ARCH 318: STRUCTURAL SYSTEMS 2 FALL 2026

Ball State University
Department of Architecture

Time: **TR 12:30 PM - 01:45 PM**
Location: **AB 100**

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

CATALOG DESCRIPTION:
Direct application of loads to structural systems and design of framing plans. Discussion of strength of materials related to steel and concrete systems. Design of steel members subject to tension, compression, bending, and shear. Design of concrete members subject to bending and shear, and general concepts of concrete as a structural material.

Prerequisite: ARCH 218.

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

OBJECTIVES:
- Apply concepts from ARCH 218: Structural Systems 1 to understand forces and their behaviors affect the sizing of members in a structural system.
- Understand and apply categories of loads as well as stress and strain equations to analyze and understand force behavior and resistance properties.
- Design and analysis of structural elements of steel (beams, columns, and connections)
- Understanding effects of lateral loads on buildings (Wind and Seismic)
- Develop the ability to design components of small/medium scale steel 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

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

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

Recommended Texts:
Steel Construction Manual, 16th Edition. The American Institute of Steel Construction
(Excerpts will be provided via Canvas for class use)

ACI 318-25 Building Code Requirements for Structural Concrete and Commentary

ASCE/SEI 7-22 Minimum Design Loads and Associated Criteria for Buildings and Other Structures Published by American Society of Civil Engineers

Course Materials: Textbook; Graph Paper (For Homework); Calculator (Not your phone)
References posted on Canvas for in-class use
Previous ARCH 218 Notes and handouts for reference

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:

Assignment:

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 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 in the correct orientation. **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 final exam. 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, quizzes, structural design assignments and structural project documentation. It is intended that this notebook will be a reference used in subsequent structures courses.

Sketchbooks will not be accepted.

Exams:

The Final Exam is comprehensive and will address all content covered throughout the semester. 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:

A semester project will be assigned that encourages you to discover, consider, and demonstrate the relationship of structural behaviors, paths of forces, and performance of a composite body towards addressing these factors within architectural design. More information will be given to you in class.

GRADE DISTRIBUTION:

Exams	30%
Homework	30%
Final Exam	20%
Structural System Project	15%
Course Notebook	5%

A	93.30% +	C	73.30% - 76.69%
A-	90.00% - 93.29%	C-	70.00% - 73.29%
B+	86.70% - 89.99%	D+	66.70% - 69.99%
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.