Advanced Construction Methods

PLANT BASED MATERIALS

Arch507 W2022 3 Credits Thursdays 8:30-11:30am **Room 2222 and remote** Dipl.-Ing. Lars Gräbner

As the construction, maintenance and operation of the built environment undergoes significant changes based on demands in lower energy consumption, lower CO_2 emissions, and higher durability and long lasting quality, the building industry is delivering with innovative solutions in new construction methods and technologies. Consequently, the focus on sustainable design shifts increasingly towards the evaluation and thoughtful deployment of building materials and construction methods themselves.

Instead of continuing local building traditions, more opportunities arise to make use of new and emerging products and construction methods. Many of these technologies are already developed, but little known or scarcely implemented by a wider audience of architects, engineers and contractors.

This research seminar is a continuation of a series of initiatives to look closely at new and emerging advanced construction methods applicable for the North American market and to communicate their opportunities for the higher demands of responsible building construction. Furthermore, we will evaluate and research the potential for advanced and integrated environmental systems, and how alternative construction methods can create new opportunities for the design of buildings.

Each semester's course will concentrate on the vast opportunities and innovative applications of *specific material categories or specific construction methods.* During this semester, we will investigate **'plant based materials', which are materials from renewable and agricultural resources. Such building materials might be structural elements and from straw bale or bamboo, glulam and cross-laminated timber, or finish and facade materials made from bio-composites, cellulose, pulp, paper, bark and cork. We might investigate futuristic materials like mycelium masonry units and transparent wood or commonly known materials such as cotton, hemp, or solid wood and their respective applications and construction methods.**
The structure of the course will consist of self-directed and team-based research in teams of two, where literature, contact to the industry and research institutes as well as discussions and student presentations and workshops will play a major role. This seminar is not a lecture course.

Each student team is expected to deliver comprehensive communicational material in form of a compendium for architects, designers, engineers as well as for students. It is important that students are motivated for team efforts and independent research with weekly deliverables. ***It is expected that you are motivated to apply and excel in exceptional technical writing skills.***
This valuable material will be compiled over time and made available to a broad audience through a planned online publication.

prerequisite: Arch 417, graduate standing, hybrid in person and remote instruction