

Composite Design: Advanced Materials in Architecture

Jefferson Ellinger: University of North Carolina Charlotte: SoA



ARCH 4050/5607/6050-D05, Spring R 2:00 - 4:45

jellinge@uncc.edu

Premise:

Advanced composite materials employing CNC technologies, historically the purview of high tech industries (e.g. automotive and aeronautical), is driving much innovation in architecture today, empowering architects with new form possibilities, sustainable fabrication methods and novel construction assemblies. This course will explore the use of advanced composite materials in architecture. Using GFRP (Glass Fiber Reinforced Plastic) as the material composite to be studied and worked with an architectural product will be designed, manufactured and tested. The use of advanced computation in design, testing and manufacturing will be used in producing the projects.

Objective:

Using computational design, analysis and manufacturing techniques:

- Acquire an understanding of the fundamentals for composite material design
- Acquire an understanding and ability in defining component design criteria
- Acquire ability to design mechanical connecting assembly for component
- Acquire an understanding and experience in producing a component of a composite material including:
 - Acquire knowledge and skills to design and build a mold for fabrication
 - Acquire knowledge of material and manufacturing assembly processes
 - Acquire knowledge experience in part finishing
- Acquire an understanding and ability in verifying design criteria in part through analytical evaluation

Method:

The semester will be an emersion into the process of designing, making, testing and exhibiting an architectural component built using advanced composite materials techniques. Working in teams, the semester will move in the sequence: material analysis, defining component design criteria, designing component, manufacturing mold, producing part, testing part and final exhibition.