**Course Description**

Working from a basic understanding of material properties and assembly configurations: this course focuses on structural behavior including: stability, equilibrium, force flow, and force control. We investigate this via material form and assembly.

Lectures focus on the analytic techniques of measuring, mapping, and evaluating the flow of forces through a range of contemporary structural systems. We continue by applying metrics to determine appropriateness. Laboratories utilize direct material investigation to test stability and both local and higher order effects of forces. Our investigations provide an empirical understanding, a measure of appropriateness, and a basis for further computational analysis.

**Learning Objectives**

- Understanding of: stability, equilibrium, and force flow through material and assemblies
- A basic understanding of how force flows through material form, connections and assembly configurations (bulk, vector, and form-active)
- An understanding of internal force flow through components resisting gravity and lateral forces
- A basic ability to evaluate and determine appropriate structural systems, including configuration and component sizing
- Recognition of the importance of redundancy and ductility in structural systems
- Ability to test the physical properties of materials and assemblies and evaluate their potential for ordering systems.
- Ability to demonstrate the basic principles of structural systems and their ability to withstand vertical and lateral forces, as well as the selection of an appropriate structural system.

**Instructors**

Brendan Beazley  
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Teaching Assistant

We are available by email or by appointment. Please email in advance to set a time either before or after lecture (Tuesdays) or lab/discussion (Fridays).

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**This course meets the following NAAB Student Performance Criteria (SPC):**

CLASS MEETINGS

Lectures: Day: Tuesdays: Room: Timken (Lecture Hall)
MARCH 631-01 & 02: Timken, Tuesday 12:00 p.m. – 1:30 p.m. (Beazley & Ratchye)
ARCHT 331-01: Timken, Tuesday 12:00 p.m. – 1:30 p.m. (Beazley & Ratchye)

Lab/Discussion:
MARCH 631-01: E4 Friday 1:30 p.m. – 3:00 p.m. (Beazley)
MARCH 631-02: N5 Friday 11:45 a.m. – 1:15 p.m. (Ratchye)
ARCHT 331-02: E4 Friday 12:00 p.m. – 1:30 p.m. (Beazley)

TA’s Workshop: Thursdays: Room: Helzel Boardroom 12:00 p.m. – 1:00 p.m. (TAs)

COURSE WEBSITE:
The course website will contain updated information regarding both project and homework assignments as well as required and recommended readings/references please bookmark the following:
http://fluxus.cca.edu/~bbeazley/structures/

EXAMS AND ASSIGNMENTS:
Material presented in lecture will be supplemented by required readings. In addition to the readings, there will be projects, weekly quizzes, weekly homework, and a ‘midterm’ exam. Quizzes are closed book; however, 1 page of notes (front and back) is allowed. Quizzes must be completed in the first 15 minutes of lecture class or you will receive no credit. Missed quizzes due to an excused absence will not adversely impact your final quiz grade. Unexcused missed quiz is graded as a zero.

EVALUATION:
Attendance at lectures and lab/discussion is mandatory. Excused absences will not count toward an administrative fail; however, students are responsible for any missed work. More than one unexcused absence will impact your final grade, and three unexcused absences will result in an administrative fail. Computer/phone use, other than taking notes, during lecture and lab will result in an automatic absence for the day. Three lates shall accrue and count as one absence.

Final grades will be given based upon the following percentages:

Projects 45%
Weekly quizzes & homework on required readings and lectures 20%
Midterm exam on required readings & lectures 20%
Participation (this includes attendance) 15%

Late work will not be accepted.

COURSE MATERIALS:
8½” x11” paper having clean edges shall be utilized for all assignments. No staples—Yes paperclips, binder clips. Electronic calculator with sine, cosine, tangent, and square root functions.

iPhones/smartphones may NOT be used for the Midterm Exam—they are OK for homework and quizzes (in airplane mode w/ WiFi deactivated)

TEXTBOOKS:
***It is your responsibility to obtain a copy of this book***


(book out of print--see website)
REFERENCE TEXTS: