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GEOL 306.01: Igneous and Metamorphic Petrology

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Geology 306 Igneous and Metamorphic Petrology
Lectures Tu, Th 9-10; Lab Th 10-12
Text: Raymond, "Petrology" 2002

Don Hyndman
office SC357

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)

<p>Term paper: Review some topic in Igneous or Metamorphic Petrology (e.g.: on a process or origin of a rock or association).</p> <p>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.</p> <p>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.</p> <p>*Check with me to okay topic before proceeding.</p>	<p>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.</p> <p>Course grade based on:</p> <p>1st lecture midterm = 14%</p> <p>2nd lecture midterm = 14%</p> <p>Lecture final = 20%</p> <p>Lab midterm = 17%</p> <p>Lab final = 23%</p> <p>Term paper = 12%</p> <p style="text-align: right;">Total = 100%</p>
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Important dates:

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*