

E225 - EARTH MATERIALS SYLLABUS - FALL 2019

Lecture

Section 11856 11:15A-12:30P Tuesdays and Thursdays, Rm GY 245

Lab

Section 11857 1:00P-03:00P Thursday, Room GY 245

Section 11858 4:00-6:00P Thursday, Room GY 245

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Date	Subject	Reading
8/27	Atomic structure - basic principles	Chapters 1+4
8/29	The Periodic Table and atomic properties	Chapter 4
	<i>Laboratory: Introduction to Earth Materials</i>	Chapters 2+3
9/03	Formation of ions; bonding; coordination polyhedra	Chapter 4
9/05	Pauling's Rules	Chapter 4
	<i>Laboratory: Atomic periodicity and atomic structure; Coordination</i>	Chapter 4
9/10	Silicate structures; crystal systems	Chapter 4
9/12	Mineral compositions - representation	Chapter 4
	<i>Laboratory: Physical properties of minerals; non-silicate minerals</i>	Chapter 3
9/17	Exam 1 Review; Introduction to Geologic Environments	
9/19	Lecture Examination #1	Chapter 2
	<i>Laboratory: Silicate minerals</i>	Chapter 3
9/24	Igneous processes: plate tectonics and magma origin	Chapter 9
9/26	Igneous processes: compositions and compositional variations	Chapter 9
	<i>Laboratory: Mineralogy review; crystal systems; minerals in life</i>	Chapter 5
10/01	Igneous processes: crystallization of magma	Chapter 9
10/03	Igneous processes: numerical simulation of fractional crystallization In-class exercise	Chapter 9
	<i>Laboratory: Mafic igneous rocks</i>	Chapter 10
10/08	Igneous processes: basalts	Chapter 10

10/10	Igneous processes: subduction zones, water in magmas - andesites and granites	Chapter 9
	<i>Laboratory: Silicic igneous rocks</i>	Chapter 10
10/15	Igneous processes: minerals and review	Chapters 9+10
10/17	Sedimentary processes: weathering - chemical and biological controls	
	Laboratory Examination #1	
	<i>10/18 -10/20 Field Trip Southeast MO</i>	
10/22	Lecture Examination #2	Chapter 12
10/24	Sedimentary processes: transport and deposition of detrital sediments	Chapter 12
	<i>Laboratory: Siliciclastic sedimentary rocks</i>	Chapter 13
10/29	Sedimentary processes: compositional maturity of detrital sediments	Chapter 12
10/31	Sedimentary processes: chemical and biologic controls on rock formation - carbonates, evaporites, banded iron formations	Chapter 12
	<i>Laboratory: Carbonates, Evaporites and BIF</i>	Chapter 13
11/05	Sedimentary processes: In-class exercise	
11/07	Chemical sedimentary rocks	Chapter 12
	<i>Laboratory :Chemical weathering and hydrothermal minerals</i>	Chapter 16
11/12	Lecture Examination #3	
11/14	Metamorphic processes: Causes and types of metamorphism	Chapter 14
	<i>Laboratory: Metamorphism of shale</i>	Chapter 15
11/19	Metamorphic processes: textures and classification	Chapter 14
11/21	Metamorphic reactions: In-class exercise	Chapter 14
	<i>Laboratory: Metamorphism of basalt</i>	Chapter 15
11/23-11/30	Thanksgiving Break	
12/03	Surface processes: factors that control soil formation	website
12/05	Surface processes: identifying soil types and features	website

Laboratory Examination #2

12/10	Ore deposits - economic minerals	Chapters 16+17
12/12	Plate tectonics and the rock cycle <i>Laboratory: Liquid immiscibility and ore genesis</i>	
12/19	FINAL EXAM Thursday Dec. 19th FROM 12:30 P.M. –2:30 P.M.	

**Textbook is Earth Materials by C. Klein and A. Philpotts
Introduction to Mineralogy and Petrology**