1-2002

GEOL 306.01: Igneous and Metamorphic Petrology

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Geology 306 Igneous and Metamorphic Petrology

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Lectures Tu, Th 9-10; Lab Th 10-12
Text: Raymond, "Petrology" 2002

Tentative date (lab days bold)	**Lecture and reading in text**	**Lab and reading in text**
Jan. 29	Equilibrium, phase diagrams relevant to basaltic magmas [p. 61-62, 66, 68-76]	
Jan. 31	(more on same)	Recognition of minerals in common rocks. Begin Igneous Structures [p. 8-19] and Textures [p. 15, 17-29, 40]
Feb. 5	(more on same)	
Feb. 7	Crystallization and melting; Influences causing melting or crystallization; Role of temp., pres., water, compos. [p. 88-93]	(complete Igneous Textures)
Feb. 12	Chemistry and chemical classifications of Igneous rocks [p. 33-38, 48-50, 54]	
Feb. 14	Review of plate tectonics and Igneous environments: spreading centers, subduction zones [p. 2-6, 88-91, 128, 662-665]	Mineral-based Classification of Igneous Rocks [p. 33-47, 52]; CIPW Norms [p. 670-676]
Feb. 19	(more on same … continental collision zones)	
Feb. 21	Plateau basalts, hotspots, and spreading ridges	Peridotite, serpentinite, density measurement, and calculation of % serpentinization [p. 642-644, 647].
Feb. 26	Ophiolites and peridotite [p. 161-165, 178.9-185.4; 642-656]	
Feb. 28	Gabbroic layered intrusions [p. 166-172.5, 174.9-179.5]	Gabbro, anorthosite, granophyre [p. 167, 170, 175-179, 666-667]
Mar. 5	Basalts: association, environments, minerals, chemistry [p. 83-88, 98-114.7, 120]	
Mar. 7	(more on basalts)	Basalt, diabase dikes
Mar. 12	Volcanic arc rocks: basalt, andesite, rhyolite [p. 114-118, 138-157]	
Mar. 14	Shallow granites, rhyolite ash flows [p. 128-135]	Andesite and rhyolite [p. 125-126, 138-140, 666-667]
Mar18-22	***===SPRING BREAK – NO CLASSES====***	**********
Mar. 26	Phase diagrams for granites [p. 78-81]	
Mar. 28	Deep granite batholiths [p. 193-220.5, 227]	Granites, granodiorite, diorite [p. 193-194, 197-205, 666-667]
Apr. 2	(more on deep granite batholiths)	
Apr. 4	Alkaline igneous rocks [p. 119, 236-254]	Alkaline igneous Rocks [p. 236-237, 251, 666-667]
Apr. 9	(more on alkaline igneous rocks)	
Apr. 11	8:-10: am ***LAB MIDTERM***	10-11:am Textures in metamorphic rocks [p. 479-484, 492-493]
Apr. 16	***MIDTERM ON LECTURES AND TEXT***	

Apr. 18	Metamorphic rock structures and tectonic environments [p. 468, 472-477, 479-485, 593diag., 662-665]	Pelitic (shale-composition) rocks [p. 490-492, 668-669]
Apr. 23	Metamorphic conditions: P, T, fluids, equilibrium, phase rule [p. 466-472.4, 493end-497, 508]	
Apr. 25	Metamorphic reactions and zones [p. 495end-501, 510-]	Mafic (basalt-composition) rocks [p. 490-492, 668-669]
Apr. 30	ACF, AFM diagrams [p.512-513, diags.p.512, 514, 526.]	
May 2	Metamorphic Facies [p. 497end-504] Petrogenetic grids and determination of pressure and temperature [p. 472, 496-502, 681-684]	Calc-silicate and quartzofeldspathic rocks [p. 490-492, 668-669]
May 7	Diffusion in metamorphism [p. 564.7-571]	
May 9	High-pressure [p. 577-582, 599top, 609-615]; Low-pressure contact [p. 520-530] facies, skarns [p. 536diag., 567-568diag.]	***FINAL LAB EXAM*** (comprehensive)

Term paper: Review some topic in Igneous or Metamorphic Petrology (e.g.: on a process or origin of a rock or association). **Form:** Typed, double spaced; at least 1-inch margins, no more than 5 pages excluding diagrams and list of references cited. List of references should be in same style as Geological Society of America Bulletin. **References:** >90% should be post-1994 and >80% from the professional literature (journals); use **Geo-Ref** to obtain most-recent references, and Science Citation Index. Web okay for some, encyclopedias <u>not</u> okay. *Check with me to okay tropic before proceeding.	**Paper grading:** Equally on **content**, including good reference list, and on **writing**. Rephrase everything in your own words; if you must use a phrase from the author, enclose that part in quotes. ***Course grade based on:*** 1st lecture midterm = 14% 2nd lecture midterm = 14% Lecture final = 20% Lab midterm = 17% Lab final = 23% Term paper = 12% **Total = 100%**

<u>Important dates:</u>

Jan. 30: Fee for late-registration begins.

Feb. 15: Last day to pay fees or drop/add or receive partial refund for classes dropped.

Mar. 11: Last day to drop classes (no refunds) or change grading option.

Mar. 18-21: Spring Break

May 13-17: Final Exam week:; **Final exam** 8:00-10:00am, Mon. May 13