



**Texas A&M University**  
College of Architecture  
Spring 2010

**ARCH 327**

**Conceptual Structural Analysis**

**Instructor:** Shelley Holliday  
**Office:** Williams Building 008 E  
**Office Hours:** Tuesday-Thursday 2:00-3:00 pm  
Monday – Wednesday 10:00-11:00 am  
Open Door Policy, also by Appointment  
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**Course Description**

**A non-mathematical investigation of structural systems and components with respect to behavior; selection of the most appropriate structural system for various building typologies.**

**Course Prerequisite**

Junior or Senior classification.

**Course Goal**

To investigate and gain an understanding of the behavior of structures through a non-mathematical investigation. The goal is to excite students about structures and to enhance their design. Therefore, it will be taught at the appropriate level to accomplish this task.

**Learning Objectives**

- \* To be aware of appropriate structural elements and their relation to architectural form.
- \* To develop a non-mathematical understanding of fundamental structural theory and behavior.

**References**

Understanding Structures by Fuller Moore  
Form and Forces by Edward Allen and Waclaw Zalewski  
Building Structures Illustrated Ching, Onouye, and Zuberbuhler  
Structure in Architecture by Mario Salvadori with Robert Heller  
Why Buildings Stand Up by Mario Salvadori  
Why Buildings Fall Down by Mario Salvadori  
The Architect's Studio Companion by Edward Allen and Joseph Iano

**Grading**

Throughout this course you will be required to solve problems and answer questions that are based on the material presented in the lectures and text or notes in order to achieve our goal of being able to integrate structural systems into a building through good design. Specifically, your letter grade for the course will be determined based on homework assignments, exams, special project(s), attendance and participation.

Projects	50%
Homework (in class experiments)	20%
Final Project	20%
Attendance, Participation (must be in attendance to participate) and professional evaluation	10%

**Grades:**

A  $\geq$  .90%  
90% > B  $\geq$  .80%  
80% > C  $\geq$  .70%

70% > D ≥ 60%  
F < 60%

**A (Excellent)** Deliverables complete and submitted on time clearly identified, student's name, course number, and semester. The student's work is of exceptional quality and the solutions to the problems show a depth of understanding of the program requirements. The project is fully developed and presented well-both orally and graphically. The student has developed a strong and appropriate concept which clearly enhances the overall solution. Project demonstrates the result of insights learned from program, precedents, and context. Demonstrates a range of scales of inquiry from detail to component to an overall whole. Relevant to historical precedent play a meaningful part of your study. Alternatives demonstrate the development of a single train of thought across program, core, structure, and envelope. The work An "A" indicates that work is exceptional, beyond what was required. Perfect attendance, several "all nighters" and /or hard work do not however always constitutes an "A".

**B (Good)** Deliverables complete and submitted on time clearly identified, student's name, course number, and semester. The student's work shows above average understanding and clear potential. All program requirements are fulfilled and are clearly and concisely presented, both orally and graphically. Project demonstrates the result of insights learned from program, precedents, and context. Demonstrates a range of scales of inquiry from detail to component to an overall whole. Relevant to historical precedent play a meaningful part of your study. A "B" indicates the work is good and above average. It is more than what is required to satisfactorily complete the problem. Perfect attendance, several "all nighters" and/or hard work do not however always constitutes a "B".

**C (Fair)** Deliverables complete and submitted on time clearly identified, student's name, course number, and semester. The student's work meets minimum objectives of the course and solves major problem requirements. Project demonstrates the result of insights learned from program, precedents, and context. The work shows normal understanding and effort. The quality of the project as well as the development of knowledge and skill is average.

**D (Poor)** Deliverables complete and submitted on time clearly identified, student's name, course number, and semester. The student's work shows limited understanding and/or effort. Minimum problem requirements have not been met. The quality of the project or the performance, as well as development and skills is below average. It is possible to have perfect attendance, do several "all nighters" and work hard and still earn a "D" for the project or course.

**F (Failure)** The student's work is unresolved, incomplete and/or unclear. Minimum course objectives or project requirements are not met, and the student's work shows a lack of understanding and/or effort. The quality of project or performance is not acceptable or solving the problem.

### Tentative Schedule

<u>WEEK</u>	<u>DATE</u>	<u>TOPIC</u>
1	18 January	Nature
2	25 January	Concepts
3	1 February	Concepts
4	8 February	Bridges
5	15 February	Successes/Failures
6	22 February	Beams/Bending
7	1 March	Columns/Compression
8	8 March	Cantilevers
9	15 March	Spring Break
10	22 March	Tensile
11	29 March	Tensile
12	5 April	Connections
13	12 April	Connections
14	19 April	Project
15	26 April	Review

\*\*This schedule is subject to change at anytime throughout the semester.

Although this class is not listed as a design studio, it is being taught in a design studio environment, therefore all advantages of a studio are available.

#### **DEPARTMENT OF ARCHITECTURE / TEXAS A&M UNIVERSITY**

*The Studio Culture Statement is the official policy of the Department of Architecture at Texas A&M University and will be published widely and used to guide design studio pedagogy.*

#### **STUDIO CULTURE AT TEXAS A&M UNIVERSITY: A POLICY STATEMENT**

All students, faculty, administration and staff of the Department of Architecture at Texas A&M University are dedicated to the principle that the Design Studio is the central component of an effective education in architecture.

