

CEEEES 60274: Advanced Reinforced Concrete Design
Instructor: Luis B. Fargier-Gabaldon, PhD, PE
Offered in the Spring

Instructor's Contact Information

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Course Information

CEEEES 60274

Schedule: T, Th, 11:00-12:15

Course Description

Design, behavior and detailing of Reinforced Concrete (RC) members under flexure, shear and axial loads; including foundations, disturbed regions and beam-column joints. Design of two-way RC and Post-tensioned (PT) slabs. Introduction to seismic design of RC structures.

Week Topic

1-2 Design of RC footings
3-4 Strut and tie models
5-6 Design of two-way RC slabs
7-8 Yield line analysis of slabs
9-11 Design of one-way PT slabs
12-13 Design of two-way PT slabs
14 Detailing of RC members
15-16 Seismic design of RC members

Course Learning Objectives

By the end of this course students will be able to:

Design footings, disturbed regions, two-way RC and PT slabs, and beams and columns to resist earthquake-induced demands.

Prerequisites

Undergraduate course on reinforced concrete design

Undergraduate course on analysis of indeterminate structures.

Required Texts:**Recommended Texts:**

ACI CODE-318-19: Building Code Requirements for Structural Concrete and Commentary.

Reinforced Concrete: Mechanics and Design, 8th Edition. by James K. Wight. Pearson, 2021.

Expectations

Come to class alert and well-rested every time. Take an active role in interpreting the lecture and images presented. Ask pertinent questions. Take notes but be careful taking notes, you may miss a key part of the lesson if you are looking at what you are writing. Understanding a process through drawings or animation is often more important than a few words on paper.

Assignments

There will be approximately 6 assignments in this class.

Grading Scale

Grades are weighted and averaged on the 4.0 scale. Grades are established per the standards published in the Undergraduate Academic Code as follows:

- A 95% - 100%: Truly exceptional work, meets or exceeds the highest expectations of the course.
- A- 90% - 94%: Outstanding, superior work in all areas of the course.
- B+ 87% - 89%: Very good, superior work in most areas of the course.
- B 83% - 86%: Good, solid work across the board.
- B- 80% - 82%: More than acceptable, but falls short of solid work.
- C+ 77% - 79%: Acceptable, meets all the basic requirements and standards for the course
- C 73% - 76%: Acceptable, meets most of the basic requirements and standards in several areas
- C- 70% - 72%: While acceptable, work falls short of meeting basic standards in several areas
- D 60% - 69%: Minimally passing work, just over the threshold of acceptability
- F Below 60%: Failing, unacceptable work

Grading Policy

Midterm...30%

Final..... 30%

HW.....30%

Class participation...10%

If devices other than approved calculators are found in use during an exam, the student will be required to leave the exam. Late arrival or absence from the exam without proof of a serious mishap or emergency cause will result in exclusion from the exam. Ample time should always be allowed to arrive promptly at the start of the exam. (This policy was recommended by University officials in charge of enforcing honor code issues).

Attendance Policy

The attendance of every student is expected during every class in its entirety. Anyone requiring excused absences or early dismissals due to University activities is responsible for arranging such with his/her individual professor **in advance**. Notre Dame's policy concerning absence from class, in all but a few circumstances, accords to the student's professor the discretion to accept the excuse and permit make-up work. The exceptions to the policy include: personal illness verified by University Health Services (or another physician or the Center for Student Support and Care), death or major illness in the immediate family (or another individual as approved by Student Affairs), participation in off-campus legal proceedings that require a student's presence, a religious holy day, and official duties performed for the University as noted by Student Affairs, Academic Services for Student Athletes, ROTC, etc.

Students might be granted an excused absence by their instructor for a major family event, etc., but in order to be considered for such are expected to behave professionally and thereby, again, to discuss the absence **in advance** with their instructor.

All unexcused absences count against the comportment grade. Excessive unexcused absences will result in the reduction of a student's final overall grade by one increment for each absence after notification. If absences continue to be disruptive to the class, the student and Dean will be notified, per University policy, that any further absence will result in a failing grade.

Punctuality is expected. A student who is more than 15 minutes late—or who leaves early without approval—may be considered absent by the instructor.

Honor Code

Students at the University of Notre Dame are expected to hold a high ethical standard and abide by the University Honor Code, including the Honor Pledge: "As a member of the Notre Dame community, I will not participate in or tolerate academic dishonesty."

The Code of Honor and the Procedural Appendix are available at: <http://honorcode.nd.edu>

Diversity, Equity, and Inclusion

I am committed to and strive to maintain a positive learning environment based on open communication, mutual respect, and non-discrimination. In this class we will not discriminate on the basis of race, gender, sex, age, economic class, disability, veteran status, religion, sexual orientation, color, or national origin. Any suggestions as to how to further such a positive and open environment will be appreciated and given serious consideration.

Accessibility

It is the policy and practice of the University of Notre Dame to provide reasonable accommodations for students with properly documented disabilities. Students who have questions about Sara Bea Accessibility Services or who have, or think they may have, a disability are invited to contact Sara Bea Accessibility Services for a confidential discussion by emailing at sarabeacenter@nd.edu or by phone at 574-631-7157. Because the University's Academic Accommodations Processes generally require students to request accommodations well in advance of the dates when they are needed, students who believe they may need an

accommodation for this course are encouraged to contact Sara Bea Accessibility Services at their earliest opportunity. For additional information about Sara Bea Accessibility Services and to learn more about the student process for requesting accommodations, please visit Accessibility Support.

Support for Student Mental Health at Notre Dame

Care and Wellness Consultants provide support and resources to students who are experiencing stressful or difficult situations that may be interfering with academic progress. Through Care and Wellness Consultants, students can be referred to The University Counseling Center (for cost-free and confidential psychological and psychiatric services from licensed professionals), University Health Services (which provides primary care, psychiatric services, case management, and a pharmacy), and The McDonald Center for Student Well Being (for problems with sleep, stress, and substance use). Visit supportandcare.nd.edu.

Title IX Policy

The University of Notre Dame provides services for those who have been affected by sexual assault, sexual misconduct, dating or domestic violence, stalking and any conduct that creates a hostile environment. **For help and further information including contact information for on and off-campus resources**, please consult <https://titleix.nd.edu/support-resources/>.