

## IGNEOUS AND METAMORPHIC PETROLOGY

GLY4310CC, COURSE 13244 AND 13245 (SECTIONS 07D9 AND 177H), 4 CREDIT HOURS, SPRING 2023

Tuesday and Thursday periods 6-7, Wm 202

Lab: 07D9 (Lab M. per. 8-9), 177H (Lab W. per. 4-5) in Wm101

**INSTRUCTOR:** Dr. Matthew Smith

Office number: Williamson Hall, Room 269 E-mail

address: [mcsmith@ufl.edu](mailto:mcsmith@ufl.edu)

phone number: (352) 392-2106

**OFFICE HOURS:** Wm 269 (also by Zoom, email, phone): Mon, Tues, Thursday 10-11:30 or by appointment.

**Zoom office hours meeting room:** <https://ufl.zoom.us/j/4902865705>

**Email:** Please use the mail tool within Canvas. Alternatively, I can be reached at [mcsmith@ufl.edu](mailto:mcsmith@ufl.edu);

**Office:** Williamson 269; 352-392-2106

**TAs/Lab Instructors:** Daniel Astudillo Manosalva ([daniel.astudillo@ufl.edu](mailto:daniel.astudillo@ufl.edu) ; WM 263) and Danilo Do Nascimento Cruz ([daniilojodonascim@ufl.edu](mailto:daniilojodonascim@ufl.edu) ; WM274).

A separate lab syllabus will be provided by your lab instructors that includes their office hours and detailed contact info (in addition to the schedule of assignments, policies, etc.).

**COURSE WEBSITE:** <http://elearning.ufl.edu>

**COURSE COMMUNICATIONS:** For any class-related questions, students should use the **Course Questions Discussion Forum**. This will benefit all students that might have similar questions. The instructor will regularly answer all questions and participate in this forum. Students should check if the question they have has already been answered in the forum before posting. *Private questions should be sent to the instructor through the course management system, or to instructors .ufl e-mail address (this would include questions about grades, late work, etc.).* Emails will be responded to within 24 hours except on weekends when it may take a little longer.

**Text: (Required)** Principles of Igneous and Metamorphic Petrology 2<sup>nd</sup> Ed; J. D. Winter; Prentice Hall. (First Addition is OK.... **BUT** be aware that page numbers I assign are likely different in that edition and there are some new sections that will not be in the first edition. Last month I was notified that the

publisher stopped supporting/selling this textbook so you will need to procure it by means other than the UF bookstore (Amazon, whatnot....there are abundant copies available).

### **Lab text: Handouts will be provided before each class**

- Recommended (not required) references (#'s 1 and 4 provide the most info. #'s 2 and 3 are similar to one another, have color imagery and can replace an optical book though they are not as complete a resource. Note that some references (including those listed below) are kept in the lab for your use but there may be only 1 or 2 copies. There are numerous online resources available as well that can supplement or serve in the stead oof the resources below (we'll link to online resources in the canvas ab Support page.

1. A basic mineralogy text including Optical Mineralogy (Nesse, for example)
2. Petrology of Igneous and Metamorphic Rocks by A. R. Philpotts; Prentice Hall
3. Minerals in Thin Section: Dexter Perkins and Kevin R. Henke; Prentice Hall
4. Petrography of Rocks in Thin Section: Williams, Turner and Gilbert (no longer in print)

**MATERIALS AND SUPPLIES FEES:** \$75.84 combined material and supply fee and Equipment Maintenance Fee

### **COURSE SUMMARY AND OBJECTIVES:**

- **This course covers a great deal of material.** It is important that you attend all classes, keep up with the reading assignments and spend extra time in the lab. I expect you to read all of the assigned material and complete your assignments on time. Late submission of assignments will result in a reduction of 5% pts. per late day unless prior approval has been given(see late work policy below). Neatness, spelling (spelling like that used in texting is not acceptable) and grammar count (for essay-type written responses and papers). **All written responses are required to be your own words. Plagiarism will not be tolerated (whether it be an uncited published source, Artificial Intelligence or your peer, etc. ).**

The subject material assumes a working knowledge of Physical Geology (e.g rock names, plate tectonics), Mineralogy, and basic Chemistry and Physics. If you are weak in these areas, make sure you review them.

