ARCH 418: STRUCTURAL SYSTEMS III — FALL 2026

Ball State University
Department of Architecture

Time: **TR 11:00 PM - 12:15 PM**
Location: **AB 101**

Instructor: **Alan Dang**
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Office Hours: By Appointment

CATALOG DESCRIPTION:
Continuation of Structural Systems 2. Introduction to wood, concrete, and masonry systems and their application to design of horizontal and vertical building systems. Discussions of alternative structural building materials and systems.

Prerequisite: ARCH 318

Open only to students in the following programs: B.Arch., BA/BS in Architecture, or BA/BS in Environmental Design

OBJECTIVES:
- Design and analysis of structural elements of wood (beams, columns, beam-columns and connections)
- Design and analysis of structural elements of concrete (columns, beams, slabs, walls, foundations)
- Understanding effects of lateral loads on buildings (Wind and Seismic)
- Develop the ability to design components of small/medium scale structures and understand the applications of these same basic principles to large scale applications.

NAAB STUDENT CRITERIA:
- **SC.4 Technical Knowledge:** How the program ensures that students understand the established and emerging systems, technologies, and assemblies of building construction, and the methods and criteria architects use to assess those technologies against the design, economics, and performance objectives of projects.

GENERAL INFORMATION:

Textbook: *Structural Design, A Practical Guide for Architects* (Second edition) by Rod Underwood and Michele Chiuini

Link: Digital Copy

The Architect's Studio Companion: Rules of Thumb for Preliminary Design (Fifth Edition) by Edward Allen and Joseph Iano

Simplified Structural Analysis and Design for Architects (Third Edition) by Rima Taher

Recommended Texts:
National Design Specification for Wood Construction 2018 Edition
(Excerpts will be provided via Canvas for class use)

ACI 318-14 Building Code Requirements for Structural Concrete and Commentary

ASCE/SEI 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures Published by American Society of Civil Engineers

Course Materials: Textbook; Graph Paper (No Sketchbooks) (For Homework); Calculator (Not your Phone)

Attendance: Attendance is mandatory at all class meetings and will be considered in determining the final course grade. Excused absences will be at the Instructor's discretion and it will be the student's responsibility to make up course content on their own time.

NOTES WILL NOT BE PROVIDED WITHOUT DOCUMENTATION. If you miss class, you **MUST** get notes from another classmate.

EVALUATION:

Assignments: There will typically be one homework assignment per week. These will be posted on Canvas by the end of class and will be due as indicated on Canvas.

Homework will be checked for completion and correctness and receive points for each complete step in the problem. **PLEASE CIRCLE FINAL ANSWERS.**

A 'Resubmit' (R) will be given if a homework score is less than 7. All resubmissions are due within one week of return and have a maximum possible value of 7 out of the original 10. You may choose to accept the original, lower score.

All homework is to be submitted on Canvas. **Homework will NOT be accepted late.** If submitted to Canvas late, an automatic 10% deduction per day will be applied up to a 50% deduction max. **Special arrangements for late submission may be made in advance and up to instructor's discretion only.**

Late assignments will not be eligible for resubmission. Please upload as .pdf and as flat images. **If it is not legible, it will be marked incorrect.**

Duplicated file submissions will automatically be scored with a 0.

IF AI IS DETECTED IN HW SOLUTIONS YOU WILL RECEIVE A 0. This course content has been produced in a way to simplify complex engineering topics to basic algebra. References and tables provided have been simplified to make the content easier to use.

Course Notebook: A course notebook will be submitted at the end of the semester. This is required to be an 8 1/2" x 11", 3-ring binder organized with dividers and tabs including sections for daily record of class notes, homework, and structural design assignments. It is intended that this notebook will be a reference used in ARE preparation.

Sketchbooks will not be accepted.

Exams: All exams are open book and open note.

For all exams, 75% will be maintained as the minimum median score.

Irregularities regarding authorship on tests will result in automatic failure for the semester.

Project: In lieu of a final exam, a comprehensive semester project will be assigned later in the semester that will apply what you've learned in this course and all your previous structures courses.

GRADE DISTRIBUTION:

Exams	25%	A	93.30% +	C	73.30% - 76.69%
Homework	40%	A-	90.00% - 93.29%	C-	70.00% - 73.29%
Semester Project	30%	B+	86.70% - 89.99%	D+	66.70% - 69.99%
Course Notebook	5%	B	83.30% - 86.69%	D	63.30% - 66.69%
		B-	80.00% - 83.30%	D-	60.00% - 63.29%
		C+	76.70% - 79.99%	F	59.99% <

UNIVERSITY STATEMENT
We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse.

DISABILITY STATEMENT
If you need course adaptations or accommodations because of a disability, please contact the instructor of record as soon as possible. Ball State's Disability Services Office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or dsd@bsu.edu.