

Course Syllabus

Advanced Igneous Petrology

GLY 5328 (1112) and GLY 4930 (1111)

Fall 2020

Class Periods **M** (5-6) 11:35- 1:40. **W** (5) 11:45-12:35

Instructor Information

Office Hours: MWF 3-5 pm

Dr. Michael Perfit

365 Williamson Hall (or at home in my office via Zoom)

392-2128

e-mail: mperfit@ufl.edu

Course Overview or Purpose

Students will learn about the compositional variability, using geochemical data, phase relations, trace element distribution and petrogenetic history of igneous rocks. We will discuss mantle melting and sources, magmatic plumbing systems, chemical variations in magmatic suites (mid-ocean ridges, island arcs). Theories of petrotectonic associations and magmagenesis will be introduced and petrogenetic modeling will be explored. The later part of the class will focus on the petrology, chemistry and tectonics of island arcs. Some class periods will be focused on the petrology 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 island arcs. Students will also gain experience in plotting and interpreting geochemical data, interpreting phase diagrams, modeling fractionation processes and mantle melting. The culmination of the class involves a project that requires a written report in which students will use their knowledge and skills to evaluate the petrogenetic history of an igneous rock suite of their choice.

At this time, I expect all of the lectures and discussions will be online via ZOOM. I expect you to participate in all aspect of the lectures and to have completed all the assignments before the class periods. Each of the classes will be recorded so you can play them again as an aid to learning the material. Please be attentive, ask and answer questions during each class. At times, I may separate groups of you into "chat rooms" to discuss a specific question or problem that you will subsequently present to the entire class as a whole.

Course Materials

Required Texts (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:

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

I have pdf copies of these if you need them

Course Requirements/Evaluation/Grading

Requirement	Due date	% of final grade
Midterm Exam	October 12	20%
Oral Presentation	TBA (various)	15%
Homework Problems	Various	20%
Class Participation	Always	20%
Final Project	December	25%

Percentage or points earned in class

93%-100% 90%-92.9% 85%-89.9% 80%-84.9% 77%-79.9% 74%-76.9% 70%-73.9% 67%-69.9% 60%-66.9% Below 60%

Letter Grade equivalent

A A- B+ B B- C+ C C- D F

Letter Grade

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

Grade Points

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

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](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 Aug 31	Chapt. 1	Introduction and basic principles
Week 2 Sept 7	Chapt. 3	Mantle melting and magma diversification
Sept 9	Readings	Mantle compositions/mineralogy
Week 3 Sept 14	Chapt. 3	Magma Differentiation. (HW #1)
Sept 16	Chapt. 4.	Using Major and Trace Elements
Week 4 Sept 21	Readings	Mid-ocean Ridge Geochemistry
Week 5 Sept 28	Readings	Mantle Plumes and Hotspots. (HW #2)
Week 6 Oct 5	Readings	Other Oceanic Volcanism
Week 7 Oct 12	Mid-term exam	
Oct 14	Reading	Introduction to Island Arcs
Week 8 Oct 19	Readings	Island Arcs Modern concepts / isotopes
Week 9 Oct 26	Readings	Volcanic Arc Petrology/Experimenta
Week 10 Nov 2	Readings	Island Arcs (Aleutian Islands)
Week 11 Nov 9	Readings	Island Arcs (Western Pacific)
Week 12 Nov 16	Readings	Back arcs and Fore arcs
Week 13 Nov 23	TBA	
Week 14 Nov 30	Presentations – Project planning	
Week 15 Dec 7	Final project due	

Statement of University's Honesty Policy (cheating and use of copyrighted materials)

Academic Integrity – Students are expected to act in accordance with the University of Florida policy on academic integrity (see Student Conduct Code, the Graduate Student Handbook or this web site for more details:

<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/> (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>)

Cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior. Helping each other on homework is acceptable but the work handed in **MUST** be your own work.

UF Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied: On my honor, I have neither given nor received unauthorized aid in doing this assignment.

Policy Related to Class Attendance

You are expected to attend all classes unless you are attending a scientific meeting or are previously excused in advance (by email, phone or personal notification).

Policy Related to Make-up Exams or Other Work

I expect you to attend and be prepared to participate in all class sessions. Personal issues with respect to class attendance or fulfillment of course requirements will be handled on an individual basis.

Statement Related to Accommodations for Students with Disabilities

Accommodations for Students with Disabilities

If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office (<http://www.dso.ufl.edu/> (<http://www.dso.ufl.edu/>)). The Dean of Students Office will provide documentation to you, which you then give to the instructor when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework.

Counseling and Student Health

Students may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the University of Florida Counseling Center, 352-392-1575, or Student Mental Health Services, 352-392-1171. Visit their web sites for more information: <http://www.counsel.ufl.edu/> (<http://www.counsel.ufl.edu/>)

The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services, including primary care, women's health care, immunizations, mental health care, and pharmacy services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: <http://shcc.ufl.edu/> (<http://shcc.ufl.edu/>)

Crisis intervention is always available 24/7 from: Alachua County Crisis Center: (352) 264-6789