UNIVERSITY OF CALIFORNIA — DEPARTMENT OF CIVIL & ENV. ENG
Spring Semester, 2021 — Professor: C.P. Ostertag

CE 60 PROPERTIES OF CIVIL ENGINEERING MATERIALS

COURSE OUTLINE

Date	Lectures	Reading Assignment
1. Jan 19	Introduction	
2. Jan. 21	Atomic Structure and Bonding	L.Notes
3. Jan. 26	Crystal Structures	CE 60 Chapters 3.1-3.10
4. Jan. 28	Mechanical Properties (Elastic vs. Plastic Behavior, Fracture)	CE 60 Chapters 6.2-6.6 Chapter 4.4.2
5. Feb. 2	Alloys and their Solid Solutions	CE 60 Chapters 4.3
6. Feb. 4	Phase Diagrams	CE 60 Chapters 8.0-8.7
7. Feb. 9	Equilibrium Microstructure Development	CE 60 Chapter 8.7
8. Feb. 11	Iron-Carbon Phase Diagram and Microstructures + Quiz #1	CE 60 Chapter 9.2
9. Feb. 16	Phase Transformations	CE 60 Chapter 4.1
10. Feb. 18	Heat Treatment of Plain-Carbon Steels	CE 60 Chapter 9.3
11. Feb. 23	Quenched and Tempered Steel	
Feb. 25	Summary + Quiz #2	
	E 47 Students join CE 60 Lectures and Labs	
12. Mar. 2	Introduction to Concrete	CSPM pp. 1-16
13. Mar. 4	Concrete Aggregates and their Properties	CSPM pp. 56-58; 253-258
14. Mar. 9	Proportioning of Concrete & ACI mix design	CSPM pp. 317-333
15. Mar. 11	Hydration of Portland Cement	CSPM pp. 203-228
16. Mar. 16	Structure of Concrete	CSPM pp. 21-35;41-43
17. Mar. 18	Quiz #3	
18. Mar. 30	Strength of Concrete	CSPM pp. 49-76
19. April 1	Elasticity and Failure of Concrete	CSPM pp. 85-95
20. April 6	Permeability of Concrete and Sulfate Attack	CSPM pp. 125-130
21. April 8	Durability, Frost Action, and Fire	CSPM pp. 130-152
22. April 13	Volume Changes & Creep of Concrete	CSPM pp. 95-109
23. April 15	Quiz #4	
24. April 20	Structure and Properties of Wood	L. Notes
25. April 22	Structure and Properties of Construction Steel	CE 60 Chapter 9.4
26. April 27	Strengthening Mechanisms of Construction Steel and Aluminum Alloys	CE 60 Chapters 9.5,6.7, 6.8
27. April 29	Summary	
May 13	**FINAL EXAMINATION (8am-11am)**	

L. Notes: refers to lecture notes which will be posted on bcourses
CE 60: refers to pages in Course book for CE 60 by McGraw-Hill (Foundation of Materials Science and Engineering); available in bookstores (isbn#9781121008120) and as e-book.
CSPM: refers to pages in Concrete, Microstructure, Properties and Materials by Mehta and Monteiro, 3rd edition. The book is available, free of charge: AccessEngineering: Concrete: Microstructure, Properties, and Materials

Grading Policy: Lab Grade: 20%; four Quizzes: 40%; Homework: 10%, and Final Examination: 30% of the Course Grade.