



Course title and number ARCH 631 – Applied Architectural Structures (section 600)
Term (e.g., Fall 200X) Fall 2013
Meeting times and location 9:35-10:50 am T,R in 208 Scoats Hall

Course Description and Prerequisites

Applied Architectural Structures. (3-0). Credit 3. Structural analysis of building structural systems: components, frames, shapes; selection and economics of structural systems; survey of current structural design codes; supervision practices in structural construction. Prerequisite: Graduate classification or approval of instructor.

Learning Outcomes or Course Objectives

- The student will develop a fundamental base and practical knowledge of the basic principles of structural behavior in withstanding gravity and lateral forces and the evolution, range, and appropriate application of contemporary structural systems.
- The student will be able to synthesize knowledge of components, systems and framing with environmental loads (particularly hazard) and design codes and standards.
- The student will be prepared in a direct way for the professional architectural registration exam in the structural systems topic.
- The student will be able to read a text or article about structural technology, identify the key concepts and related equations, and properly apply the concepts and equations to appropriate structural problems (**relevance**). The student will also be able to define the answers to key questions in the reading material. The student will be able to evaluate their own skills, or lack thereof, with respect to reading and comprehension of structural concepts, **clarity** of written communication, reasonable determination of **precision** in numerical data, and **accuracy** of computations.
- The student will be able to read a problem statement, interpret the structural wording in order to identify the concepts and select equations necessary to solve the problem presented (**significance**). The student will be able to identify common steps in solving structural problems regardless of the differences in the structural configuration and loads, and apply these steps in a clear and structured fashion (**logic**). The student will be able to draw representational structural models and diagrams, and express information provided by the figures in equation form. The student will compare the computational results in a design problem to the requirements and properly decide if the requirements have been met. The student will take the corrective action to meet the requirements.
- The student will create structural models with a computer application based on the concepts of the behavior and loading of the structural member or assemblage. The student will be able to interpret the modeling results and relate the results to the solution obtained by manual calculations
- The student will be able to articulate the physical phenomena, behavior and design criteria which influence structural space and form. (**depth**) The student will be able to identify the structural purpose, label, behavior, advantages and disadvantages, and interaction of various types of structural members and assemblies. (**breadth**) The student will be able to identify the configuration, label, behavior, advantages and disadvantages, and interaction of various types of structural members and assemblies with respect to materials (e.g. reinforced concrete beams or frames). The student will draw upon existing organizational and communication skills to clearly present concepts and personal interpretation of structural knowledge in writing assignments and examinations (**clarity, precision, accuracy, relevance, depth, breadth, logic, significance**).
- The student will interact and participate in group settings to facilitate peer-learning and teaching. In addition, the student will be able to evaluate the comprehension of concepts, clarity of communication of these concepts or calculations, and the precision and accuracy of the data used in the computations in the work of their peers. The student will participate in the classification and identification of structural components and assemblages and purposes with a case study chosen by a group in order to show synthesis of structural knowledge including modeling and analysis.

Instructor Information

Name Dr, Anne Nichols, Associate Professor of the Practice
Telephone number (979) 845-6540
Email address anichols@tamu.edu
Office hours 1-2:30 pm MW, 11 am-12 pm TR (*and by appointment*)
Office location A413 Langford

Textbook and/or Resource Material

Required Text:

- Structures, 7th ed., Daniel L. Schodek and Martin Bechthold, (2014) Pearson – Prentice Hall, ISBN 978-0-13-255913-3

Recommended Texts:

- A Structures Primer, Kaufman, (2010) Prentice Hall, ISBN 978-0-13-230256-3
- Understanding Structures, Moore, (1999) McGraw-Hill, ISBN 9780070432536
- The Structural Basis of Architecture, Sandaker, et.al, (2011) Routledge, ISBN 978-0415415477

References:

- AIA Publications
- Adoptable codes (ICBO, SBCCI, BOCA, CABO)
- International Building Code, International Residential Code
- Structural Design Codes (ACI, PCI, AISC, MSJC, etc.)
- Material and Professional Standard Documents (ANSI, ASCE, ASTM, ASHRAE)

Grading Policies

Students should refer to the Academic section in Student Rules and Regulations
<http://student-rules.tamu.edu>.

Assignments:

- Due as stated on the assignment statements.
- Only *one* assignment without University excuse may be turned in for credit no later than one week after the due date **and** before final exams begin. All other assignments will receive *no credit* if late without a recognized excuse or after final exams have begun.
- Calibrated peer review and term projects **cannot** be submitted late.

Team Project:

- A term project to be completed in teams is due the last week of class. Presentations of the projects will be made during class periods.

