

CES 4702 – ANALYSIS AND DESIGN OF REINFORCED CONCRETE – FALL 2020 – SECTION 1228 - ONLINE

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| Instructor | Dr. Kurtis Gurley, Professor in Civil and Coastal Engineering Weil 475, kgurl@ce.ufl.edu , (352) 294-7795 |
| Lecture Times | 3 rd and 4 th period (9:35 – 11:30), Tuesday and Thursday online (link can be found on Canvas) |
| Office Hours | 12:00 PM – 2:00 PM Tuesday and Thursday online. Other times by appointment |
| Grader/T.A. | A grader will help score homework but will not interface with students Dr. Gurley will score quizzes and hold office hours |
| Course Description | Ultimate strength analysis and design of reinforced concrete beams and columns, working stress design for flexure. |
| Course Objectives | Develop the ability of the student to determine the flexural and shear strength of existing reinforced concrete beams and columns, and to design reinforced concrete beams, one-way slabs, columns, and footings for given design loads. Develop the ability to compute deflections for reinforced concrete beams. Develop the ability to design reinforcement details for reinforced concrete structures. |
| Learning Outcomes | To teach the student to identify, formulate, and solve open-ended structural engineering problems. The course will also enhance the student's ability to use techniques, skills, and modern engineering tools necessary for the practicing structural engineer. |
| ABET-Related Objectives and Outcomes | This course achieves the following ABET-related objectives and outcomes: Outcome (a): Apply knowledge of mathematics, science and engineering Outcome (c): Design systems and components to meet desired needs |
| Prerequisites | CGN 3501 – Civil Engineering Materials, CES 3102 – Mechanics of Structures |
| Required Text | McCormac and Brown, <i>Design of Reinforced Concrete</i> , 10 th edition ISBN: 9781118879108 Wiley, see Canvas Files for access instructions |
| Student Attendance | Students are expected to show up on time and attend every class. |
| Homework Policy | Late homework will not be accepted. The layout and appearance of your work must be of professional quality. Please underline or box the answers and provide your name, the course number, the assignment number at the top of the first page. |
| Exam Policy | Make-up quizzes are not allowed. One of the quizzes will be dropped (see below). |
| Online Course Recording | Class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited. |
| Academic Honesty | UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class. |

- Grading** Six in-class, closed-book online quizzes will comprise 90% of the final grade. Six homework assignments submitted through Canvas will account for the remaining 10% of the final grade. Each quiz will be preceded by a homework assignment. The lowest scoring homework and quiz will be dropped. The purpose of this drop is to remove the need for make-up quizzes caused by unplanned or conflicting events, illness, etc. Quizzes are given during scheduled class time only. It is your responsibility to take the quiz. No make-up quizzes will be given.
- Quiz #6 drop exception: In order for quiz #6 to qualify as the dropped quiz, you must score at least 50% on quiz #6. For example, say your lowest score among the first five quizzes is 70%, and your score on quiz #6 is 45%. In this case the 70% would be dropped and the 45% retained. However, if your score on quiz #6 is 50%, the 50% will be dropped and the 70% retained.
- The final grade will be determined based a straight scale (A > 93, A- > 90, B+ > 87, B > 83, B- > 80, C+ > 77, C > 73, C- > 70, D+ > 67, D > 63, D- > 60). Grade thresholds may be adjusted downward based on class performance, but not upward. Thus the straight scale above is the most severe scenario (an A might move down to 92, but cannot move up from 93). After a quiz or homework is posted, you have ten (10) business days to discuss the grading with the instructor.
- For more information on grades and grading policies, please visit:
<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>
- Students Requiring Accommodations** Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.
- Software Use** All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.
- Calculator Policy for Quizzes** To prevent students from programming equations and problem solutions into their calculators for quizzes, or having their calculators communicate with other calculators or computers during quizzes, only certain models of calculators are permitted to be used during quizzes. These are the same calculators permitted for use in the Fundamentals of Engineering Examination (FE), which all Civil Engineering students will eventually need to take. There are **no exceptions**. No other models of calculators will be allowed in quizzes. The only acceptable models are those listed as follows:
- Casio:** All fx-115 models.
Hewlett Packard: The HP 33s and HP 35s models, but no others.
Texas Instruments: All TI-30X and TI-36X models.
- Cell phones** Cellular telephones are unacceptable during quiz time. Students **must** turn off their cell phones at the beginning of a quiz, and not turn it on again until they have submitted their quiz to the instructor and left the room. Any student doing anything with a phone during a test will be assumed to be communicating with another person and fail the quiz.
- Course Evaluation** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.a.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.a.ufl.edu/public-results/>.

