

ioud

ioud - Institute of Urban Design

EM2 825155:>> Resilient Habitat Architecture<<

Climate Shelters and Collective Housing in Extreme Environments

UIBK Winter Semester 24-25

Instructors: José Carlos López Cervantes/ Cynthia Sánchez Morales

Course meetings: Wednesdays 9:00 am



©Studio Soqotra

Video presentation: <https://youtu.be/g8evBF1f4Lg>

This video was created using artificial intelligence, based on the narration of a utopian near future where cities are adapted to severe climate conditions.

CONTENT:

Course abstract:

This course focuses on the exploration of designing climate shelters integrated with collective housing in the context of extreme climate conditions. In a world facing significant challenges due to climate change, architecture has the responsibility to propose innovative and sustainable solutions.



©Studio Soqotra

In an era where climate change is rapidly altering environmental conditions, architecture must evolve to meet the demands of new, resilient habitats. This course, “Resilient Habitat Architecture”, delves into the critical role of contemporary design in creating sustainable living spaces that can withstand extreme weather conditions. Students will explore how architectural innovation can address the urgent need for adaptable, durable, and efficient habitats in environments ranging from deserts and polar regions to areas prone to floods, hurricanes, and other natural disasters.

The course will start with an examination of the pneumatic architecture of José Miguel de Prada Poole, particularly his "Instant City" project in Ibiza (1971), to investigate how inflatable and lightweight structures can serve as models for shelters in extreme environments. Through the lens of José Miguel de Prada Poole's visionary work in pneumatic architecture, students will learn to conceive and develop architectural solutions that not only provide shelter but also enhance communal living and sustainability. The course will emphasize the importance of integrating advanced materials, digital design tools, and generative AI in the creation of these habitats, pushing the boundaries of what is possible in modern architecture.



Prada Poole, "Instant city" , 1971 Ibiza.

The central project of the course will involve designing a climate shelter that also functions as collective housing in an extreme environment. Students will investigate how Prada Poole's approach to pneumatic architecture—inflatable and temporary structures—can inspire modern solutions for shelters that adapt quickly to changing and extreme environmental needs.

Emphasis will be placed on designing resilient habitats that are capable of withstanding the harshest conditions while providing a comfortable and sustainable living environment. Students will be challenged to innovate in the use of materials, energy efficiency, and space optimization, ensuring that their designs meet both functional and environmental demands.



©Studio Soqotra

Course methodology:

The course will develop through the following stages:

1. Research and Analysis: Students will begin with research on different types of extreme climates and how architecture has responded to these challenges, focusing on José Miguel de Prada Poole's projects like "Instant City."

2. Introduction to Pneumatic Architecture and Generative AI: Workshops will be conducted on the use of generative AI tools for exploring new architectural forms, and on pneumatic architecture as a model for adaptable and sustainable shelters.

3. Conceptual Design: Students will develop initial proposals through sketches, digital models, and simulations, exploring inflatable and lightweight structures inspired by Prada Poole's work.

4. Project Development: Using digital modeling software, students will refine their preliminary designs, considering aspects such as mobility, sustainability, energy efficiency, and collective habitability.

5. Final Presentation and Critique: The projects will be presented and discussed in a final forum, evaluating both the innovation in design and the technical feasibility of the proposals.

This course will be an Advanced Architectural Design studio which examines the connection between conceptual understanding of design and form generation through digital design techniques. Essential knowledge will be acquired by software modeling and critical current discourse on the discipline. Students will be instructed in theory and simultaneously they will be equipped with digital techniques of design and representation.

Our premise is that Architecture is a formal discipline and based on that statement the course will be divided in three blocks. Each of them will last four weeks and it will contain theory and a design task. These three design tasks will reflect over three main levels of understanding: conceptual, procedural and practical; each of them connected to a canonical concept of our discipline.

During the semester, the students will be working on these design blocks:

- BLOCK 1. CONCEPTUAL KNOWLEDGE. ABSTRACTING MORPHOLOGIES. A TOPOLOGICAL PROBLEM

Students will formulate associative arguments using Artificial intelligent as a design tool. A critical analysis of the result is expected because this transdisciplinary approach will have to formulate new formal conditions, new coherencies and new formal aesthetics in architecture.

- BLOCK 2. PROCEDURAL KNOWLEDGE. CREATING A NEW URBAN TISSUE. AI as a speculative tool.

Students will have to do research to identify and model architectural conditions. There will be a problem of abstraction vs literality; how much abstraction is needed in order to read the different morphologies as geometries without reducing too much their specific qualities.

- BLOCK 3. PRACTICAL KNOWLEDGE. THE DEFINITION OF SEMANTICS.

From conceptual to disciplinary objects. Students will investigate on the qualities that give meaning to the diagrammatic design such as materiality and contextual conditions. The implementation of a system into an urban scenario of shelter plus collective housing.

