

# CGN 4905: Concrete Materials Science

## Fall 2018

### Instructor

Dr. Kyle A. Riding, 460C Weil Hall

**Email:** kyle.riding@essie.ufl.edu

**Office:** 352-294-1628

### Class Time and Place

MW | Period 3 & 4 (9:35 PM - 11:30 AM), MAEB 0229

### Office Hours

M, W, 11:45-2:00

### Prerequisites

CGN 3501C

### Learning Objectives and Outcomes

1. Describe concrete constituent material compositions and chemical reactions that give concrete strength
2. Design, prepare, and test concrete mixtures
3. Describe construction methods required for concrete strength and durability

### Textbooks

**Required:**

**PCA, Design and Control of Concrete Mixtures, 16<sup>th</sup> Edition**

### Homework & Exams

Late homework will not be accepted without **prior** arrangements with the instructor. Students are encouraged to work on homework in groups, but homework must be done individually. The standard for homework is that you must be able to explain what was done in the homework problem turned in and why. There will be 2 midterm exams and 1 final exam. The midterm exams will focus mainly on the material covered after the previous exam, however, because each class builds on previous material, students should be prepared to answer questions about any previously covered topic. Students are responsible for keeping returned homework, quizzes, and exams to be able to correct problems with recording of scores. In all cases involving grades, the student should wait at least 2 days after the problem is discovered (for a cooling off period) before talking to the instructor. All grades on exams, quizzes and homework becomes final 2 weeks after being returned to the class (a student not picking up an exam or homework does not constitute an extension to this deadline).

The class will have a design project that requires the students in groups to design and test a concrete mixture to meet specified performance criteria.

## Grading

Homework/Labs:	20%	Final Exam:	25%
Exam 1:	20%	Project:	15%
Exam 1:	20%		

### Grading Scale:

	Grade Greater Than or Equal To (%)	Grade Less Than (%)
A	93.4	100.0
A-	90.0	93.4
B+	86.7	90.0
B+	83.4	86.7
B-	80.0	83.4
C+	76.7	80.0
C+	73.4	76.7
C-	70.0	73.4
D+	66.7	70.0
D	63.4	66.7
D-	60.0	63.4
F	0.0	60.0

More information on grades and grading policies is here:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

## Class Attendance and Make-Up Policy

Class attendance is expected. Excused absences are consistent with university policies in the undergraduate catalog:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Unexcused absences require appropriate documentation. A makeup midterm and makeup final exam will be provided for students who miss either exam due to extreme, documented circumstances. Students should arrange with the instructor for makeup material, and the student will receive one week to prepare for any makeup assignment, if circumstances allow it.

## 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-conducthonor-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.

## Class Demeanor

Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

## Materials and Supplies Fees

There are no additional fees for this course.

## Class Communication & Email Policy

Email will be regarded as an official means of communication between the instructor and students. It is the responsibility of the student to ensure that the instructor has the student’s correct email address, and that it is checked by the student frequently.

## Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.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://evaluations.ufl.edu/results/>.

## Accommodation for Special Needs

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

## Counseling and Wellness Center

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

## Topics

- Portland Cement Production
- Cement chemical reactions
- Aggregates in concrete
- Concrete porosity and water penetrability
- Fresh concrete properties (workability, bleeding, etc.)
- Concrete strength
- Design of concrete mixtures
- Pervious concrete pavement design
- Supplementary cementitious materials
- Chemical admixtures
- Self-consolidating concrete
- Alternative cements
- Volume change
- Placing, finishing and curing concrete
- Test methods
- Durability
- Concrete sustainability