They are equally dedicated to the belief that students and faculty must lead balanced lives and use time wisely, including time outside the design studio, to gain from all aspects of a university education and world experiences. They also believe that design is the integration of many parts, that process is as important as product, and that the act of design and of professional practice is inherently interdisciplinary, requiring active and respectful collaboration with others.

*The Operational Procedures are intended to provide a framework for the successful development of an effective Studio Culture, both as a part of the academic program and as a model for future professional practice.*

#### **OPERATIONAL PROCEDURES**

Students and faculty in every design studio will embody the fundamental values of optimism, respect, sharing, engagement, and innovation. Every design studio will therefore encourage the rigorous exploration of ideas, diverse viewpoints, and the integration of all aspects of architecture (practical, theoretical, scientific, spiritual, and artistic), by providing a safe and supportive environment for thoughtful innovation. Every design studio will increase skills in professional communication, through drawing, modeling, writing and speaking.

Every design studio will, as part of the syllabus introduced at the start of each class, include a clear statement on time management, and recognition of the critical importance of academic and personal growth, inside and outside the studio environment. As such it will be expected that faculty members and students devote quality time to studio activities, while respecting the need to attend to the broad spectrum of the academic life.

Every design studio will establish opportunities for timely and effective review of both process and products. Studio reviews will include student and faculty peer review. Where external reviewers are introduced, the design studio instructor will ensure that the visitors are aware of the Studio Culture Statement and recognize that the design critique is an integral part of the learning experience.

The design studio will be recognized as place for open communication and movement, while respecting the needs of others, and of the facilities.

*The Dissemination and Oversight Procedures are intended to ensure that all students, and all faculty members, whether assigned to design studios or not, are aware of the Studio Culture Policy and work together productively to maximize the value of this component of the departmental pedagogy. Oversight suggests peer-review and mentoring at all levels, and presumes a positive role for those charged with administration, including the exploration of innovative teaching approaches, and opportunities to demonstrate collaboration both within the academy, with the design professions, and with the society we serve.*

#### **DISSEMINATION AND OVERSIGHT PROCEDURES**

The statement will also be posted on the department and AIAS websites.

The Department Design Caucus will initiate a formal discussion on the statement at the start of each academic year, with express purpose of ensuring that all new and returning faculty members understand and embrace its philosophies, and understand its opportunities.

The AIAS and the administration of the Department will ensure regular and open communication on all aspect of the academic program, including Studio Culture.

The Head of Department will include consideration of Studio Culture as part of the Annual Review of faculty members. This may suggest the use of peer review, encouragement of visiting critics, and recognition that productive review of the process and outcomes of design is not the exclusive domain of those assigned to teach design studios.

### **Academic Dishonesty**

Academic Integrity will follow the Aggie Honor Code.

**"An Aggie does not lie, cheat or steal, or tolerate those who do."**

Refer to the Honor Council Rules and Procedures

<http://www.tamu.edu/aggiehonor>

Each student will be asked to sign this statement for exams in this course:

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

It is the mission of the Aggie Honor System Office to serve as a centralized system established to respond fairly to academic violation of the honor code at Texas A&M University.

The Texas A&M University Student Rules provide the official definition of scholastic dishonesty and acts that are characterized as scholastically dishonest at:

<http://student-rules.tamu.edu/rule20.htm>.

### **Attendance:**

It is expected that the student will attend all classes. Attendance will be taken periodically. No **phantom** assignments will be accepted from those not in attendance. Excessive absence will result in a lowering of the final grade. See University Rules and Regulations.

The university views class attendance as an individual student responsibility. Students are expected to attend class and to complete all assignments. Instructors are expected to give adequate notice of the dates on which major tests will be given and assignments will be due. The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for absence. Students are advised to consult the University regulations for a list of authorized absences.

### **Special Considerations:**

The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Student with Disabilities (SSD) in Room B118 in Cain Hall or call 845-1637. <http://studentlife.tamu.edu/ssd/>

### ***A Teacher's Creed***

*"In the classroom on the first day of a new school year, I am eager to meet my students. I have rehearsed my greeting and first day's remarks, but no matter how many years I've prepared for this procedure, it's always new. My heart pumps a bit harder, faster; I feel adrenaline like an athlete, or like an actor, or maybe like a novice public speaker. It's a marvelous feeling, this first day, because I know that something special is going to happen, and I know it because I've experienced it before and I know that I will experience it every time I meet a new class throughout my venerable career. And then they're seated before me and I smile at this special feeling. This is an assembly of students, yes. But there's so much more, because each of these young persons is more than just a student entrusted to me. Each of these students has a story to tell, a lifetime; however brief, of experiences, a history of in volumes whose richness and depth I can barely begin to fathom. And so as I absorb the first glimpse of these young charges, I must appreciate the extent of my responsibility, of the privilege I've accepted in presenting these young souls my special knowledge. In offering them my talent and passion, I am adding an enormous array of new bright stars to the vast firmament of their minds, stars that will never have time to fade in their lifetimes. I will be part of their story. And I know that each of them will always be part of mine. And that's a good feeling, a feeling that is perpetually renewed, revisited, and rewritten in A Teacher's Creed."*