

CEE 498: Theory and the Creation of Structures



Fall 2021, Monday / Wednesday, 10:00 am - 11:20 am
Civil Eng. Hydrosystems Lab | Room 3019

INSTRUCTORS: Prof. William F. Baker, Prof. X. Shelly Zhang
CREDITS: 3/4 CRN: 58133, 58134; CRN (ONL): 75724, 59099
PRE-REQUISITE: CEE 360, 470, one design course (e.g. CEE 460, 461)

This course introduces new structural concepts and principles related to the creation of novel geometries, structures, and modern systems. The course also aims to instruct ways for engineers and architects to approach practical design problems. New structural concepts and theories will be carefully applied to practical and real-world design projects globally.

Course topics include:

- Graphic statics and designing of forces;
- Maxwell Load path theorem;
- Michell trusses;
- Geometric stiffness and force density;
- Mechanisms and states of self-stress;
- Graphic kinematics;
- Form finding of trusses;
- Virtual work and energy sizing;
- Geometry of surfaces;
- Airy stress functions;
- Design of grid shells & cable nets;
- Tall building design.