Student Privacy There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources *Health and Wellness*

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or

<http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://care.dso.ufl.edu>.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Disclaimer

The syllabus and course material is subject to change. All changes will be announced in class and distributed. Students are responsible for all announced changes.

Notes: The topics and order are unlikely to change. However, the specific calendar days in the schedule are subject to change as the pace dictates. The quiz dates may change (with advance notice), but this is unlikely.

| Class | Date | Topic | HW due date |
|-------|------------------|--|-------------|
| 1 | Tu, September 1 | Course introduction, syllabus, materials, loads | |
| 2 | Th, September 3 | Review of critical material from previous classes | |
| 3 | Tu, September 8 | Flexure theory, fundamentals | |
| 4 | Th, September 10 | Strength analysis – singly reinforced beams (SRB) | |
| 5 | Tu, September 15 | Strength analysis – singly reinforced beams | |
| 6 | Th, September 17 | Quiz 1 (topic → Intro, review, SRB flexure theory) | HW#1 DUE |
| 7 | Tu, September 22 | Strength –T-beams, Doubly reinforced beams (DRB) | |
| 8 | Th, September 24 | Strength –T-beams, Doubly reinforced beams (DRB) | |
| 9 | Tu, September 29 | DRB, design tools for SRB | |
| 10 | Th, October 1 | Beam design – singly reinforced | |
| 11 | Tu, October 6 | Beam design – singly reinforced | |
| 12 | Th, October 8 | Quiz 2 (topic → Flexure & Strength – SRB, DRB, T-beams) | HW#2 DUE |
| 13 | Tu, October 13 | Design – doubly reinforced and T-beams | |
| 14 | Th, October 15 | Design – doubly reinforced and T-beams | |
| 15 | Tu, October 20 | Design – doubly reinforced and T-beams, stirrups | |
| 16 | Th, October 22 | Quiz 3 (topic → Design of single, double and T beams) | HW#3 DUE |
| 17 | Tu, October 27 | Shear and stirrups | |
| 18 | Th, October 29 | Shear and stirrups | |
| 19 | Tu, November 3 | Shear and stirrups, Bond and development | |
| 20 | Th, November 5 | Quiz 4 (topic → Shear and Stirrups) | HW#4 DUE |
| 21 | Tu, November 10 | Bond and Development, Deflections | |
| 22 | Th, November 12 | Deflections | |
| 23 | Tu, November 17 | Deflections, Columns | |
| 24 | Th, November 19 | Quiz 5 (topic → Bond and Development, Deflections) | HW #5 DUE |
| 25 | Tu, November 24 | Columns | |
| 26 | Th, November 26 | No Class Thanksgiving | |
| 27 | Tu, December 1 | Columns | |
| 28 | Th, December 3 | Columns | |
| 29 | Tu, December 8 | Quiz 6 (topic → Columns) | HW#6 DUE |

| Topic | Book Chapter |
|---|--------------|
| Introduction, material properties and behavior, design process, loads | 1, 4.1 |
| Flexure theory | 2 |
| Strength analysis – singly reinforced beams | 3 |
| Strength analysis – T beams and doubly reinforced beams | 5 |
| Design of singly reinforced sections | 4 |
| Design of T beams and doubly reinforced beams | 5 |
| Shear stress and stirrups | 8 |
| Bond and development | 7 |
| Deflections | 6 |
| Columns – introduction | 9 |
| Columns – design of short columns with bending | 10 |