- It is VERY important to review the volcanic, petrologic and metamorphic parts of your Physical Geology class and the mineral associations and phase diagrams from your Mineralogy class.
- Participation in class and in your group (if in a group context) is very important – you should not only try to answer questions based on your reading but also learn from your mistakes and discussion among your teammates.

- It is important for you to learn where significant “petrologic” localities are in the world and how they are related to plate tectonics. I will provide you with copies of important overheads and PowerPoint presentations that I show in class (on a Canvas course web site).
- I have very high expectations of you. I will put a great deal of effort into this class and I expect the same from you. This is a demanding class that can be difficult if you do not keep up with the reading and or lectures. **I am willing and available to help you with any problems you may have with the course material, whether that be during office hours or outside of scheduled hours.**

**GENERAL EDUCATION:** This course does not satisfy a General education requirement

**PREREQUISITE KNOWLEDGE AND SKILLS:** Students should have completed courses in Physical Geology (GLY2010C, 2030C or the equivalent), Mineralogy or equivalent (GLY3202C accepted), and CHM1024 or higher.

#### COURSE POLICIES:

**REQUIREMENTS:** Students are expected to:

- Complete all assignments in a timely fashion.
- Actively participate in all class activities.
- Complete the 3 in-class course exams and Final Exam (held during final exam week)
- Complete the course paper/paper.
- Complete lab assignments and assessments

**EXAM DATES/POLICY:** There are the non-comprehensive in-class exams each worth 10% of the overall course grade. Details regarding the exam scheduling are provided in the course schedule. Additionally there is a comprehensive final exam held during finals week as schedule in the [Final Exam Schedule](#) (scroll down to get to spring semester).

**ATTENDANCE AND PARTICIPATION:** This 4000-level course meets twice per week. Regular attendance is expected and your attendance and participation contribute to your overall course grade. Attendance will be randomly taken throughout the term.

**LATE WORK AND MAKE-UP POLICY:** Assignments may be submitted up to one week late with a penalty of 5% of the score per day late (or fraction thereof). Discussion posts if assigned that are more than one day late may not be accepted (penalty for late submission is integrated into the rubric). A note may be required to make-up any missed exams or work overdue by more than one week.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

**COURSE TECHNOLOGY:** Access to and on-going use of a computer is required for all students. Competency in the basic use of a computer is required. Course work will require use of a computer and a broadband connection to the Internet. For additional information on UF College of Liberal Arts and Sciences policy regarding computer requirements you can visit: <http://it.clas.ufl.edu/policies/student-computer-requirement/>

For technology related issues the UF computing help desk can be reached at: <http://helpdesk.ufl.edu>

- (352) 392-HELP - select option 2

**ONLINE COURSE EVALUATION:** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at [gatorevals.aa.ufl.edu/students/](http://gatorevals.aa.ufl.edu/students/). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via [ufl.bluera.com/ufl/](http://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at [gatorevals.aa.ufl.edu/public-results/](http://gatorevals.aa.ufl.edu/public-results/).

