



Postgraduate in Design for Responsive Environments

POSTGRADUATE IN DESIGN FOR RESPONSIVE ENVIRONMENTS

Start date

February

ECTS Credits

30

Language

English

Qualification

Postgraduate Diploma in Design for Responsive Environments, degree awarded by Universitat de Vic – Universitat Central de Catalunya (UVic-UCC).

Direction

JORDI TRUCO

Architect for ETSAB. Distinction in the Emergent Technologies and Design MArch at the Architectural Association of London. Founding partner of HYBRIDa and teacher on the Master in Biodigital Architecture at the UIC School of Architecture until 2007. Teacher and Director of the Master in Advanced Design and Digital Architecture at Elisava until 2018. Teacher at the Advanced Design Studio at the Pratt School of Architecture in New York. Esherik visiting professor at UC Berkeley for 2011.

Aimed at

The programme is intended as training for:

- Designers, Architects and Engineers that are interested in investigating space design and architecture in the context of innovative technologies and interactive computational design.
- Professionals who can lead or participate in architecture or design studios which use computational design tools and digital fabrication tools or develop complex and innovative architecture.
- Professionals who can lead or participate in architecture or design studios which prioritise singularity, contemporaneity, exploration and innovation in the projects they undertake.
- Professionals who can develop and continue research into the area of design and architecture generated with computational tools in an academic environment, either to develop research, undertake a PhD on the subject or to teach.
- Professionals who wish to continue their career doing research and innovation projects in the industry of digital fabrication, the development of dynamic structures or the development of interactive architecture.

Presentation

It is a fact that the appearance of computation in the world of design has marked a definitive turning point. Computers have opened us to their own logic, allowing us to operate more optimally, quickly and efficiently, but also to enter new logics. They allow us to investigate, experiment and create self-organising systems or emerging systems and to enter into interactive design: buildings, objects or structures that interact with their environments.

On this postgraduate course we focus on the relevance that these new digital paradigms have in the planning process. The programme proposes morphogenetic processes (form and space design) experimenting with software that works with scripting and parameters. With these digital tools we establish the grammar needed to create systems, which will become architectural and inhabitable spaces, and even spaces that interact.

New technologies also bring us towards new production processes (fast manufacturing, digital fabrication) which lead to non-standard forms of architecture and enable us to produce elements that are formally highly complex at a reasonable cost. We study all the production techniques needed to materialise the designs we work on during the course.

A far cry from the modern movement and the strictest architectural rationalism, words like postmodernism, deconstructivism and minimalism no longer sound contemporary, and there are no glimpses of a predominant style on the horizon that may be seen as a model to follow. Rather we are seeing on a daily basis a clear revolution in the digital environment. By entering these new scenarios of design and manufacture, we will come closer to what is contemporary and perhaps to new avant-gardes.

Interaction with the environment and efficiency

Through the incorporation of these new design tools and strategies in the planning process, the course is focused on the design of interactive systems, structures, envelopes or spaces to improve efficiency and achieve a better relationship between the buildings of the future and the environment.

Course aims

- Give the student a competitive and innovative professional profile that includes the latest criteria, trends and project instruments.
- Provide the theoretical foundations that enable students to talk about strategies in contemporary space design and architecture, entering the new paradigms of the digital environment.
- Highlight the dominant role and study of digital fabrication and production systems, which are less conventional and more innovative, but mostly used in well-developed fields like automation and aeronautics.
- Promote the research, exploration and investigation in the project process, in order to produce new project outcomes and open new lines of thinking or reflection.
- Learn more about the study of parametric systems and software, to develop new creative processes of analysis and control.
- Introduce the factors that have enabled the evolution of new materials, which play a crucial role in the future design of our built environment.

Admission requirements

Official university degree or equivalent in Architecture, Product Engineering, Product or Space Design.

Competences

- Be capable of carrying out a creative, non-subjective process, focused on a process methodology.
- Understand the latest theoretical trends in contemporary space design and architecture.
- Easily and efficiently apply both strategic (theoretical process) and instrumental (software) generation tools.
- Be capable of coherently and efficiently using the latest technology and tools applied to design and the fabrication of spaces and architecture.
- Be able to explore and investigate in the project process, thereby opening new lines of thought and reflection.
- Dominate work phases and the professional planning of space projects with computational tools.
- Be capable of delivering solutions that solve complex problems in a space project with computational tools.
- Offer proposals beyond use solutions in a space project.

Syllabus

COMPUTATIONAL DESIGN / CONTEMPORARY PARADIGMS

We will undertake an analysis of different buildings or contemporary constructions, which have been designed based on the strategies and tools similar to the ones studied on this postgraduate course. A case study will be done on one of the examples studied during the seminar and a subsequent critical assessment of the architectural results, comparing it with buildings conceptualised and constructed in a totally different way.

