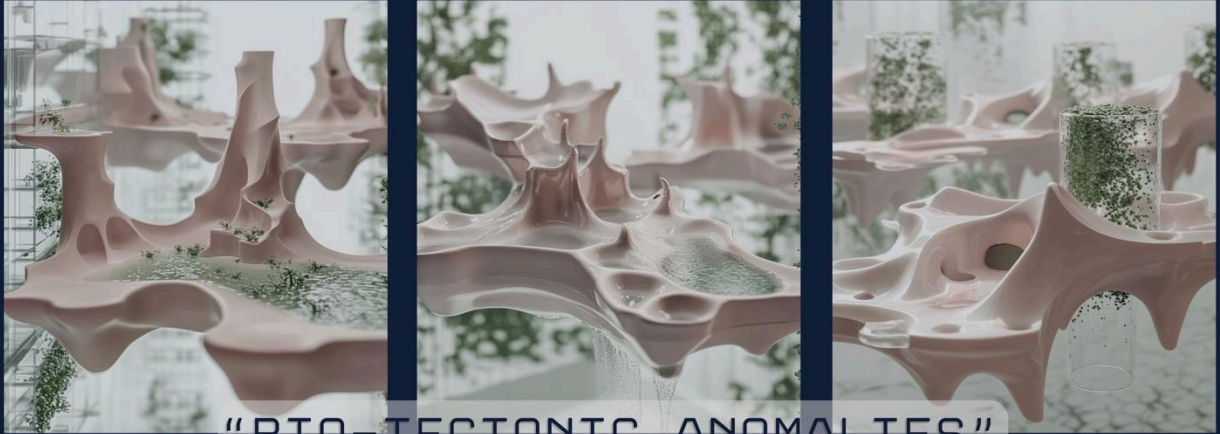




“BIO-TECTONIC ANOMALIES”

CHALLENGING TRADITIONAL METRICS OF ORIGINALITY

Responsive Ground Research Lab

Fitnat CİMŞİT KOŞ, Betül OZAR, Özgür KAVURMACIOĞLU, Zehra DELEREL, Seben AŞKIN KÜTÜKÇÜ

AIM AND SCOPE

In “Bio-Tectonic Anomalies” process, materials become more than passive substrates—they emerge as narrative agents, actively shaping design through experimental research. By dismantling conventional hierarchies of authorship, the module explores how bio-tectonic anomalies, organisms, and digital parametric tools co-create architectural exceptions, challenging established norms and redefining spatial logics. In the context of “Bio-tectonic Anomalies”, authorship transcends traditional notions of singularity, embracing a collective, process-oriented approach where materials play an active role in shaping design research narratives. This transformative perspective challenges conventional frameworks by shifting focus from the designer as the sole creator to a multidirectional and networked system that integrates biological, technological, and artificial elements. Normally, materials in design have been perceived as passive entities, shaped and controlled to achieve a designer’s vision. This perspective positioned the designer as the ultimate authority, with materials serving as mere instruments. However, emerging methodologies, such as those explored in Bio-tectonic Anomalies, redefine this dynamic. Materials are no longer static resources but active agents capable of influencing design trajectories, fostering collaboration with nature, and mediating between disciplines.

Participants will navigate this exploration through three progressive scenarios, each structured around a weekly theme as, “Material Disruptions – Unveiling Latent Intelligence”, “Algorithmic Speculation” -Reshaping Design Authorship” and “Bio-Crafting” – Transcalar Assemblies & Hybrid Manufacturing.

GOALS

By integrating biological and digital paradigms, “Bio-Tectonic Anomalies” proposes an alternative architectural language—one that subverts norms, redefines authorship, and embraces the radical potential of material agency. The module adopts a holistic approach to urban and ecological systems, aiming to examine how innovative production techniques shape both physical and digital environments (Figure 01). Participants will develop both individual and collective projects.

