



# SACRAMENTO STATE

## Construction Management

### **Construction Management Program**

California State University, Sacramento

#### **CM 20**

#### **Construction Materials and Processes**

Course Syllabus

Spring 2009

Instructor: Professor Mikael Anderson, PE

Lectures: 12:00 – 12:50 PM Monday Wednesday – Sequoia Hall 456

Lab Section 1: 1:00- 3:50 PM Monday – Location TBD (Professor Reginato)

Lab Section 2: 1:00- 3:50 PM Wednesday – Location TBD (Professor Anderson)

Lab Section 3: 9:00- 11:50 AM Friday – Location TBD (Gareth Figgess)

Telephone: (916) 278-5990

CM Office: (916) 278-6616

Fax: (916) 278-7957

Email (**Best way to reach me**) – [anderson@ecs.csus.edu](mailto:anderson@ecs.csus.edu)

Office Hours: RVR 4019

Mon, Tues, Wed, & Thur 10:30 AM. – 11:30 AM

or by appointment

## CM 20 – Construction Materials and Processes

### COURSE DESCRIPTION:

Introduction to construction materials, to their properties in place in completed projects and to their characteristics that affect construction processes. The organizations, methods, equipment, and safety considerations that are common to projects of all types and to all segments of the industry. Field trips. **3 units.**

### PREREQUISITES:

The prerequisite courses for this class, which must have been completed with a C- or better grade, include CM 10 and ENGL 1A or equivalent. One hundred series CM courses are limited to students whose upper division standing has been approved by the Program Coordinator, or by special permission of the course instructor and the Program Coordinator.

### ACADEMIC HONESTY & GRADING SYSTEM:

All students are subject to the policies described in the University Catalogue. In particular, students should be familiar with policies described on pages 81–91, pages 98–106, and pages 328–331 of the 2008–2010 CSUS Catalogue.

Giving aid to a student during an exam or taking information from another student or student's exam constitutes academic dishonesty. Students caught cheating during an exam will receive a failing grade in the course and can be dismissed from the university. Students are encouraged to work together to solve homework problems, but **copying is obviously prohibited.**

Grades will be assigned based on the student's performance as measured by the assigned homework, midterm exams, and final exam. Grading shall be in accordance with the University's grading policy as outlined in the section entitled "Grading System" in the current copy of the University catalog.

#### **Grade Scale:**

A: 90–100      B: 80–89  
C: 70–79      D: 60–69  
F: <60

Field Trip Reports	20%
Independent Study	20%
Quizzes	10%
Midterm Exam #1	15%
Midterm Exam #2	15%
Final Exam	20%

\*Students achieving overall percentages as shown above are guaranteed grades as indicated. Actual cutoffs may be lower.

**COURSE OBJECTIVES:**

The purpose of this course is to introduce the student to:

- (1) The basic materials of construction (including background, sources, properties, and uses)
- (2) Construction methods and equipment
- (3) Construction terminology
- (4) MASTERFORMAT and UNIFORMAT project breakdown structures
- (5) The requirements and importance of safety
- (6) Construction industry information sources

It is also the purpose of this course to provide students with practice in analyzing information, conducting research and developing written and oral communication skills.

**SPECIFIC EDUCATIONAL OUTCOMES:**

At the conclusion of the class, students should be able to:

- Describe the nature of soils and the operations required in most earthwork
- List many of the materials commonly used in foundation, framing, cladding, glazing, roofing and finish systems in building construction projects
- List and describe the common foundation systems used in bridge and building construction
- Explain the advantages and disadvantages and proper application of cast-in-place reinforced concrete, pre-cast concrete elements, cast-in-place post tensioned concrete, masonry, structural steel, heavy timber, lightwood framing, light metal framing, and rammed earth.
- Identify the strengths and weaknesses of the roof covering systems for low-sloped and pitched roofs.
- Identify and describe several cladding and glazing systems and the environmental forces they are designed to resist.
- List and describe the basic mechanical and electrical systems used in construction projects.
- List and describe a variety of exterior and interior finish systems.
- Develop the ability to observe and record work processes.
- Identify and list the key participants and temporary requirements for a construction project

**TEXT:**

Edward Allen, Fundamentals of Building Construction, Materials and Methods, 4<sup>th</sup> edition, John Wiley & Sons, 2004

**REFERENCES:**

Principles and Practices of Heavy Construction, 2<sup>nd</sup> edition. Ronald C. Smith

Construction, 7<sup>th</sup> edition. Simmons and Olin

Construction Materials and Processes. Don A. Watson

Construction Safety Orders. State of California

## **COURSE ORGANIZATION & EVALUATION:**

### **Lecture & Lab Sessions**

Attendance is strongly recommended.

Lecture sessions will be fifty minutes in length, and held two times per week. Classes will be devoted to the presentation of lecture topics, a brief review of the assignments, administering exams, and addressing individual questions as time allows. To maximize learning, students are expected to complete all assigned reading or other research prior to each lecture and are encouraged to participate actively in lecture.