## GRADING POLICIES:

Your course grade based on the following categories (percentage breakdown included)

### Grade evaluation:

- 25% Lab Assignments and quizzes
- 10% final project/ paper (this will combine elements of both lab and lecture)
- 8% lecture practice quizzes
- 7% Lecture class activities, attendance, and homework assignments
- 35% Exams (3 exams)
- 15% Final Exam

### GRADING SCALE: Grading Scale (& GPA equivalent):

| Grade | %   | Grade Points |  | Grade | %       | Grade Points |
|-------|-----|--------------|--|-------|---------|--------------|
| A     | ≥93 | 4.0          |  | C     | 73 – 76 | 2.0          |

|    |         |      |  |    |         |      |
|----|---------|------|--|----|---------|------|
| A- | 90 – 92 | 3.67 |  | C- | 70 – 73 | 1.67 |
| B+ | 87 – 89 | 3.33 |  | D+ | 64 – 66 | 1.33 |
| B  | 83 – 86 | 3.0  |  | D  | 60 – 63 | 1.0  |
| B- | 80 – 83 | 2.67 |  | D- | 57 – 59 | 0.67 |
| C+ | 77 – 79 | 2.33 |  | E  | < 56    | 0    |

**Note:** A grade of C- is not a qualifying grade for major, minor, Gen Ed, or College Basic distribution credit. For further information on UF's Grading Policy, see:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx#grades>

#### COURSE SCHEDULE:

**CRITICAL DATES:** Exams 1: 2/9, Exam2: 3/9, Exam 3: 4/4, Final Exam 5/2). All dates subject to change with advance notice. Deadlines for all deliverables (assignments, discussions, exams, etc.) are included and maintained in the Canvas course schedule.

Disclaimer: This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

#### UF POLICIES:

##### **Disclaimer regarding recording of live sessions:**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student

Note: In the event of Zoom meetings (for example, an evening review session), these may be audio visually recorded by the instructor for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared.

**University Policy on Accommodating Students with Disabilities:** Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. [Click here to get started with the Disability Resource Center](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive; therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

**Student Evaluation of Course and Instructor:** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at [gatorevals.aa.ufl.edu/students/](https://gatorevals.aa.ufl.edu/students/). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via [ufl.bluera.com/ufl/](https://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at [gatorevals.aa.ufl.edu/public-results/](https://gatorevals.aa.ufl.edu/public-results/).

**Academic Honesty:** By enrolling in this course, you agree to the University’s Honor Code: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of

behaviors that are in violation of this code and the possible sanctions. Click [here](#) to read the Conduct Code. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Failure to comply with this code will result in a failing (E) grade in this course. If you are unsure if what you are doing would constitute breaking the code, contact the instructor. For example, working as a group in lab is a good way to bounce ideas and learn from each other. However, each student still needs to turn in their own individual work and come to their own justifiable conclusions.

**NETIQUETTE: COMMUNICATION COURTESY:** All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats.

<http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf>

**UF ONLINE HANDBOOK:** Additional information can be found on <http://handbook.ufl.edu/>

## Campus Resources:

### Health and Wellness

*U Matter, We Care:* If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

*Counseling and Wellness Center:* [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

*Student Health Care Center:* Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).

*University Police Department:* [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

*UF Health Shands Emergency Room / Trauma Center:* For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road,

Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

### Academic Resources

*E-learning technical support:* Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

[Career Connections Center](#): Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

[Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources.

[Teaching Center](#): Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring.

[Writing Studio](#): 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

*Student Complaints On-Campus*: [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)

*On-Line Students Complaints*: [View the Distance Learning Student Complaint Process.](#)

## GETTING HELP:

For issues with technical difficulties for E-learning, please contact the UF Help Desk at:

- [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu)
- (352) 392-HELP - select option 2
- <http://helpdesk.ufl.edu/>

Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from The Help Desk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Other resources are available at <http://www.distance.ufl.edu/getting-help> for:

