

January – May, 2006

GEOS 5V08 Special Topics: Petrology

- Description:** Petrology is the study of the origin and composition of igneous, metamorphic and sedimentary rocks, with an emphasis on microscopic description and interpretation. This course will focus on detailed examination of the petrology of igneous and metamorphic rocks through lectures, labs and directed readings from the literature. The objective of this course is to enable you to understand some of the principles of how igneous and metamorphic rocks are formed and their associated compositions, structures and textures. Subsidiary skills will involve use of GEOREF and Science Citation Index, EXCEL, WORD, POWERPOINT and FileMaker Pro software.
- Instructors:** Dr. Matthew Leybourne
Phone: 972-883-2403
Office: FO 2.632
Office hours: Wed 10am to 12 pm or at pre-arranged times
E-mail: mleybo@utdallas.edu
- Teaching Assistant:
Sumit Mukherjee
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sumit.mukherjee@student.utdallas.edu
- Time:** Lectures: Monday and Wednesday, 2.00 to 3.15 pm
Labs: Monday and Wednesday, 3.30 to 5.00 pm
- Location:** FO 2.222
- Textbooks:** Required:
▪ Winter, J.D., An introduction to Igneous and Metamorphic Petrology
- Recommended:
▪ MacKenzie, W.S. and Adams, A.E., 1994. A Color Atlas of Rocks and Minerals in Thin Section.
- Field Trip:** There will be a field trip. This is typically to the Llano Uplift (dates to be determined).
- Grading:** Assessment will be based on a major term paper, a second paper using real data and rocks, readings of research papers, quiz, final exam and lab exercises. Structure of classes will follow the undergraduate, with additional material during individual meetings with the instructor.

Syllabus

Date	Class#	Lectures	Laboratories
Jan 9 (M)	1	Assignment – self paced	
Jan 11 (W)	2	Assignment – self paced	
Jan 16 (M)		MLK day (no class)	
Jan 18 (W)	3	Introduction and classification of igneous rocks	Hand out keys, quickie quiz
Jan 23 (M)	4	Igneous and metamorphic thermodynamics	TBD
Jan 25 (W)	5	Phase diagrams – I - igneous	TBD
Jan 30 (M)	6	Phase diagrams – II - metamorphic	TBD
Feb 1 (W)	7	Chemical Petrology I	Introduction to Jigsaw concept
Feb 6 (M)	8	Chemical Petrology II	Preparing for Jigsaw – introduction to petrography cart, EXCEL, and Filemaker
Feb 8 (W)	9	Generation and modification of melts	Mafic volcanics – I
Feb 13 (M)	10	MOR – I	Mafic volcanics – II
Feb 15 (W)	11	MOR – II	Teach mafic volcanics
Feb 20 (M)	12	MOR – III	Felsic volcanics – I
Feb 22 (W)	13	Hotspots and Plumes – I	Felsic volcanics – II
Feb 27 (M)	14	Hotspots and Plumes – II	Teach felsic volcanics
Mar 1 (W)	15	Hotspots and Plumes – III	Plutonic rocks – I
		SPRING BREAK Mar 7-12	Plutonic rocks – II
Mar 13 (M)	16	Quiz 1	Teach plutonic rocks
Mar 15 (W)	17	Island arcs – I	Review of Igneous rocks in TS
Mar 20 (M)	18	Island arcs - II	
Mar 22 (W)	19	Hydrothermal and geothermal metamorphism	Quiz – take home – due March 27
Mar 27 (M)	20	Continental arcs	Contact/hydrothermal metamorphic rocks -
Mar 29 (W)	21	Continental arcs and paired metamorphic belts – I	Contact/hydrothermal metamorphic rocks -
Apr 3 (M)	22	Continental arcs and paired metamorphic belts – II TERM PAPERS DUE – NO EXTENSIONS	Teach contact/hydrothermal metamorphic rocks
Apr 5 (W)	23	Continental Alkaline rocks – I	Regional metamorphic rocks – I
Apr 10 (M)	24	Continental Alkaline rocks – II	Regional metamorphic rocks – II
Apr 12 (W)	25	Class presentations – I	Teach Regional metamorphic rocks
Apr 17 (M)	26	Class presentations – II	Review of metamorphic rocks
Apr 19 (W)	27	Meteorites	Samples from NASA
Apr 24 (M)	28	Review – pulling it all together	Final Lab Exam
May 1 (M)	2.00 pm	Final Exam (3 hours, comprehensive)	