

Instructor: Stephen A. Nelson, Room 302B, Dinwiddie
email: snelson@tulane.edu
Office Hours - MWF 8:30 AM - 4:00 PM

Laboratory Instructor: Erika Gonzalez

I. COURSE GOALS & OBJECTIVES

Since Rocks are the basic building blocks of the Earth, this course is designed to give the student a fundamental background in rocks, necessary to understand the Earth. The student will learn the principles behind rock forming processes and will learn to examine rocks in hand specimen and thin section, both as a means of identifying and describing the rocks and as a means of extracting clues to formulate hypotheses about how the rocks formed in nature.

II. TEXTBOOKS

Required Textbooks:

- *Petrology, Igneous, Sedimentary & Metamorphic 2nd Edition* by Blatt & Tracy W.H. Freeman & Co. 1995 (B&T)
- *An Introduction to the Rock Forming Minerals, 2nd Edition*, by Deer, Howie and Zussman (text used last semester in Mineralogy)

Supplementary Textbook:

- *Petrography, 2nd Edition* by H. Williams, F.J. Turner, and C.M. Gilbert: W.H. Freeman Co. (WTG) (Several Copies are available in the Lab)

Additional materials required for lab:

- (1) A handlens, available from the Tulane Bookstore
- (2) A double sided high density 3.5" floppy disk.
- (3) Rectilinear and Triangular graph paper.

III. COURSE GRADING

The course grade will be determined on the basis of the number of points scored out of a possible 1000 points. These points will be apportioned as follows:

Homework and Labs	15%
Lab Midterm	15%
Lab Final	20%
Lecture Midterm	20%
Lecture Final	25%
Field Trip Participation	5% (see below)

Attendance in class and lab is required (see Tulane University Undergraduate Catalog, p. 14) and is essential for you to get the most out of this course. Grades will be lowered as a result of excessive absence from either lecture or lab.

Field Trip: The Field Trip is scheduled for April 10, 11, 12 and 13 (Thursday through Sunday). Make plans now so you won't have any excuses for not attending. (No excuses will be accepted.)

IV. WEB PAGE

A Web site has been developed for this course. It includes course materials, including a copy of this syllabus, lecture notes, announcements from the instructor, and World-Wide-Web links. The site can be found on the World Wide Web at:

<http://www.tulane.edu/~sanelson/geol212/>

Be sure to check this web page regularly throughout the course for important announcements and updates.

V. TENTATIVE SCHEDULE OF LECTURES AND LABS

Date	Topic	Readings
Jan 9	Lecture: Textures & Structures of Igneous Rocks	B&T Introduction Chapters 1 & 2
	Lab: Textures of Igneous Rocks in Hand Specimen	B&T Chapter 2
Jan 14	Lecture: General Classification of Igneous Rocks	B&T Chapter 3
	Lab: Textures of Igneous Rocks in Thin Section	B&T Chapter 2
Jan 16	Lecture: Simple 1 & 2 Component Phase Diagrams	B&T Chapter 4
	Lab: Calculation of Norm & Classification of Igneous Rocks	Handout
Jan 21	Lecture: Ternary Phase Diagrams	B&T Chapter 4
	Lab: Minerals in Igneous Rocks	B&T Chapter 2
Jan 23	Lecture: Ternary Phase Diagrams	B&T Chapter 4
	Lab: Ternary Phase Diagrams	Handout
Jan 28	Lecture: The Interior of Earth and Formation of Magmas	B&T Chapter 5 B&T Chapter 7
	Lab: Basalts & Gabbros in Hand Specimen & Thin Section	WTG p. 94-135

Jan 30	Lecture: Magmatic Differentiation	B&T Chapter 6 B&T Chapter 5
	Lab: Variation Diagrams in Petrology	Handout
Feb 4	Lecture: Magmatic Differentiation	B&T Chapter 6
	Lab: Andesites & Diorites in Hand Specimen & Thin Section	WTG p. 137-158
Feb 6	Lecture: Igneous Rocks of the Oceanic Lithosphere	B&T Chapter 8
	Lab: Trace Elements in Igneous Processes	Handout
Feb 11	Lecture: Igneous Rocks of the Oceanic Lithosphere	B&T Chapter 8
	Lab: Siliceous Rocks in Hand Specimen & Thin Section	WTG p.159-192
Feb 13	Lecture: Igneous Rocks of Convergent Margins	B&T Chapter 9
	Lab: Isotopes in Igneous Processes	Handout
Feb 18	Lecture: Igneous Rocks of Convergent Margins	B&T Chapter 9
	Lab: Ultrabasic & Alkaline Rocks in Hand Specimen & Thin Section	WTG p. 193-258
Feb 20	Lecture: Igneous Rocks of the Continental Lithosphere	B&T Chapter 10
	Lab: Projected Phase Diagrams	Handout
Feb 25	Lecture: Igneous Rocks of the Continental Lithosphere	B&T Chapter 10
	Lab: Pyroclastic Rocks	WTG p.260-274
Feb 27	LECTURE MIDTERM	
	No Lab	
Mar 4-6	MARDI GRAS BREAK	
Mar 1	Lecture: Types of Metamorphism	B&T Chapter 18
	Lab: LABORATORY MIDTERM EXAM	
Mar 13	Lecture: Metamorphic Rock Textures	B&T Chapter 18
	Lab: Metamorphic Minerals & Textures	B&T Chapter 18
Mar 18	Lecture: Metamorphic Mineral Assemblages	B&T Chapter 19
	Lab: Metamorphic Minerals & Textures (continued)	B&T Chapter 18
Mar 20	Lecture: Triangular Plots in Metamorphic Petrology	B&T Chapter 20
	Lab: Triangular Plots in Metamorphic Petrology	B&T Chapter 20
Mar 25	Lecture: Triangular Plots (continued) & Thermodynamics & Metamorphic Reactions	B&T Chapter 20 B&T Chapter 21
	Lab: Contact Metamorphic Rocks in Hand Specimen and Thin Section	WTG p. 476-499
Mar 27	Lecture: Thermodynamics & Metamorphic Reactions	B&T Chapter 21
	Lab: Thermodynamics and Metamorphic Reactions	Handout
Apr 1	Lecture: Metamorphic Reactions	B&T Chapter 21
	Lab: Thermodynamics and Metamorphic Reactions (continued)	Handout
Apr 3	Lecture: Metamorphic Reactions	B&T Chapter 21
	Lab: Low - Medium Grade Metamorphic Rocks in Hand Spec.	WTG p. 514-546

Apr 8	Lecture: Geology of Field Trip Area	Handout
	Lab: TBA	
Apr 10 - 13	Field Trip to Central Texas	
Apr 15	Lecture: Contact Metamorphism	B&T Ch 22,23,24
	Lab: Low to Medium Grade Metamorphic Rocks in Thin Section	WTG p. 514-546
Apr 17	Lecture: Regional Metamorphism	B&T Ch 22,23,24
	Lab: High Grade Metamorphic Rocks in Hand Specimen	WTG p. 547-571
Apr 22	Lecture: Regional Metamorphism	B&T Ch 22,23,24
	Lab: High Grade Metamorphic Rocks in Thin Section	WTG p. 547-571
Apr 24	Lecture: Radiometric Age Dating of Igneous & Metamorphic Rocks	Lecture Notes
	Lab: Radiometric Age Dating of Igneous & Metamorphic Rocks	Handout
April 30	LECTURE FINAL EXAMINATION 1:00 P.M. to 5:00 P.M	
May 5	LABORATORY FINAL EXAMINATION 8:00 AM to Noon	

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