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support





**TENTATIVE SCHEDULE:**

| <b>Date</b>  | <b>Topic</b>  | <b>Reading</b> | <b>Lab Date</b> | <b>Lab Topic</b>  |
|--------------|---|----------------|-----------------|---|
| 9-11 Jan     | Introduction to class<br>Basic Concepts -Earth origin and structure     | Ch 1<br>Ch 2   | 1/8-<br>1/10    | Lab 1a: Classification & Textures of Igneous Rocks Part 1 |
| 16-Jan       | Igneous Rock Classification & Textures                                  | Ch 2/3         | 1/15-<br>1/17   | Holiday: <i>No lab meetings</i>                           |
| 18-Jan       | Igneous Rock Classification & Textures                                  | Ch 3           |                 |   |
| 23-25 Jan    | Igneous Rock Classification & Textures; Intro to field relations.       | Ch 3/4         | 1/22-<br>1/24   | Lab 1b: Classification & Textures of Igneous Rocks Part 2 |
| 30-Jan       | Igneous Structures and Field Relations                                  | Ch 4           | 1/29-<br>1/31   | Lab 2: Crystallization                                    |
| 1-Feb        | Igneous Structures and Field Relations                                  | Ch 4           |                 |   |
| 6 Feb        | Phase Rule and one component systems and Binary Systems                 | Ch 6/7         | 2/5-2/7         | Lab 3: Phase Diagrams                                     |
| <b>8-Feb</b> | <b>Exam 1: (Ch 1-4)</b>   |                |                 |   |
| 13 Feb       | Binary Systems  | Ch6/7          | 2/12-<br>2/14   | Lab 4: Mid-Ocean Ridge Basalts                            |
| 15-Feb       | Binary Systems/Ternary Systems  | Ch 8           |                 |   |
| 20-Feb       | Chemical Petrology- major elements – concepts/modeling and magma series | Ch 9           | 2/19-<br>2/21   | Lab 5: Ocean Island Basalts                               |
| 22-Feb       | Chemical Petrology major elements – modeling                            | Ch 9           |                 |   |
| 27-Feb       | Chemical Petrology trace elements                                       | Ch 9           | 2/26-<br>2/28   | Lab 6: Island Arcs  |
| 29-Feb       | Chemical Petrology- trace elements/isotopes                             | Ch9            |                 |   |

|                   |  |          |           |   |
|-------------------|--|----------|-----------|---|
| 5-Mar             | Mantle Melting and Basaltic Magma genesis                    | Ch 10    |           |   |
| 7-Mar             | <b>Exam 2: (Ch 6-9)</b>                                      |          | 3/4-3/6   | Lab 7: Continental Arcs   |
| 9-16 Mar          | <b>SPRING BREAK</b>  |          |           |   |
| 19-Mar            | Basalt Genesis and Magma diversification                     | Ch 11    | 3/18-     | Lab 8: Granitoids   |
| 21 Mar            | Mid-Ocean Ridges and   | Ch 13    | 3/20      |   |
| 26-Mar            | Ocean Island Basalts   | Ch 13    | 3/25-     | Lab 9: Classification & Textures of Metamorphic Rocks           |
| 28-Mar            | Subduction Zone Volcanism – Island arcs and Continental Arcs | Ch 16/17 | 3/27      |   |
| 2-Apr             | <b>Exam 3 (10, 11, 13, 14)</b>                               |          | 4/1-4/3   | Lab 10: Chemistry of Metamorphic Rocks                          |
| 4-Apr             | Metamorphism and Metamorphic Rocks                           | Ch 21/22 |           |   |
| 9-Apr             | Metamorphism and Metamorphic Rocks                           | Ch 21/22 | 4/8-      | Lab 11: Barrovian Sequence Metamorphism                         |
| 11-Apr            | Metamorphic Facies and Mafic Rocks                           | Ch 25    | 4/10      |   |
| 16-Apr            | Metamorphic Facies and Mafic Rocks                           | Ch 25    | 4/15-4/17 | Lab 12: Metamorphism of Mafic, Calcareous, and Ultramafic Rocks |
| 18-Apr            | Metamorphism of Pelitic Rocks                                | Ch 28    | 4/22-     | Final Project   |
| 22-Apr            | Metamorphism of Pelitic Rocks                                | Ch 28    | 4/24      |   |
| Thursday<br>May 2 | <b>Final Exam 10:00 am-12:00 pm (group B)</b>                |          |           |   |