Mid-term Exams:

- Mid-term exams will be given in lecture at any time during the period. Make-up exams without an excuse will not be given.
- *Use of cell phones with a calculator application during exams is prohibited.*

Final Exam:

- The final exam will be comprehensive and is officially scheduled for **12:30-2:30 PM Friday, December 6.**

Teaching Assistant:

- Victoria Garcia (m2310_3@neo.tamu.edu)

Structures Help Desk:

- Miray Oktem (mrycan@neo.tamu.edu)
- ARCA129 845-6580 [Posted Hours](#) (link)

Other Resources:

- The Student Learning Center provides tutoring in math and physics. (<http://slc.tamu.edu/tutoring.shtml>) Other tutoring services are listed at <http://scs.tamu.edu/sites/default/files/tutoring.pdf> The Academic Success Center offers workshops at <http://us.tamu.edu/Undergraduate-Studies/Academic-Success-Center>

Grievances:

- For grievances other than those listed in Part III in Texas A&M University Student Rules: <http://student-rules.tamu.edu>/ the *instructor* must be the first point of contact.

Other Pertinent Grading Information (Rubric Included)

		Letter Grades (Approximate):	90-100..... A
Assignments	20%		80-89 B
Mid-term Exams	40%		70-79 C
Team Project	20%		60-69 D
Final Exam	20%		0-59 F

Attendance Policies

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at <http://student-rules.tamu.edu/rule07>

Project due dates will be provided in the project statements. Students should contact the instructor if work is turned in late due to an absence that is excused under the University's attendance policy. In such cases the instructor will either provide the student an opportunity to make up any quiz, exam or other graded activities or provide a satisfactory alternative to be completed within 30 calendar days from the last day of the absence. There will be no opportunity for students to make up work missed because of an unexcused absence.

Other Pertinent Attendance Information

Absences related to illness or injury must be documented according to <http://shs.tamu.edu/attendance.htm> including the Explanatory Statement for Absence from class for 3 days or less. Doctor visits not related to immediate illness or injury are not excused absences.

Lecture:

- The lecture slides should be viewed prior to class. Class will also require problem solving with the lecture examples, assignments, and case studies. The lecture slide handouts are available on the class web page and eCampus.
- *Use of electronic devices during lecture is prohibited.*

Notes:

- The notes and related handouts are available on the class web page at <http://faculty.arch.tamu.edu/anichols/631frame.html>, or on eCampus. A bound set can be purchased from the Notes-n-Quotes at 701 W. University, directly across from the Mitchell Physics Building in the Northgate Neighborhood.

eCampus:

- eCampus is the on-line course system useful for downloading files, uploading assignments, reading messages and replying, as well as posting scores; and is accessed with your neo account. This will be used to post class materials, questions and responses by class members and the instructor, and scores. It can be accessed at <http://ecampus.tamu.edu/>

Course Topics, Calendar of Activities, Major Assignment Dates

Tentative Schedule (*subject to change at any time throughout the semester*)

Note: Materials in the Class Note Set not specifically mentioned above are provided as references or aids.

Week	Topic	Required Reading/Problems
1	1. Structures: An Overview; Introduction to Structural Analysis and Design	Read*: Ch. 1 Solve: Assignment 1 (<i>start</i>)
	2. Review of Statics and Mechanics	Read: Ch. 2; note sets 2.1 & 2.2 Reference: <i>Appendices 1-5</i>
2	3. Overview of Building Codes	Read: Ch. 3; note sets 3.1 & 3.2 Reference: <i>note sets 3.3, 3.4 & 3.5</i>
	4. Overview of Design Philosophies and Beams	Read: § 6.1-6.4.1 & § 8.1-8.3 Reference: <i>Appendices 6-9; note set 4.2</i> Due: Assignment 1 over material from lectures 1-2

