the growing climate crisis, if we continue to underestimate the effect of the built environment on the ecological systems, including migration patterns, and biological survival and mating calls, we continue to contribute to the detrimental positive feedback loop of collapsing ecological systems. The students are invited to adopt the concept that dictates that we must learn from and reciprocate to ecological and biological systems.

Computational processes afford new ways to develop structural and environmental strategies that allow our cities to integrate with nature as a contributing unit of a homogeneous ecological matrix.

The module is a studio-based module introducing students to design research. The students are invited to work in small teams collaboratively investigating complexity to develop an urban proposal. The scope of the investigation roughly covers a small township or a city neighbourhood. The studio-based module will include a theoretical seminar-workshop focused on the ultimate project's theoretical and academic background. The theoretical investigation and the brief will be defined by the teaching team research and practice, and current events while complementing seminars in other modules.

Features: The module requires teamwork and is assessed by the submission of team project work that is assessed as a single output (where one mark is determined for the project, and all group-members involved in that project receive that mark).

Educational aims: Collectively identify, select, and implement a suitable algorithm to respond to design challenges, towards an innovative solution.

Design and systematically interpret an algorithm that displays the understanding of theoretical knowledge and computational and fabrication methods.

Develop and practice of design skill in computational design within a hierarchal

system (urban, climate, ecology) identify a problem, posing a hypothesis, finding possible solutions, and validating the result.

Practice team-working skills in the development of a proposition for the design of an urban proposal.

Effectively communicate the synthesis of a complex data set in verbal, written, graphical and fabricated media.

Outline syllabus: The module runs as a short, intense 4-weeks architecture studio, with advanced skills lab-based programming and fabrication tuitions, and a theoretical thread introducing students to metaheuristics in computational design and representation, and overview of urban computation design research and practice.

As a design studio, students will be invited to team up in groups of 2-4 students responding to their first given brief. The teaching team will determine the topic and context for the brief (in terms of the subjects for investigation and the design tasks undertaken) at the start of each academic session in response to current national and international agendas and the research and practice interests and specialisms of the teaching team and the department. Every week, the studio will be supported with a full day of desk crits for each group, enabling the team through their self-directed investigation.

The historical, theoretical, and critical understanding of hierarchal systems like urban-scape, along with metaheuristic theory, will be delivered as lectures and seminars over two weeks. The lectures and readings focus on various urban design theories. The students are invited to read and distil seminal texts to be discussed in the seminar sessions. Collaboratively distilling theory and designing an algorithm in an analogue (non-computational) exercise as part of the team's design process, and formatively assessed in presentation format. This milestone allows an interim review within a fast-paced studio.

Part 3: Teaching and learning methods

Teaching and learning methods: 1. An advanced architectural studio:

The module is conducted predominantly by self-directed teamwork. Teaching is provided as expert tutorial advice providing insight on appropriate computational methods, fabrication techniques, modelling, structural design and construction management. These advisory tutorials are programmed to support the student-teams' process of design development. This teaching is understood as a form of expert consultancy provided in support of each team's testing and development process.

2. Lab-based practical skills:

The practical lectures, exercises, and primer project are designed to facilitate competency acquisition through applied and indirect learning, building knowledge by introducing the new subjects and gained coding and scripting skills.

3. Lecture-based, seminar discourse, and self-directed study:

This track enables students to support their independent learning by exploring more profound computation design issues and receiving feedback. Students are exposed to the long track of computational design accumulated during the past two decades and encouraged them to build on that body of work. The introduction of analogue logic exercises and the invitation to abstract the process into visual representation allows students with non-design and design background to understand and communicate complex information

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Interpret urban design and metaheuristic theories and recognise the interrelationship with computation design processes in academia and practice.

MO2 Identify a research question relevant to a critical computational urban design theory and carry out an enquiry-based project in response to a given brief.

MO3 Reflect critically upon ethical issues and identify an enquiry-based exploration for and demonstrate a methodological understanding of relevant computational and fabrication methods of urban design research and practice.

MO4 Explore and communicate key theoretical concepts, computational processes, simulation, and rapid prototyping methods to generate and validate an urban proposal.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 120 hours

Studio sessions = 30 hours

Total = 0

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/43044E39-024F-56A6-B162-C7C280FEFCAB.html?lang=en-GB) via the following link <https://rl.talis.com/3/uwe/lists/43044E39-024F-56A6-B162-C7C280FEFCAB.html?lang=en-GB>

Part 4: Assessment

Assessment strategy: The assessment output for this module, a Teamwork Urban Design Project (Portfolio) will enable the development of communication skills that students will require as architectural practitioners.

Each team submits one comprehensive portfolio incorporating the theoretical process into the design proposal, represented in drawings and 3D models. The deliverables should include experimentation and validation methods underpinned by seminal research and theoretical hypothesis.

The assessment strategy adopted by this module centres on a poster and a supplementary digital portfolio that effectively communicates the computational methods applied in the proposal and the synthesised critical thinking. The students must appreciate the criticality of communicating complex data and logic visually.

Summative assessments: Developing understanding will be evaluated in a visual and verbal presentation of the project's History and Theory research process. Evaluate the practical and theoretical understanding, through the digital portfolio (40

pages sized A3) and the student's ability to understand and represent complex information.

Resit Strategy: Whereas the First Attempt at this module requires work in small teams work; the Resit Attempt is an individual assessment. The scope of the experiments identified for this Resit will be reduced to an appropriate level for an individual to complete the assessment. To this end the resitting student will be provided with a revised design brief with a reduced scope for these experiments, including the theoretical content as part of the project design process. The student will also be asked to reflect on what has been lost, gained, and learned by working individually or in a team.

Assessment criteria will be made available to the students, along with the project brief.

Feedback: there will be peer and tutor feedback throughout the module critiques. The students will be invited to provide self-assessment. Written feedback on completion of the projects.

Assessment tasks:

Portfolio (First Sit)

Description: Teamwork urban proposal.

Weighting: 100 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO1, MO2, MO3, MO4

Portfolio (Resit)

Description: Portfolio: Updated report merging the group theoretical investigation as part of the design process. This should include a reflection of losses, gains, and learnings from individual and teamwork.

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Computational Architecture [Frenchay] MSc 2024-25

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