



Sustainable and Affordable Buildings

Arch 505

Instructor: Lars Junghans
Meeting time: Mo 8:30-11:30 AM (remote or 2108)

Course Description

In recent years, society has become increasingly aware of its responsibility to address the great challenges our society faces. The need to achieve carbon neutrality is one of the foremost among these; its importance in combating climate change can hardly be overstated. A second great challenge is ensuring that communities have sufficient affordable housing and buildings. Further, given the pressure that population places on natural resources, providing not just affordable but sustainable buildings has become a major goal as well.

Goal of the course is to find design strategies for sustainable and affordable buildings. A focus lies to find the right balance between (1) good architecture, (2) an optimized building envelope and (3) the technical effort for building operation to increase the comfort.

The course contains six design steps:

1. “Passive” sustainable design strategies
2. Detail planning in high performance buildings
3. Sustainable Materials and Embodied Energy
4. Cost effective solutions for affordable buildings
5. “Active” systems in high performance residential buildings (Building mechanical systems, HVAC)
6. Definition of renewable energy sources

Established international certification systems like the Passive House label, Minergie P and the Zero Net Emission Building Standard that are scrutinized on the energy flow of a building will be introduced and analyzed.

The course provides becoming architects the knowledge to design sustainable buildings in different climate zones. It gives an opportunity to learn how to contribute to a society that has a smaller impact to the environment.