Properties, Design and Control of Concrete

CGN 6505
Class #: 18716 Section: TIA1
Class Periods: T Period 2-3 (8:30 AM – 10:25 AM) **Location**: WM 0202
R Period 3 (9:35 AM – 10:25 AM) **Location**: WEIM 1098
Academic Term: Spring 2025

Instructor:
Mang Tia
265M Weil Hall
tia@ce.ufl.edu
352-294-7768
Office Hours: M, W, F 10:45 AM – Noon **In-Person** or through **Zoom**

Teaching Assistants
Not Applicable

Course Description
Portland cement and aggregate properties relating to design, control, and performance of concrete. Concrete forming and construction methods. Laboratory testing and analysis.

Course Pre-Requisites / Co-Requisites
Course in introduction to civil engineering materials.

Course Objectives
To learn the "how" and "why" of the behavior, design, control, evaluation and construction practices of Portland cement concrete.

Materials and Supply Fees
Not applicable

Required Textbooks and Software

1. Lecture Notes for CGN 6505 by Mang Tia (to be downloaded from the course web page)

Recommended Materials

1. Book Title: Concrete Microstructure, Properties and Materials
   Authors: P. Kumar Mehta & Paulo J.M. Monteiro
   Publisher: McGraw-Hill Education; 4th edition (2014)
   ISBN-10: 0071797874   ISBN-13: 978-0071797870

2. Book Title: Design and Control of Concrete Mixtures
   Authors: Steven H. Kosmatka & Michelle L. Wilson
   Publisher: Portland Cement Association; 15th Edition (2011)
   ISBN: 0-89312-272-6

Course Schedule

Date	Lecture Topic	Readings
1/14	Introduction to Concrete	Ch. 1 of (1) & (2)
1/16	Aggregates	Ch. 7 of (1) & Ch. 6 of (2)

Date	Lecture Topic	Readings
1/21	Aggregates	
1/23	Portland Cement	Ch. 6 of (1) & Ch. 3 of (2)
1/28	Portland Cement	
1/30	Structure of Concrete	Ch. 2 of (1)
2/4	Strength of Concrete	Ch. 3 of (1)
2/6	Concrete at Early Age	Ch. 10 of (1)

2/11   TEST NO. 1 (2 hours)
2/13   Concrete at Early Age   Ch. 10 of (1)   **Topic for term paper due**

2/18 Hot & Cold Temperature Concreting Ch. 10 of (1)
2/20 Admixtures   Ch. 8 of (1) & Ch. 7 of (2)

2/25 Proportioning Concrete Mix   Ch. 9 of (1) & Ch. 12 of (2)
2/27 Stress-Strain Relationship   Ch. 4 of (1)

3/4   Shrinkage and Creep
3/6   Shrinkage and Creep

3/11   TEST NO. 2 (2 hours)
3/13   Sustainability of Concrete   **Outline for term paper due**

SPRING BREAK 3/17 - 3/21

3/25 Concrete Durability   Ch. 5 of (1)
3/27 Concrete Durability

4/1   Special Concretes   Ch.12 of (1) & Ch. 19 & 20 of (2)
4/3   Special Concretes

4/8   Concrete Mechanics   Ch. 13 of (1)
4/10   Special Topics

4/15   Test No. 3 (2 hours)
4/17   Student presentations

4/22   Student presentations

4/25 Term paper due

Student Presentation and Term Paper
Each student will be required to write a 10 to 20 page term paper on a topic related to concrete technology and to make a 20-minute presentation on the term paper.

Attendance Policy, Class Expectations, and Make-Up Policy
Students may attend class in person or through Zoom. Tests must be taken in person.
No make-up tests will be given except for medical reasons or unless arrangements have been made prior to tests.
A penalty of 10% per school day shall be assessed on materials turned in late. Excused absences must be consistent with university policies in the Graduate Catalog and require appropriate documentation. Additional information can be found here: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework (1)	5	5%
Tests (3)	75	75%
Presentation	10	10%
Term Paper	10	10%
	100	100%

Grading Policy

Percent	Grade	Grade Points
90.0 - 100.0	A	4.00
87.0 - 89.9	A-	3.67
84.0 - 86.9	B+	3.33
80.0 – 83.9	B	3.00
77.0 - 79.9	B-	2.67
74.0 - 76.9	C+	2.33
70.0 – 73.9	C	2.00
67.0 - 69.9	C-	1.67
64.0 - 66.9	D+	1.33
60.0 - 63.9	D	1.00
57.0 - 59.9	D-	0.67
0 - 56.9	E	0.00

More information on UF grading policy may be found at:
http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades
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.

Course Evaluation
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://gatorevals.aa.ufl.edu/. Evaluations are typically open during the last two or three weeks of

the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://gatorevals.aa.ufl.edu/.

University Honesty Policy

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://www.dso.ufl.edu/sccr/process/student-conduct-honor-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.

Software Use

All faculty, staff, and students 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.

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: http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html

Privacy issue with recorded materials:

Our 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.

Campus Resources:
Health and Wellness

U Matter, We Care:
If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

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 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://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

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