

## Course Syllabus

### Special Topics in Igneous Petrology

GLY 6932 and GLY 4930

Fall 2019

Class Meeting Time T

#### Instructor Information

**Office Hours: MWF 4-6 pm**

Dr. Michael Perfit

365 Williamson Hall

392-2128

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#### Course Overview or Purpose

Through reading older, classic papers and recent publications students will learn about the compositional variability, phase relations, isotopic compositions and petrogenetic history of igneous rocks. We will discuss mantle melting and sources, magmatic plumbing systems, chemical variations in magmatic suites (MORB, Ocean Islands). Theories of petrotectonic associations and magmagenesis will be introduced and petrogenetic modeling will be explored. Some time may be allocated to the petrography and textures of igneous rocks and will be held in the optics lab WH101 (possibly on Mondays).

#### Course Objectives and/or Goals

Upon successful completion of the course, students should have a solid understanding of the various types of igneous rocks that are formed in different tectonic environments and the petrogenetic processes that are involved in their generation. We will cover the physical, chemical and tectonic aspects of magmatism – in particular oceanic islands. Students will also gain experience in plotting and interpreting geochemical data, interpreting phase diagrams, modeling fractionation processes and mantle melting.

I expect you to attend all classes, be attentive, ask and answer questions and to complete all readings and assignments on time.

#### Course Materials

##### Required Text (sort of)

**Individual publications will be provided via Canvas to read.**

Chapters from The Encyclopedia of Volcanoes (2015) <http://www.sciencedirect.com/science/book/9780123859389> (<http://www.sciencedirect.com/science/book/9780123859389>)

and the Encyclopedia of Marine Science will be provided as pdfs via our Canvas course site as we progress.

### Recommended Text:

(HR) Rollinson, H.; 1993. Using Geochemical Data: Evaluation, Presentation, Interpretation. Longman, 352p.

PDF copies of some of the chapters are available on line

### Course Requirements/Evaluation/Grading

Active participation in discussion in class	continuously	100
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#### Letter

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	WF	I	NG	S-U
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#### Grade

4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0.0	0.0	0.0	0.0	0.0
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#### Points

For greater detail on the meaning of letter grades and university policies related to them, see the Registrar's Grade Policy regulations at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx> (<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>)





Topical Outline (Chapters in Rollinson other readings and chapters from books will be provided)

Week 1	Chapt. 1	Introduction and basic principles
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Week 2	Chapt. 2	Mantle melting and magma diversification -
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Week 3	Chapt. 3	Magma Differentiation
Week 4	Readings	Mid-ocean Ridge Geochemistry
	Readings	Mantle Geochemistry
	Chapt. 6	Isotopic systematics
Week 5	No Class GSA	
Week 6 -7	Readings	Introduction to Ocean Islands (Background)
Week 8	Readings (guest lecture)	Mantle Plumes and Hotspots
Week 10 -11	Readings	OIB Modern concepts / isotopes
Week 12-13	Readings	OIB/MORB Petrology/Experimental
Week 14	Readings	
Week 15	AGU	
Week 16		

## Course Summary:

Date	Details
	 <a href="https://ufl.instructure.com/courses/385331/assignments/3983468">Igneous Differentiation and Variation Diagrams :Major Element Harker Diagrams HW#2 (https://ufl.instructure.com/courses/385331/assignments/3983468)</a>
	 <a href="https://ufl.instructure.com/courses/385331/assignments/3983470">Petrographic descriptions HW1 (https://ufl.instructure.com/courses/385331/assignments/3983470)</a>
	 <a href="https://ufl.instructure.com/courses/385331/assignments/3983471">Using Computer Software to Model Magma Evolution (https://ufl.instructure.com/courses/385331/assignments/3983471)</a>
	 <a href="https://ufl.instructure.com/courses/385331/assignments/3983472">Using trace elements in magmatic systems Homework #4 (https://ufl.instructure.com/courses/385331/assignments/3983472)</a>