Course Structure & Organization

Students will work individually. Each session will contain a theoretical lesson, deskcrits and specific software tutorials needed for developing the project. Progress will be reviewed weekly at the studio.

NEEDS:

Material Requirements:

Students need to bring their own laptops. Software will be accessible through educational licenses.

Tools and Techniques:

In order to apply this specific methodology, students will be instructed in specific software. No previous experience on the software will be required.

Final Deliverables & Requirements & Assessment (OLAT):

Complete graphic description of the project is expected, including visualizations, drawings, diagrams, research material, and any kind of visual information that support the entire comprehension of it.

SUBMISSION

Grading Procedures:

Grades are determined based on the quality of work produced, progress and improvement over the course of the semester, completion of project requirements, quality of participation, attendance, attitude, and ethical conduct. Grading policies will be discussed during the first weeks of the studio, and any questions regarding grades or policies should be directed to the instructors. A passing grade in the course requires committed completion of all projects, including the institute archive in proper formats. Incomplete work will not be evaluated until the submission is completed. A failing grade is given whenever cumulative work, final work,

and/or attendance are unsatisfactory. It is also given when a student fails to submit a final project or fails to take a final examination without prior approval from the instructor.

Academic Integrity:

The integrity of the work of individuals is first and foremost a grading milestone. Student work that delivers the ideas or words of others as the student's own adversely impacts the whole faculty. Academic dishonesty, including cheating, plagiarism, commissioning academic work by others, or performing academic work on behalf of another student, is strictly prohibited and would result in a negative grade.

Plagiarism:

This includes but is not limited to; copying words, images, or other material from a source without using appropriate citation rules such as quotation marks, footnotes, references, or other indications of the original source, paraphrasing another person's ideas in your own words without crediting the original source, taking sole credit for assignments without giving credit to those who worked with you, submitting work for a course that has already/also been submitted for another course or internet plagiarism, such as submitting work either found or paid for online, failing to cite any internet sources used, or cutting and pasting sentences from various websites to create a collage of uncited words.

Incomplete Work & Extension of time:

A student may receive a negative grade or no grade when the work is incomplete at the evaluation date by the end of the semester. By requesting permission from the instructor in good time prior to the date of the final examination or presentation, this can be avoided. Permission will be granted only under extraordinary circumstances and usually for medical reasons, requiring a medical document proving the situation. Incompleteness must be fulfilled to the instructor's satisfaction no later than two weeks after the end of the term.

Archiving:

Students are required to submit physical examples of their work or digital examples no later than one week after the end of the term to their instructors or administration for archiving. This is a chance for students to have their work displayed or exhibited online and potentially featured in future institute publications or research projects. The instructors will provide a document titled the Einwilligungsformular that allows the institute to keep track of the agreement; if you wish not to permit this archival material to be published, please contact the institute secretary in good time.

Learning Policy (Studios and Seminars):

Attendance is mandatory at critiques, pin-ups, and reviews. If you do not present your work regularly, you will not receive a passing grade for the course. Students must have all required work related to the course during course hours (not at another location or other time). Students should not use course time to leave school to procure materials, run errands, etc. All activities that require one to be away should be scheduled to occur outside of course hours. Leaving in the middle of or before the end of regularly scheduled course times will result in an absence unless discussed with the instructors. Grades will be determined by the quality of work produced, an improvement over the course of the semester, completion of project requirements, quality of participation, and attendance.

All electronic recordings, image captures/screenshots (during zoom meetings), or audio recordings are strictly prohibited unless agreed upon or discussed beforehand with the instructors and participants.

Bibliography and References

1. Prada Poole, José Miguel de. **La Arquitectura Neumática y Otros Ensayos**. Madrid: Fundación COAM, 2013.
2. Banham, Reyner. **The Architecture of the Well-Tempered Environment**. Chicago: University of Chicago Press, 1984.
3. Cook, Peter. **Archigram**. Princeton Architectural Press, 1999.
4. Kolarevic, Branko, and Ali Malkawi. **Performative Architecture: Beyond Instrumentality**. Routledge, 2005.
5. Diller, Elizabeth, and Ricardo Scofidio. **Flesh: Architectural Probes**. Princeton Architectural Press, 1994.
6. Fisac, Miguel. *Estructuras orgánicas y arquitectura*. Madrid: Ediciones La Moderna, 1965.
7. Banham, Reyner. *The Architecture of the Well-Tempered Environment*. Chicago: University of Chicago Press, 1984.
8. Hagan, Susannah. *Digitalia: Architecture and the Digital, the Environmental and the Avant-garde*. Routledge, 2008
9. Kolarevic, Branko, y Ali Malkawi. *Performative Architecture: Beyond Instrumentality*. Routledge, 2005.
10. Otto, Frei. *Finding Form: Towards an Architecture of the Minimal*. Stuttgart: Axel Menges, 1995.