Week	Topic	Required Reading/Problems
3	5. Trusses & Columns	Read: Ch. 4 & § 7.1-7.4.2 Reference: <i>note set 5.1</i>
	6. Funicular Structures: Cables & Arches	Read: Ch. 5 Due: Assignment 2 over material from lectures 3-4
4	7. Rigid Frames: Analysis & Design	Read: Ch. 9; <i>note set 7.1</i> Reference: <i>note set 7.2</i> Due: CPR 1 Text over material from lecture 4
	8. Plates and Grids	Read: Ch. 10 & § 8.4; <i>note set 8.1</i> Due: Assignment 3 over material from lectures 5-6 & CPR 1 Reviews
5	9.	Mid-term Exam
	10. Reinforced Concrete Construction	Read: § 15.3, 6.4.4-6.4.7, 7.4.5 & 8.4.6, Appendix 12; <i>note set 10.1</i>
6	11. CASE STUDY – Reinforced Concrete	Read: <i>note set 11</i>
	12. CASE STUDY – Reinforced Concrete	Read: <i>note set 11</i> Due: Assignment 4 over material from lecture 7
7	13. Membrane, Net, and Shell Structures	Read: Ch. 11 & 12; <i>note set 13.1</i>
	14. Structural Planning & Design Issues	Read: Ch. 13, § 15.5 & 15.6; <i>note set 14</i> Due: Assignment 5 over material from lectures 7-8
8	15. Design for Lateral Loads Wind and Flood	Read: § 14.1; <i>note set 15.1</i> Re-read: § 1.3.1, 1.3.2, 3.3.3 Due: CPR 2 Text over material from lecture 10
	16. Design for Lateral Loads Seismic	Read: § 14.2; <i>note sets 16.1, 16.2 & 16.3</i> Re-read: § 3.3.4 Due: Assignment 6 over material from lectures 10-12 & CPR 2 Reviews
9	17. Structural Connections: Wood and Steel	Read: Ch. 16; <i>note set 17.1</i>
	18.	Mid-term Exam
10	19. Wood Construction	Read: § 15.2, 6.4.2, & 7.4.3; <i>note set 19.1</i>
	20. CASE STUDY – Wood	Read: <i>note set 20</i> Due: Assignment 7 over material from lectures 13-15
11	21. Steel Construction	Read: § 15.4, 6.4.3 & 7.4.4; <i>note set 21.1</i> Due: CPR 3 Text over material from lectures 15 & 17
	22. CASE STUDY – Steel	Read: <i>note set 22</i> Due: Assignment 8 over material from lectures 15-17 & CPR 3 reviews
12	23. Masonry Construction	Read: <i>note set 23.1</i>
	24. Foundations and Retaining Walls	Read: §15.7; <i>note sets 24.1 & 24.2</i> Due: Assignment 9 over material from lectures 19-22
13	25.	Mid-term Exam
	26. Project Presentations	
14	27. Project Presentations	
	Thanksgiving Break	
	28. Construction & Inspection; Review	Reference: <i>note set 28.1</i> Due: Assignment 10 over material from lectures 23-24 & Project Report

FINAL: **12:30-2:30 PM Friday, December 6**

Americans with Disabilities Act (ADA)

The Americans 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 Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>

Academic Integrity

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. *For additional information please visit:*

<http://aggiehonor.tamu.edu>

Care of Facilities

The use of spray paint or other surface-altering materials is not permitted in the Langford Complex, except in designated zones. Students who violate this rule will be liable for the expenses associated with repairing damaged building finishes and surfaces. At the end of the semester, your area must be clean of all trash.

Studio Policy (required of all studios)

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.

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.

Important Links Below

Department of Architecture Website	http://dept.arch.tamu.edu/
Department Financial Assistance	http://dept.arch.tamu.edu/financial-assistance/
Academic Calendar	http://admissions.tamu.edu/registrar/general/calendar.aspx
Final Exam Schedule Online	http://admissions.tamu.edu/registrar/general/finalschedule.aspx
On-Line Catalog	http://catalog.tamu.edu
Student Rules	http://student-rules.tamu.edu/
Aggie Honor System Office	http://aggiehonor.tamu.edu/
American Institute of Architecture website	http://www.aia.org/index.htm

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
AUGUST	18	19	20	21	22	23 last day to register	24
	25 freshman convocation	26 classes begin	27 Lect 1	28	29 Lect 2	30 last day to add academic convocation	31
SEPTEMBER	1	2	3 Lect 3	4	5 Lect 4 #1 due	6	7
	8	9	10 Lect 5	11	12 Lect 6 #2 due	13	14
	15	16	17 Lect 7 CPR 1 text due	18	19 Lect 8 #3 & CPR 1 rev. due	20	21
	22	23	24 Lect 9 Exam 1	25	26 Lect 10	27	28
	29	30	1 Lect 11	2	3 Lect 12 #4 due	4	5
OCTOBER	6	7	8 Lect 13	9	10 Lect 14 #5 due	11	12
	13	14 (mid-term grades due)	15 Lect 15 CPR 2 text due	16	17 Lect 16 #6 & CPR 2 rev. due	18	19
	20	21 college classes canceled for Symposium	22 Lect 17	23	24 Lect 18 Exam 2	25	26
	27	28	29 Lect 19	30	31 Lect 20 #7 due	1	2
NOVEMBER	3	4	5 Lect 21 CPR 3 text due	6	7 Lect 22 #8 & CPR 3 rev. due	8	9
	10	11	12 Lect 23	13	14 Lect 24 #9 due	15 last day to Q-drop	16
	17	18 Bonfire Remembrance day	19 Lect 25 Exam 3	20	21 Lect 26 presentations	22	23
	24	25	26 Lect 27 presentations	27	28	29 Thanksgiving Holiday	30
DECEMBER	1	2 (dead day) Friday classes	3 Lect 28 #10, project & evals due	4 Reading	5 Days	6 Final exams 12:30-2:30am 631 FINAL	7
	8	9	10	11	12	13 Commencement (and Saturday)	14
	15	16 Grades due	17	18	19	20	21
	22	23	24	25 Winter Holiday	26	27	28