

CE 3202-01 – Design of Concrete Structures
Instructor: Daniel Kuemmerle, PE
Course Syllabus – Spring 2021



KENNESAW STATE
UNIVERSITY

Course Description:

ACI design procedures for reinforced concrete beams, columns, footings, slabs and other members, Introductory to masonry design.

Course Goals:

- This course will provide you with the knowledge and experience to design concrete members using the provisions contained in the American Concrete Institute (ACI) 318, which is the basis for the design of most concrete members in the United States and many other countries.
- The “concrete members” mentioned above include beams, columns, footings, and walls.

Instructor:

Daniel Kuemmerle, PE

Email Address: dkuemmer@kennesaw.edu

Phone: 470-578-5079

Office Hours: Monday 12:30pm – 1:45pm, Tuesday 9:30am-12:00pm, Wednesday 12:30pm – 1:45pm

Office Location: online (please email me, call during office hours, or schedule a video chat with me in advance).

Class Time and Location:

Lecture: TR 3:30-4:45pm

Room: Q-314

Credit Hours:

3-0-3 (Lecture-Lab-Total Credit Hours)

Required or Elective:

This course is required for civil engineering majors. It is an elective for construction (elect either this course or CE 4103: Steel Design).

Textbook (Required):

Jack McCormac, Russell Brown: *Design of Reinforced Concrete, 10th edition, Wiley, 2015*

If purchasing the hardcover text: ISBN-13: 978-1-118-87910-8

If purchasing the electronic textbook: ISBN-13: 978-1-118-87893-4

Prerequisites:

CE 3201

This course requires a sound knowledge of the structural analysis—you must be able to analyze the forces and moments in a structure before you can design it.

Co-requisite:

None

Learning Outcomes:

Upon completion of this course, you will be able to:

1. Understand the design philosophy of reinforced concrete structures
2. Design singly and doubly reinforced concrete beams
3. Design for shear strength of beams
4. Design one-way reinforced concrete slabs
5. Determine deflections of reinforced concrete beams
6. Design reinforced concrete columns
7. Determine development lengths of straight bars in tension & compression
8. Design concrete footings
9. Apply the art of detailing different reinforced concrete elements

Course Outcome Measures and Assessment:

Measures and assessment of the outcomes will be made by:

- Periodic homework assignments.
- Periodic quizzes—during class and/or through *D2L Brightspace* (D2L).
- Midterm exams during the semester (see “Grading” for quantity of exams).
- A course project.
- One final exam.
- Course and instructor evaluation at the end of the semester to provide student feedback on the quality of the course and effectiveness of the instructor.

Grading:

Homework: 10%

Quizzes: 20%

Midterm exam 1: 20%

Midterm exam 2: 20%

Project: 10%

Final Exam (during finals week): 20%

The grade scale is: $A \geq 90.0\%$; $80.0\% \leq B < 90.0\%$; $70.0\% \leq C < 80.0\%$; $60.0\% \leq D < 70.0\%$; $F < 60.0\%$

Homework:

The goal of the homework is to give the student practice in larger scope engineering problems, and usually cover topics in their entirety. These longer problems prepare the student for “real world” engineering type problems, and are also modeled to be similar to the types of questions found in the midterm exams.

Unless specifically instructed otherwise, you are to submit all written work to the instructor in class in hard copy. Homework shall adhere to the following guidelines:

- Homework shall be scanned and submitted online in the appropriate folder.
- File Format: The submitted homework shall be one file of PDF format. If more than one page is needed, it must be a multi-page single file. The pages shall be in order. Uploading multiple separate files is not permitted.
- Page Orientation: The pages of the PDF all need to be able to be oriented so that the text can be read on screen. That means that all calculations should be read from the bottom of the page and text and numbers in diagrams should be read either from the bottom or the right of the page.
- Legibility/resolution: The document shall be legible and oriented properly. Be sure that it is of sufficient resolution that all writing can be read. Do not use “notebook paper” or other ruled paper, as it will make the work less legible. Using plain white “copier” paper or engineering paper is ideal.
- Neatness: The work shall be neat. All calculations shall be easily to read and shall “flow” so that the thought process of the solution is clear. Scratch outs are not allowed, so either use a handwriting table or use pencil on paper.

- Diagrams: Draw figures, free body diagrams (FBDs), and graphs where appropriate, including the problem statement diagram. Screen captures are allowed, but should be added to with appropriate given information. FBDs must clearly show the location of any cut. Any known values (magnitudes, dimensions, angles) shall be written directly on the figure where applicable.
- All problems must be clearly delineated by starting work on a new page.
- All answers must be boxed.
- In order to meet the submission requirements, I strongly encourage you to use a “scanner app” or a desktop scanner rather than taking pictures with your smartphone. “CamScanner” is a free app that has worked well for students in the past. However, there are dozens of free apps for most platforms.
- Units, where appropriate, should be written for the answer and in every step of each problem.