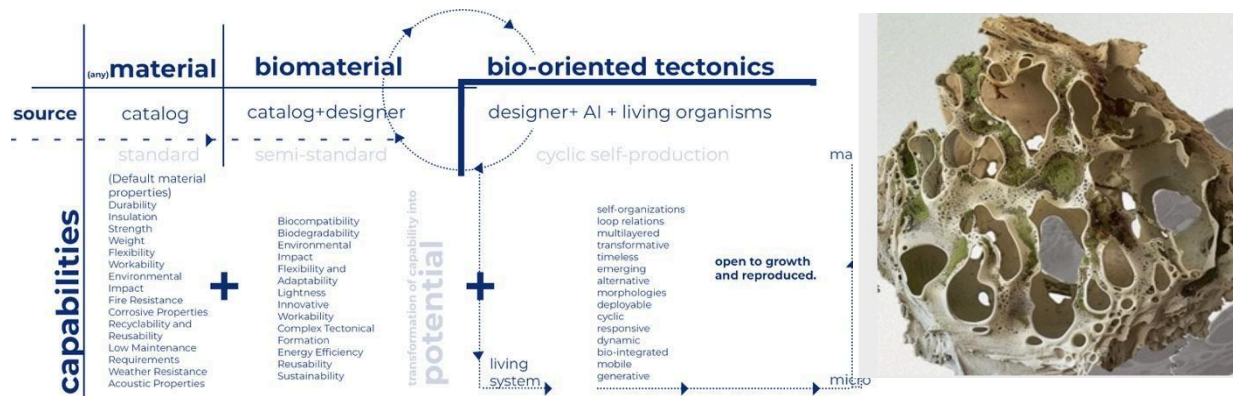


Figure 01. Diagram of a transcalar material framework progressing from standard materials to bio-oriented tectonics, illustrating a shift from fixed capabilities to adaptive potentials through the integration of living systems, designers, and AI within a regenerative, multi-scalar design logic.

SCHEDULE

Day 01: Material Disruptions – Unveiling Latent Intelligence

This phase redefines architectural surfaces as dynamic interfaces, where natural organisms and materials engage in unexpected interactions. Instead of treating materiality as a fixed condition, participants will document and analyze adaptive behaviors, revealing hidden symbiotic relationships. By positioning material agency at the core of design, this week challenges static representations, transforming architecture into an active negotiation between biological and built environments. Participants will conduct Tangible Mapping, a process of observing and documenting natural organisms' interactions with urban textures. By analyzing material behaviors, bio-responses, and adaptive growth patterns, this phase aims to challenge the static nature of architectural materials.

Key Notes:

- Investigating how biological organisms interact with physical surfaces,
- Observing material transformations, adaptability, and self-organization,
- Documenting biological and material agency through experimental mapping techniques.

Day 02-03: Algorithmic Speculation – Reshaping Design Authorship

This phase embraces fluid, evolving knowledge systems, where AI-driven tools—such as Runway, KreaAI, ChatGPT, Stable Diffusion, Comfy UI, Vizcom, and Midjourney—become partners in material evolution. Material behaviors are not just observed but computationally reinterpreted, unlocking latent design potentials through generative algorithms. By positioning materials as living archives, this process blurs the boundary between natural intelligence and digital computation, fostering a hybrid design approach where materials, organisms, and AI co-create speculative architectural exceptions. This week questions the role of authorship in design, moving beyond human-centric frameworks to explore AI as a collaborative agent.

Key Notes:

- Exploring AI-driven transformations of material and biological behaviors,
- Speculating on emergent architectural forms through generative design,
- Investigating new models of authorship beyond traditional design frameworks.

Day 04-05: Bio-Crafting – Transcalar Assemblies & Hybrid Manufacturing

This final phase challenges the tectonic conventions of architectural production, experimenting with elasticity, porosity, expansion, and adaptability to generate new material morphologies. Participants will engage in an iterative, data-driven process, integrating bio-tectonic intelligence and computational craft to construct transcalar modules that disrupt standardized architectural systems. Rather than treating materials as inert elements, bio-crafting repositions them as co-authors, actively shaping new architectural forms that exist beyond the constraints of conventional practice. In the final week, participants will apply insights from previous phases to develop bio-tectonic modules that resist architectural norms. Bio-Crafting will serve as a platform for constructing hybrid structures that blur disciplinary boundaries, integrating parametric adaptation and ecological intelligence to challenge the canon of architectural education.

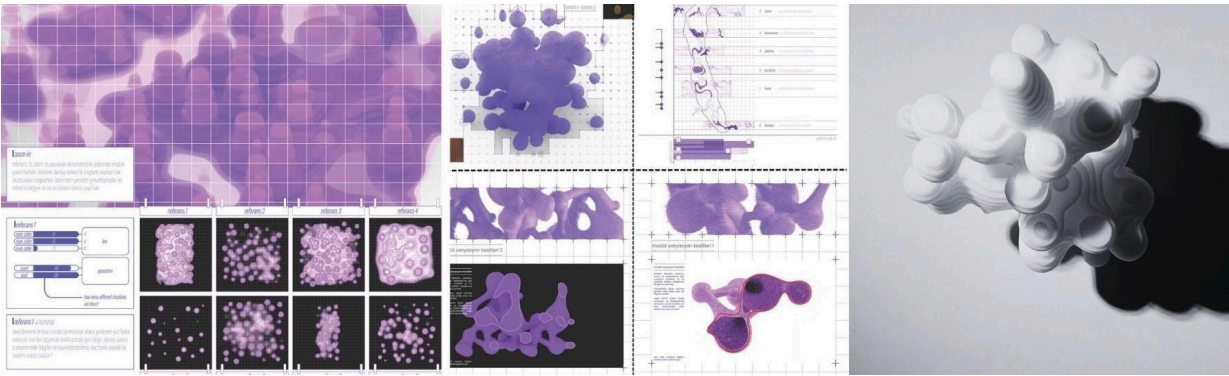
Key Notes:

- Developing hybrid material systems that integrate bio-tectonic elements,
- Constructing responsive modules across scales,
- Exploring advanced manufacturing techniques to materialize speculative architectures

Day 01:	Material Disruptions – Unveiling Latent Intelligence
Key Scenario:	"[RE-ACTOR] as Living Archives"
Key Question:	<i>How can material behaviors and biological intelligence redefine spatial systems?</i>
Seminars:	01. Bio-Tectonics & Hybrid Ecologies – Examining transcalar relationships between materials, ecosystems, and built environments. [INTRO] [Zehra Delerel-online] OK, FCK, BD, SAK DAY 1
Actions	- Bio-tectonic RE-ACTOR Field Studies – Material observations & bio-responsiveness documentation. - AI-Generated RE-ACTOR Material Patterns – Computational models interpreting biological adaptations. - RE-ACTOR Speculative Mapping Diagrams - Parametric explorations of material ecological dynamics
Day 02-03:	Algorithmic Speculation – Reshaping Design Authorship
Key Scenario:	"Co-Creating with AI, Organisms, and Data"
Key Question:	<i>How can AI-driven processes extend the evolutionary intelligence of materials?</i>

Seminars:	02. AI-Driven Material Speculation – Using machine learning to reveal hidden material potentials Beyond Formal Trends: The Critical Role of AI in Architecture – Exploring AI as a conceptual medium rather than a stylistic tool. [Betül Ozar] DAY 2 03. Synthetic Nature: Coding Biotic and Abiotic Interactions – Investigating algorithmic representations of material behavior. [Dzgür Kavurmacıoğlu] online DAY 3
Actions	- AI-Generated Bio-Simulations – Parametric design proposals using bio-data inputs. - Speculative Architectural Anomalies – Experimental prototypes challenging spatial norms. - RE-NAME-ACTOR
Day 04-06:	Bio-Crafting: Transcalar Assemblies & Hybrid Manufacturing
Key Scenario:	"Keep information Alive with Hybrid Prototyping"
Key Question:	<i>How can bio-tectonic design processes propose new architectural exceptions?</i>
Seminars:	05. Ecological Anomalies & Spatial Hybridization – Examining how biodiversity-driven architecture disrupts urban conventions. [Common Substrate] [Seben Aşkın Kütükçü] DAY 4 06. Speculative Prototyping: Transcalar Bio-Design – Exploring experimental methods for future spatial formations. [TransFauna] [Zehra Delerel] DAY 5
Actions	- Bio-Augmented Prototypes – Hybrid models integrating bio-materials and parametric logic. - Multi-Scalar Installations – A responsive, experimental architectural intervention.

FINAL OUTCOME: SPECULATIVE PROTOTYPES & BIO-TECTONIC MANUFACTURING



By the end of the module, participants will develop a series of experimental prototypes that challenge architectural norms through bio-tectonic adaptation and parametric strategies. These outcomes will merge digital fabrication, bio-integrated materials, and AI-driven simulations, resulting in a set of transcalar models that speculate on alternative architectural futures.

Manufacturing Details:

- **Hybrid Prototyping:** Participants will use a combination of digital and analog fabrication techniques, integrating robotic manufacturing, CNC milling, 3D printing, and manual bio-crafting.
- **Parametric Assemblies:** Through computational design and algorithmic scripting, participants will construct modular components that interact at different scales, forming responsive spatial systems.
- **Ecological Integration:** Prototypes will incorporate living organisms, bio-augmented textures, and material ecologies, redefining the relationship between architecture, urbanity, and nature.

Final Presentation & Critical Reflection

At the end of the module, participants will present their final speculative prototypes, demonstrate how bio-tectonic anomalies challenge and expand architectural conventions. The exhibition will showcase both digital and material experiments, framing them within a broader discussion on the future of architectural exceptions.



Team: Responsive Ground Research Lab

Assoc. Prof. Dr. Fitnat Cimsit Koş | Transcalar Design & Research Coordination

Assist Prof. Dr. Betül Ozar | AI-Driven Design & Generative Strategies

Dr. Özgür Kavurmacıoğlu | Parametric Design & Computational Methodologies

PhD Candidate Zehra Delerel | Bio-Tectonic Design & Material Intelligence

PhD Candidate Seben Aşkın Kütükçü | Participatory Design

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