Igneous and Metamorphic Petrology GEOL 3414
Department of Physical & Environmental Sciences
Spring 2015

A. COURSE INFORMATION
Course number/section: GEOL 3326.001
Class meeting time: Tuesday and Thursday 11:00 – 12:15
Class location: IH – 163
Labs: Tuesday 09:00 – 10:50, CS – 226
Thursday 02:00 – 03:50, CS – 226
Course Website: bb9.tamucc.edu

B. INSTRUCTOR INFORMATION
Instructor: Dr. Valeriu Murgulet
Office location: CS 205
Office hours: Monday 10:00 – 1:00
Telephone: 361-825-6023
e-mail: valeriu.murgulet@tamucc.edu
Appointments: by email

C. COURSE DESCRIPTION
Genesis and occurrence of igneous and metamorphic rocks. Mineralogical composition and thermodynamics of geologic systems. Determination of rock types in hand specimens and thin sections.

D. PREREQUISITES AND COREQUISITES
Prerequisites
Mineralogy (GEOL 3411)

Corequisites
None.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
Required Textbook

Other References
Winter’s Petrology course website:
http://www.whitman.edu/geology/winter/
Supplies
A bound notebook
Mechanical pencil, lead size of 0.5 mm or finer
Metric ruler (cm/mm markings)
Protractor or a ruler/protractor

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT
By the end of this course, you should be able to:
1. classify igneous rocks in hand specimens and thin-section, and by using geochemical
discrimination diagrams,
2. classify metamorphic rocks based on grade and protolith, both in specimens and thin
section,
3. determine histories of igneous and metamorphic rocks based on textures,
4. use phase diagrams to infer stable igneous and metamorphic mineral assemblages under
various pressure and temperature conditions,
5. discuss the origin, evolution and diversification of magmas, including the role of
equilibrium and disequilibrium crystallization and
6. discuss methods of determining pressure and temperature conditions for metamorphic
rocks.

G. INSTRUCTIONAL METHODS AND ACTIVITIES
The class will meet on Tuesdays and Thursdays throughout the semester in the classroom to
cover the igneous and metamorphic petrology topics. Lecture power point slides, class
exercises, discussions will be used while in the classroom. Class lectures prepare you for the
lab assignments and for working the field trip assignments. In addition, you are expected to
read relevant textbook chapters as announced in class in preparation for lecture and lab
assignments. Thus, laboratory exercises will complement the material presented during the
lectures.

H. MAJOR COURSE REQUIREMENTS AND GRADING
The following assessment tools will be used:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Chapter Quizzes (Lecture)</td>
<td>10</td>
</tr>
<tr>
<td>Midterm Exam (Lecture)</td>
<td>20</td>
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<tr>
<td>Final Exam (Lecture)</td>
<td>20</td>
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<tr>
<td>Homework (Lecture)</td>
<td>25</td>
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<tr>
<td>Lab Assignments</td>
<td>10</td>
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# I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>WEEK OF</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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<tbody>
<tr>
<td>January 22</td>
<td>Igneous rock classification &amp; textures</td>
<td>Chapters 1,2,3</td>
<td>Homework</td>
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<tr>
<td>January 26</td>
<td>Igneous rock classification &amp; textures</td>
<td>Chapters 1,2,3</td>
<td>Homework</td>
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<tr>
<td>February 2</td>
<td>Igneous rock field relationships</td>
<td>Chapter 4</td>
<td>Homework</td>
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<tr>
<td>February 9</td>
<td>Thermodynamic principles</td>
<td>Chapter 5</td>
<td>Homework</td>
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<tr>
<td>February 16</td>
<td>The phase rule; one- and two-component systems</td>
<td>Chapter 6</td>
<td>Homework</td>
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<tr>
<td>February 23</td>
<td>Chemical Petrology I</td>
<td>Chapter 8</td>
<td>Homework</td>
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<tr>
<td>March 2</td>
<td>Chemical Petrology II, Generation of magmas</td>
<td>Chapters 9, 10</td>
<td>Homework</td>
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<tr>
<td>March 9</td>
<td>Generation of magmas Midterm Exam</td>
<td>Chapter 10</td>
<td>Homework</td>
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<tr>
<td>March 16</td>
<td>Spring Break – No classes</td>
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<td>Homework</td>
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<tr>
<td>March 23</td>
<td>Introduction to Metamorphism and Barrovian metamorphism</td>
<td>Chapters 21,22</td>
<td>Homework</td>
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<tr>
<td>March 30</td>
<td>Metamorphic textures</td>
<td>Chapter 23</td>
<td>Homework</td>
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<tr>
<td>April 6</td>
<td>Metamorphic mineral assemblages and reactions</td>
<td>Chapter 24</td>
<td>Homework</td>
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<tr>
<td>April 13</td>
<td>Metamorphic Facies</td>
<td>Chapter 25</td>
<td>Homework</td>
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<tr>
<td>April 20</td>
<td>Metamorphic Reactions</td>
<td>Chapter 26</td>
<td>Homework</td>
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<tr>
<td>April 27</td>
<td>Metamorphism of Carbonate Rocks, Geothermobarometry</td>
<td>Chapter 27, 29</td>
<td>Homework</td>
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<tr>
<td>May 4</td>
<td>Metamorphic Fluids and Metasomatism</td>
<td>Chapter 30</td>
<td>Homework</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.
J. COURSE POLICIES

Attendance/Tardiness

Lecture attendance is not required but it is strongly advised. Poor attendance will result in missed lecture material and may reflect in less than desired class performance and/or unsuccessful class completion. Lab attendance is mandatory. Unexcused absences result in a zero. Lab assignments are due after one week, 10% grade deduction/day is enforced for assignments that are not turned in time.

Late Work

There is no provision for making up late and/or missed (lab) work. It is also your responsibility to obtain notes and announcements from fellow students in the event you miss a class. Lab assignments that are turned in late will

Extra Credit

None

Cell Phone Use

Not allowed in the class.

Food in Class

Not allowed in the class.

Missed Exams/Quizzes

Exams can only be taken during the scheduled time, except in cases of emergencies. Documented proof is required of such emergencies. There will be no make up exams or quizzes for unscheduled and unexcused absence. Make-up exams cannot be taken after the graded test has been given back to the class.

Participation

Group discussion and collaboration are encouraged during lab exercises.

K. COLLEGE AND UNIVERSITY POLICIES

- Academic Integrity (University)
  It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
  See Full University Policy at
  http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity

- Classroom/Professional Behavior
• **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course by Friday, April 10, 2015. No student is eligible to receive a W without completing the official drop process by this deadline. Visit the Office of the University Registrar for the Course Drop Form that must be submitted. After April 10, 2015 a student will not be allowed to drop a course.

• **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

• **Disability Services**
  Disability Services (DS) is the hub for coordinating services and accommodations to ensure accessibility and utilization of all programs for all Texas A&M University-Corpus Christi students with disabilities. Our services are designed to meet the unique educational needs of enrolled students with documented permanent or temporary disabilities. DS provides intake and consultation services to students seeking to register with our office. DS reviews an individual’s documentation of disability and assesses eligibility for services and the determination of reasonable accommodations. For more information visit the Disability Services Office at 116 Corpus Christi Hall or go to [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

L. **OTHER INFORMATION**

N/A.

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely
manner during regularly scheduled lecture periods.