

Geological Sciences 220 – Physical Processes in Geology

2009 Syllabus (Sem I)

Jan Tullis, Karen Fischer

DATE	LECTURE TOPIC	ASSIGNED READING Dynamic Earth (5 th ed)	EXERCISES, LABS, and FIELD TRIPS
Sept.	9 W	Outline of the course: studying the Earth	Ch. 1 (omit box 1.2)
	11 F	Overview of Earth's interior and plate tectonics	Ch. 2 (skim for now; we will re-read this chap. later)
	14 M	Earth materials: minerals & rocks	Ch. 3 (review 68-73) read 74-97
	16 W	Mass wasting; erosion, transport & deposition by running water	Ch. 13: 326-349 & Ch.14: 354-357 & 366-374
	18 F	Rivers: dams and floods	Ch. 14: 357-365 & 375-379
	21 M	Sedimentary rocks: shallow marine environments	Ch. 7: (esp. 182-190 & 195-199); Ch. 11: 277-283
	23 W	Sedimentary rocks: terrestrial environments & missing record	Ch. 11: 283-288
	25 F	Geologic time: relative & absolute	Ch. 11: 288-297 & 300
	28 M	Earth's internal heat	Ch. 2: review 37-41
	30 W	Volcanism	Ch. 5
Oct	2 F	Melting and crystallization of minerals and rocks	Ch. 4
	5 M	Origin of 3 magma types	(Ch. 4)
	7 W	Review	
	9 F	First Hour Exam	

Lab #1: Minerals & Rocks
Tues 3-5, 7-9; Weds 3-5, 7-9 PM
read Ch. 3 *before* lab

HW#1: Relative dating

HW #2: Stratigraphy

HW #1 due & Field Trip #1
Fri., Sat. & Sun. 1-5 PM

HW #3: Topographic maps

HW #2 due

(FT #1 rain date Sun. 1-5 PM)

HW #3 due

DATE	LECTURE TOPIC	ASSIGNED READING	EXERCISES, LABS, and FIELD TRIPS
Oct.	12 M Holiday		
	14 W Gravity anomalies & mass distribution; isostasy	Ch. 2: review 34-35; & handout	Lab. #2 - Topo Maps Tues 3-5, 7-9; Weds 3-5, 7-9 PM HW #4: Gravity
	16 F Fracture and flow of rocks	C h. 2: review box 2.1; Ch. 9: 225-232 & handout	HW #5: Geologic maps
	19 M Brittle vs. ductile deformation	Ch. 9: 232-245	
	21 W Metamorphism	Ch. 8	HW #5 due
	23 F Earthquakes & seismic waves	Ch. 10: 247-254, 259-260	Field Trip #2 Fri. 1 – 6 PM or Sat. 12 – 5 PM (rain date: Sun. 12 – 5 PM)
	26 M Seismic waves as probes into Earth's interior	Ch. 10: 266-272	HW #4 due HW #6: Seismic waves
	28 W Earthquake hazards	Ch. 10: 255-258, 261-266 & 274-275	
	30 F Earth's magnetic field & paleomagnetism	Ch. 20: 531-537 & Ch. 11: 297-299	
Nov	2 M Plate Motions	Ch. 2: review 41-57-- Ch. 20: 537-542	HM #6 due
	4 W Tectonics at plate boundaries		Lab. #3 - Geophysics Tues 3-5, 7-9; Wed 3-5, 7-9 PM
	6 F Mantle convection	Ch. 2: review 59-61 & Ch. 20: 544	
	9 M Mountain building processes	Ch. 12: 304-311; Ch. 20: 545-558	
	11 W Review		
	13 F Second hour exam		

	DATE	LECTURE TOPIC	ASSIGNED READING	EXERCISES, LABS, and FIELD TRIPS
Nov	16 M	Groundwater geology	Ch. 15: 383-395 & 401-407	
	18 W	Weathering, soils & deserts	Ch. 6: 148-170 Ch. 17: 450-467	
	20 F	Water resources & Ch. 17: 468-472	Ch. 1: Box 1.1; Ch. 15: 396-400	
	23 M	Earth resources	Ch. 21	
	25 W	<i>Optional discussion</i>		
	27 F	Thanksgiving Holiday		
	30 M	Atmospheric & oceanic circulation	Ch. 17: 447-450 Ch. 18: 475-481	
Dec	2 W	Ocean -continent interactions	Ch. 18: 481-506	Lab. #4 - Geol. Maps Tues 3-5, 7-9; Wed 3-5, 7-9 PM
	4 F	Flow of valley glaciers	Ch. 16: 411-431	
	7 M	Ice sheets and ice ages	Ch. 16: 431-434	
	9 W	Natural causes of climate change	Ch. 16: 434-442; Ch. 19	
	11 F	Human effects: from icehouse to greenhouse?		
	15	Tues 9 AM	Final Exam 9 AM – noon	(MM 115)