All students are expected to complete all assignments given. The homework is intended to give you the necessary exposure and experience for you to succeed in grasping a firm understanding of the course objectives. The instructor reserves the right to modify assignments as necessary. Work turned in late will not be graded/given credit except in approved cases of documented emergency.

Homework is usually returned within a week to give you feedback on your understanding of key concepts.

Quizzes:

There will be quizzes given throughout this course. They will be announced in advance, either in class or through D2L.

Midterm Exams:

The midterm exams are meant to assess your grasp of more in-depth, large-scale problems, and contain problems similar in size and scope to the assigned homework. Generally, the mid-term exams are not cumulative, but rather cover material delivered since the previous exam.

Tests will be closed books and notes with the exception on any reference material specifically allowed by the instructor.

Project:

There will be a concrete design project during the semester, where you will be asked to layout, analyze, design, and draft a concrete structure. 2D AutoCAD drawing will be required.

Final Exam:

The course final exam is a cumulative exam, covering all topics covered during the term. A clean, bound FE handbook (free of marks) can be used as a reference (as described above).

Unless directed otherwise, the final exam will be held during finals week in the usual classroom. Check the KSU registrar’s website for additional scheduling information. Similar to the midterm exams, the exam will be closed books and notes, with the exception that the FE Handbook may be used.

Email

Feel free to email me with questions or comments. Include your course and section number at the top of your email. If emailing about an assignment, be sure to include the assignment name you want help with, and the specific problem number(s). You must also include screenshots and your work completed to date. That way I can diagnose the issue as quickly as possible. Also, be sure to email me directly at dkuemmer@kennesaw.edu. Do NOT use the D2L email service, as that could significantly delay my reply due to email bounce backs.

Minimum Technology

The following is list of the minimum technology requirements you will need to succeed in this course:

- Computer access with internet: you will need access to the internet to stay current with both the D2L and *Modified Mastering Engineering* content in this course.
- You will need access to a document scanner to scan and submit paper homework assignments.
- You will need speakers or headphones connected to your computer for video content. In the event you are asked to submit video content, video and audio captured with a cell phone or webcam is sufficient.
- You will need your D2L “notifications” set to keep you current and up to speed on course content and announcements. Set your notifications in D2L by clicking your name in the upper right of the D2L page, and then selecting “notifications.”
- Web browser: your web browser will need to meet the minimum requirements needed to access content in D2L and *Modified Mastering Engineering*.

Lecture Topics:

- Introduction/Materials
- Flexural design of beams
- Shear design of beams
- Development and lap splice of reinforcement
- Serviceability: cracking and deflection of sections
- One-way slab system design (overview)
- Design of columns under combined loading
- Footing design

Important Dates:

1/15: Last day to drop/add classes

1/18: Holiday

3/8 - 3/14: Holiday

3/15: Last day to withdraw from courses without academic penalty

4/26: Last day to withdraw from courses with a WF

5/3: Last day of classes

5/10: 3:30-5:30 pm Final Exam

Policies:

- **Network Etiquette (“Netiquette”)**

Communication in an online class takes special consideration. Please read the short list of tips below.

- Be sensitive and reflective to what others are saying.
- Do not use all caps. It is the equivalent of screaming.
- Do not flame - These are outbursts of extreme emotion or opinion.
- Think before you hit the post (enter/reply) button. You can't take it back!
- Do not use offensive language.
- Use clear subject lines.
- Do not use abbreviations or acronyms unless the entire class knows them.
- Be forgiving. Anyone can make a mistake.
- Keep the dialog collegial and professional.