Quizzes will be administered at the start of Monday lectures. The quizzes will be closed book and closed notes. The quizzes will be short answer and cover the previous week's reading assignments.

Laboratory periods will focus on field trips to engineering projects under construction, or to manufacturing or fabrication plants. Students must provide their own transportation to the project site, which is typically within one-half hour drive of the University. Students must also provide their own hard soled footwear and University assigned hard hats, safety vests, and safety glasses. A written report is required the following Monday lecture session after each trip. You should be able to find at least one operation at each job site which can be improved upon. Written reports will not be accepted for those students that fail to physically attend the construction project jobsite.

In addition to the lecture and lab activities during the semester, each student will be required to conduct an independent study of a construction material not fully covered in the text, and approved in advance by the professor. Based on the study, a ten page written report will be submitted, and an oral presentation 10 minutes in length will be made to the lab section.

### **Course Web Page**

A CM 20 course web page will be developed through the CSUS SacCT. It is **important** for you to have a SacLink account to utilize the tools of this course web page. You will be expected to check your Saclink email and the course web page regularly (i.e., daily) for important class announcements, homework assignments & solutions, and other information. You must send all email to me during the semester with **“CM20”** **somewhere in the “subject line”**. Email without this designation will not be recognized or responded to (i.e., I will assume that it has not been submitted).

### **Classroom Interruptions**

The lecture sessions should be treated in a professional manner, as you would behave during a meeting with a client/contractor. All cellular phones and pagers to be turned off prior to entering lecture sessions and exams. Use of classroom computers during the lecture will also not be allowed. Any violation of these warnings will result in dismissal of the student from that day's lecture.

### **Exams Policy**

Two fifty minute midterm exams will be given as noted on the exam schedule below. These midterm exams will be returned for review in class, but will be collected and remained on file in the instructor's office for a minimum period of one year. Any appeal on the scoring of an exam must be made at the first lecture period following return of the midterm exam.

A two hour final exam will be given as determined by the University Final Exam Schedule (noted on the exam schedule below). Final exams will not be returned, but will remain on file in the instructor's office for a minimum period of one year. During this time, the student may schedule an appointment with the instructor to review his/her final exam.

#### **Exam Dates (tentative)**

Midterm Exam #1	Monday, March 2, 2009	(Week 6)
Midterm Exam #2	Monday, April 20, 2009	(Week 12)
Final Exam	Friday, May 22, 2009	10:15 a.m. – 12:15 p.m.

Students may bring one 8.5 x 11 sheets (both sides) to the first exam and an additional sheet for each subsequent exam. These sheets must be your own hand written notes. The instructor will collect and review these sheets. Makeup exams will be given only if *prior permission* is granted for extreme situations, such as valid medical reasons.

### **Evaluations**

Students are encouraged to provide constructive feedback to the instructor during the semester through "student representatives" and will also formally evaluate the instructor during the last week of class using the standard evaluation form.

## CM 20 - Course Outline (Tentative) Spring 2009

Week	Lecture	Topic	Reading Assignment
1	1	Introduction	Chapter 1
	2	Master Formats	<a href="http://www.csinet.org/s_csi/index.asp">www.csinet.org/s_csi/index.asp</a>
2	3	Foundations	Chapter 2
	4	Earthwork	Handouts
3	5	Cast-in-Place (CIP) Concrete	Chapter 13, 14
	6	<b>NO CLASS</b> – ASC Student Competition – Sparks, NV	
4	7	Cast-in-Place (CIP) Concrete	Chapter 13, 14
	8	Formwork	Chapter 13
5	9	Formwork	Chapter 13
	10	Tilt-up Concrete	Handouts
6	11	<b>MIDTERM EXAM #1</b>	
	12	Pre-cast Concrete	Chapter 15
7	13	Post Tension Concrete	Chapter 13
	14	Concrete Masonry Unit (CMU)	Chapter 9, 10
8	15	Structural Steel	Chapter 11
	16	Light Gauge Steel Framing	Chapter 12
9	17	Wood & Wood Products	Chapter 2
	18	Wood & Wood Products	Chapter 3
10	19	Heavy Timber Frames	Chapter 4
	20	Light Timber Frames	Chapter 5
11	21	Exterior Finishes	Chapter 6
	22	Interior Finishes	Chapter 7
12	23	<b>MIDTERM EXAM #2</b>	
	24	Roofing	Chapter 16
13	25	Glass & Glazing	Chapter 17, 18
	26	Cladding	Chapter 19, 20, 21
14	27	Interior Walls	Chapter 22, 23
	28	Finish Ceiling & Floors	Chapter 24
15	29	Mechanical Systems	Handouts
	30	Electrical Systems	Handouts

**A separate LABORATORY schedule will be issued in each laboratory section.**

\*\* Extent of coverage depends on time available

Note: Some sections that are starred (\*) in the book will be skipped.

### **DISCLAIMER:**

The instructor reserves the right to adjust the scope of the course, including number and timing of exams, as necessary.