

EXPARCH HOCHBAU/STUDIO COLLETTI

E3 2021/22

KM 0 ARCHITECTURE – GROW/PRINT YOUR OWN BUILDING



part of:

PROJECT FEA(S)T

[Furthering Experimental Architectures, Strategies and Technologies]

Part of the Institute for Experimental Architecture at the University of Innsbruck, operating since 2012, Studio Colletti operates at the crossroads of architectural design, building technologies and contemporary culture. Project FEA(S)T endeavours to further experimental architectures, strategies and technologies, to promote architecture as cultural production: a feat by an individual and/or a team – an achievement that requires great courage, skill, and strength – and a feast for the community and/or public – beautiful and enjoyable to experience.

Three research agendas lie at the core of the studio's mission statement, embedding old, current and future paradigms within a longer history of architectural design and theory, art and science, technology and philosophy:

Digital Poetics and Digital Production (understanding the past)

We have lost the 'r'. The digital *revolution* is something of the past, but we still believe in digital *evolution*. Based on two-and-a-half decades of Marjan's research into digital poetics, the studio explores how established digital thinking can advance the way we design and deliver more intelligent and eco-friendly buildings. References to past and present cultural phenomena complement a plethora of applied and experimental teaching methodologies. Students thereby acquire the skills to on the one hand critically reflect on their own production and the on-going discourse in architecture (technologies, aesthetics and environments), and on the other hand to gain a career advantage in leading architectural practices.

Postdigital and Neobaroque Practices (probing the present)

We are gaining the 'post' and the 'neo'. The challenges of understanding postdigital thinking as a continuation of the digital, and not its rejection, is paramount to the studio's teaching and research. With a simultaneous interest in the neobaroque *Zeitgeist*, we investigate architecture as a contemporary cultural practice. We teach students to encompass software and hardware advances in simulation and visualisation, VR and AR, in tandem with bespoke natural and artificial materials and industrial robotic fabrication (REX|LAB) and in conjunction with often overlooked analogue crafts, to awaken their accountability towards the common good of society and to develop their individuality and originality.

Hybrid and Transdisciplinary Environments (envisaging the future)

We shall 'trans'form. Architecture carries a huge responsibility in reprogramming the built and natural habitat. But it must evolve beyond its disciplinary canons and dogmas to respond to the acute problems and challenges of ecology, economy and sustainability. The studio works transdisciplinarily to prepare for the hyper-hybridity of the 4th Industrial Revolution, help provide adaptive and novel solutions in terms of form, program, materiality, energy, cities and environments and shape a more inclusive and participatory world, where design and beauty matter. Our students are taught how architecture is interfaced between technology and nature, and how transscalar it is, from micro (materiality, biotechnologies) to meso (prototypes, buildings) to macro (understanding cities, landscapes and ecosystems of the Alpine territory but not only).

E3 2021/22: Km 0 Architecture – Grow/Print your own Building

EP Entwerfen 3 (Prof. Dr. Marjan Colletti, Jan Contala, Philipp Schwaderer, Georg Grasser, NN)

*'The term km 0, or 0 km, was derived from the Slow Food movement. As a clear counterpoint to fast food chains, the idea of the movement is to promote the consumption of local ingredients, reducing the distance between producers and consumers. With this mission, it seeks to reduce damage to the environment caused by monoculture and the emissions of carbon dioxide / consumption of fossil fuels caused by the transportation of these products. In addition, Slow Food seeks to encourage the production and consumption of local and seasonal ingredients, maintaining regional customs and fostering a greater connection to and appreciation of the food.'*¹

Eduardo Souza

Km 0 Arch takes a similar approach, and endeavours to develop intelligent, innovative and impactful strategies to designing, manufacturing and building more ecologically friendly architectures. The E3 studio, entitled *Km 0 Architecture – Grow/Print your own Building*, aims at developing, together with students, healthy, economical, ecological and innovative buildings for the 21st century. Digital and physical models will be developed, in cooperation with the electives *Active Matter* and *Agile Models*.