- **Class Attendance Policy:** Attendance is necessary for all class lectures unless you are ill or officially excused by the instructor (such as a result of official, documented participation in a university function). In the case of unavoidable absences, you are responsible for making up the work done in class. It is not the instructor's responsibility to provide the student with that information outside of class. It is the student's responsibility to obtain any missed information or handouts given in class from a classmate.
- **Make-up Policy (Assignments, Quizzes, Exams, etc.):** There will be no make-up work under any circumstances, except medical reasons and for pre-approved, official university functions. Provide your instructor with a letter from your medical doctor or KSU official. If your absence is excused, then the instructor reserves to have you either make up the work (homework, quizzes, exams, etc.), or to have subsequent work weighted more heavily to make up for the missing points.
- **Methods of Communicating:** D2L shall be considered the primary method of communication from the instructor, and you should check D2L regularly. You can ask questions and ask for clarification by e-mail or calling during my virtual office hours. If emailing me, please be sure to use my actual email address stated in my contact info at the beginning of the syllabus. Do not send D2L messages to me, as replies to this method usually bounce back.
- **Electronic Communications:** The University provides all KSU students with an "official" email account with the address "students.kennesaw.edu." Because of federal laws protecting educational information and other data (see the following section entitled "FERPA," this is the sole email account you should use to communicate with your instructor or other University officials.
- **Response Timeframe:** Grading of homework/assignments may take up to a week. I will try to respond to any discussions, comments, and questions within 24 hours Monday through Friday.
- **Grade Dispute/Appeal:** Final grade dispute/appeal must be submitted within a week of the final exam. The procedure has been outlined in the KSU website that can be accessed via the link at http://www.kennesaw.edu/registrar/policies/grade_appeals.php.
- **Readings, Preparation, and Participation:** The reading assignments, problems cases, and discussion forums are an integral element of the course. Students are expected to complete readings and other assigned work as well as take part in discussions. Learning is approached as a participatory process, which benefits from student/teacher and student/student interaction.
- **What is Plagiarism?** KSU defines Plagiarism as the practice of taking someone else's work or ideas and passing them off as one's own. When unaware or uncertain on how properly to cite a particular source, please do not neglect to add the citation — KSU considers not doing so as plagiarism. If you have questions on how to cite your work, please contact me immediately! For more information, please refer to the "Plagiarism Policy" under the *Policies* section of this syllabus.
- **Statement on Publication of Course Materials:** Some lecture slides, course notes, or assignments used in this course may be the property of the textbook publisher or other third parties. All other course material, including but not limited to slides developed by the instructor(s), the syllabus, assignments, course notes, course recordings (whether audio or video) and examinations or quizzes are the property of the University or of the individual instructor who developed them. Students are free to use this material for study and learning, and for discussion with others, including those who may not be in this class, unless the instructor imposes more stringent requirements. Republishing or redistributing this material, including uploading or linking the material it to web sites, violates the rights of the copyright holder and is prohibited. There are civil and criminal penalties for copyright violation. **Publishing or redistributing this material in a way that might give others an unfair advantage in this or future courses is may subject you to penalties for academic misconduct.**
- **Policy Changes:** Information contained in the course syllabus may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.

University Policies in response to Covid-19 (updated 8/7/2020)

Face Masks in the classroom

As mandated by the University System of Georgia, the university requires the use of face masks in the classroom and in KSU buildings to protect you, your classmates, and instructors. Per the University System of Georgia, anyone not using a face covering when required will be asked to wear one or must leave the area. Repeated refusal to comply with the requirement may result in discipline through the applicable conduct code.

Reasonable accommodations may be made for those who are unable to wear a face covering for documented health reasons. Please contact Student Disability Services at sds@kennesaw.edu for student accommodation requests.

Staying Home When Sick

If you are ill, please stay home and contact your health professional. Signs of illness include, but are not limited to, the following:

- Cough
- Fever of 100.4 or higher
- Runny nose or new sinus congestion
- Shortness of breath or difficulty breathing
- Chills
- Sore Throat
- New loss of taste and/or smell

Federal, BOR, & KSU Course Syllabus Policies:

Information contained in the links below constitutes the Federal, BOR, and KSU course syllabus policies and procedure. These policies are updated on the Academic Affairs Website annually.

- Academic Affairs - Federal, BOR, & KSU Policies <https://cia.kennesaw.edu/instructional-resources/syllabus-policy.php>
- Academic Affairs - KSU Student Resources for Syllabus <https://cia.kennesaw.edu/instructional-resources/syllabus-resources.php>
- **Academic Integrity Statement:** Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section 5c of the Student Code of Conduct addresses the university's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to university materials, misrepresentation/falsification of university records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the Department of Student Conduct and Academic Integrity (SCAI), which includes either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement.
- **Electronic Communication:** The University provides all KSU students with an "official" email account with the address "students.kennesaw.edu" or "kennesaw.view.usg.edu" (in D2L). As a result of federal laws protecting educational information and other data, this is the sole email account you should use to communicate with your instructor or other University officials.

Contacts to get Help:

- D2L Technical Support, go to <https://d2lhelp.view.usg.edu/> or call 678-915-HELP

- D2L Brightspace website at <https://kennesaw.view.usg.edu/d2l/login>
- KSU Help Desk Phone Number: (678) 915-HELP (4357).
- KSU Distance Learning at <http://distancelearning.kennesaw.edu/support/content-tools.php>
- KSU UITS at <http://uits.kennesaw.edu/>
- Accessibility policy of all technologies:
<https://softchalkcloud.com/lesson/serve/jV10GKPfztZwOn/html>
- Additional Resources
- Remote access to Library Resources at <http://www.kennesaw.edu/library/DI/dl.html>
- You can find The USG Copyright Policy at <http://www.usg.edu/copyright/>
- [Other help for student success at http://sss.kennesaw.edu/](http://sss.kennesaw.edu/)
- Academic support services and student services at (<http://kennesaw.edu/currentstudents.php>)
- KSU CETL Thank a Teacher at <http://cetl.kennesaw.edu/thank-a-teacher>
- The KSU Writing Center helps students in all majors improve their writing. Experienced, friendly writing assistants help with topic development, revision, research, documentation, grammar, and more. For more information or to make an appointment, visit writingcenter.kennesaw.edu or stop by English Building, Room 242 (Kennesaw campus) or Johnson Library, Room 121 (Marietta campus).