BIOMIMETICS / EMERGENCE IN NATURAL SYSTEMS

We focus on emerging systems, an important concept in material sciences, in biomimetic engineering, artificial intelligence, information theory and climate studies. The subject is subdivided into the blocks “patterns in nature”, “biomimetics / biomechanics” and “emerging systems”.

SOFTWARE FOR ADVANCED GEOMETRY WITH RHINOCEROS

This subject takes the shape of an instrumental workshop and aims to train students to use parametric software, a fundamental work tool for the study of design on the course and for the thesis. Because of the fact that the traditional CAD tools are based on geometric objects, a change in design requires changing all the components needed for readjusting the drawing. CAD/CAM/CAU software use a function known as “parametric”. A method that connects dimensions and variables to geometry in such a way that when the values change so does the part.

DIGITAL FABRICATION LABORATORY

The aim of the CAD CAM and Rapid Tools workshop is to give students the knowledge needed to fabricate or produce part of the material created during the course with digital fabrication tools. With CAD CAM tools we explore properties and results that are both visual and tectonic. We know that what is produced today with CAD CAM is certainly impressive, but we do not want to lose our critical capacity regarding some of these productions, which at times, from our point of view, are incomplete or superficial.

SOFTWARE FOR ADVANCED GEOMETRY WITH GRASSHOPPER

For designers that explore new forms through generational algorithms, Grasshopper is a graphic algorithm editor integrates very closely with Rhino's 3D modelling tools. Unlike Rhino Script, Grasshopper does not require a knowledge of programming or command sequences but allows designers to create simple to highly complex form generators. Through these digital tools, we establish our own language for creating form systems that become architectural and inhabitable spaces.

DESIGNING SYSTEMS THAT ADAPT TO THEIR ENVIRONMENT

On this subject, given in the form of a workshop, we learn to develop systems that act as structures capable of reacting in a living environment and adapting to it. In this way, it would be possible to envisage and design systems that feel, observe, listen, react, learn or interact. This design process implies learning to enable physical systems to communicate. We learn to use sensors, to take data on the environment, to process these using microcontrollers and to translate data processed in the actuators that form part of the active system.

FINAL POSTGRADUATE PROJECT. DESIGN, FABRICATION AND CONSTRUCTION OF THE FINAL COURSE PROTOTYPE

We decide together on the proposal that will have most potential for being developed as a life-size prototype and we will implement it, designing a small pavilion or prototype to put into practice the course's central research elements.

Lecturers

MIKE WEINSTOCK

Architect, head of studies at the Architectural Association. Director of the Emergent Technologies and Design programme at the Architectural Association. UK Director of technical studies at AA.

MARCO VERDE

Building engineer from the University of Cagliari. Biodigital Architecture MArch, Esarq UIC. Head of research at Hyperbody Research Group in TUDelft. Founder of the architecture and digital fabrication studio ALO.

ANNA PLA

Architect and designer with degrees from Elisava and the Architectural Association. Master at GSAPP, Columbia University. Professor of Advanced Design Studio at Upenn. Professor of Technical Studies at the Architectural Association.

PAU DE SOLÀ MORALES

Architect with a degree from ETSAB. Holds a PhD from Harvard Design School in Computational Design. Teaches Aesthetics and Composition at Rovira i Virgili University (URV). Director of the EINA school.

NATALIA ALONSO

Architect from Pontifical Xavierian University. Biodigital Architecture MArch Esarq UIC.

ANDRÉS DEJANON

Architect. Advanced Design and Digital Architecture MArch at Elisava. Master in Digital Arts from UPF. Specialised in Information Modelling and Visualization.

JUAN CRESPO

Doctor in Biomedical Engineering from the University of Barcelona (IBEC, CMRB), Master in Biomedical Engineering, UB-UPC (IBEC), Degree in Design at the UPC and Technical Engineering in Industrial Design at Elisava.

SYLVIA FELIPE

Architect at ETSAB. Distinction for Emergent Technologies and Design MArch at the Architectural Association of London. Founding partner of HYBRIDa. Teacher on the Design Degree at Elisava until 2018.

EVA MAGNISALI

Architect, teacher at the Architectural Association Robofab, Foster and Partners, tutor at the University of Wollongong, UoW.

MORE INFORMATION

→ elisava.net

Bold category members of Elisava Alumni Association enjoy a 15% reduction.

The teaching staff is likely to change according to reasons beyond the course programme. Elisava reserves the right to make changes in programming as well as the right to suspend the course two weeks before it starts if not reached the minimum number of participants, without further obligation of the amounts paid by each participant.

Master's and Postgraduate Degree programmes schedules can be expanded according to the selected course activities (weekends included).