In the E3 studio, students will investigate locally resourced natural materials, and develop novel ways to process them and render them suitable for innovative architectural approaches thanks to the possibilities of digital fabrication. We will observe how these materials change over time, how we as developers can control and design such change, and which application is most suitable on which scale. Students can choose which context they would like to work in (is it Tyrol, Malaysia, Africa...?), and consequently look for appropriate km 0 materials (is it clay, bamboo or salt...?).

After the material studies part, the focus will lay on Design for Manufacture methodologies. How can we develop design languages that suit the material and the fabrication? Are there differences in the design of a 3D printed product to a milled part? At this stage, students will produce 1:1 prototypes and test them under real conditions. After the semester, students will have worked on individual projects involving materials research as well as a completed prototypical design study. They will be ready to continue their studies on more complex design scenarios for the Bachelor project in the SS 2022.

¹ 'Zero Kilometer Materials: Preserving the Environment and Local Cultures', Eduardo Souza, <https://www.archdaily.com/958893/zero-kilometer-materials-preserving-the-environment-and-local-cultures#:~:text=The%20%20km%20architecture%20approach,the%20identity%20of%20their%20site.&text=Local%20materials%20like%20stone%2C%20earth,the%20weight%20of%20the%20building.>

Active Matter: A Transdisciplinary Approach

SE Vertiefter Entwurf: Hochbau (Tiziano Derme, NN)

Active Matter is a series of interdisciplinary courses organised between the Department of Architecture and the Department of Microbiology of the University of Innsbruck. The concept of Active Matter derives from the deep interest in a material-based research approach to explore potential bonds between microbial biotechnologies and advanced building technologies.

Within this context, the course will explore the relationship between time and design and the emergence of new materials (bio-composites), and Aesthetics related to imprecision, aging, and sustainability. This course introduces an intelligent design and manufacturing workflow based on Microbiology applied to the built environment. Students will be given an overview of the advanced manufacturing hardware and fundamentals of Microbiology through the lenses of an experimental material-based research approach. Students will learn how to develop an intelligent design and manufacturing workflow; Understand Computer-aided production procedures of related industries; Learn about Fundamentals of Microbiology; Learn geometric representations for digital manufacturing; Design and manufacture objects using advanced manufacturing; Apply principles of sustainable prototyping and digital fabrication within the context of Life Sciences; Understand performance-driven design workflow; Understand principles of generative design applied to fabrication.

Specifically, this semester is oriented to using Hydrogels based graded materials. Those materials have the potential to enhance the change in the materiality of Architecture and enable a passage from understanding materials as substrates that enhance life and metabolic cycles. Each student will develop together with the Department of Microbiology a specific workflow and a graded hydrogel shell prototype.

Agile Models: Data and Experience

SE Konzept und Methoden des Entwurfs (Mümün Keser)

Today, we live in an agile world and we have rapidly evolving imaging and modeling software at hand that allows us to easily recreate natural phenomena/environments artificially/digitally. In this way, these tools force us to rethink reality as such, allowing us to enhance and expand reality and even uncover the deeper meaning of an architectural project.

In the age of AI, virtuality and digitization, how will we as architects respond to these developments and new aspects of form finding?

As the name suggests, this seminar is about developing your projects and deepening the methods, conceptualisations and overall narratives in the digital field. The goal of the seminar is to develop ideas or methods based on modeling and documenting a design process in such a way that you gather values and principles, which you can apply to your studio design project. We will learn to work more flexibly and create workflows that can help us in any situation and fit the project into a rapidly changing environment. Furthermore this seminar is an experimentation and testing ground for approaches that not only use data as the main source of design ideas, but also use them to further enhance the project itself.

At the end, students will be able to handle integrative design and planning tasks. They are able to independently and reflectively formulate an architectural concept and put it into contemporary discourse. They gather specific methodological knowledge and skills for the integration of aesthetic, functional, programmatic, urban planning, typological, technical and ecological aspects into the architectural design.

Teaching: in German and English, hybrid (online and in person)