Mineralogy – GEOL 3411
Department of Physical and Environmental Sciences
Fall Semester 2015

A. COURSE INFORMATION

Course number/section: GEOL 3411.001/.101/.102/.103
Class meeting time: Tuesdays and Thursdays 9:30–10:45 a.m.
Lab meeting time: Tuesdays 12:00 to 01:50 p.m. (Section 101)
Thursdays 12:00 to 01:50 p.m. (Section 102)
Tuesdays 04:00 to 05:50 p.m. (Section 103)
Class location: IH-267 (Lecture), CS-226 (Lab)
Course Website: https://bb9.tamucc.edu/webapps/portal/frameset.jsp

B. INSTRUCTOR INFORMATION

Instructor: Thomas Naehr, Ph.D.
Office location: HRI-119 or FC-171 (preferred)
Office hours: TR 11:00 a.m. to noon and MWF 10:00 to 11:00 a.m. or by appointment
Telephone: 361.825.2470
Email: thomas.naehr@tamucc.edu
Appointments: Appointments can be made by phone or email (preferred).

C. COURSE DESCRIPTION

Catalog Course Description
Study of the physical and chemical properties of minerals. Introduction to the crystallography of minerals, optical mineralogy, and the use of the polarized light microscope. Laboratory study of mineral identification in hand specimens and thin sections. Prerequisites: GEOL 1403, CHEM 1411, and CHEM 1412 (may be taken concurrently). SMTE 0094 is a corequisite for this course. Documented completion of this safety training is required early in the semester for continued participation in this course. Safety training given during a laboratory meeting early in the semester is required for continued participation in this course.

Extended Course Description
This is a course in college-level Mineralogy primarily for students majoring in Geology or Environmental Science. Coursework will include the study of physical and chemical properties of minerals, introduction to the crystallography of minerals, optical mineralogy, and the use of the polarized light microscope. Laboratory study of mineral identification in hand specimens and thin sections.

D. PREREQUISITES AND COREQUISITES

Prerequisites
GEOL 1403, CHEM 1411, CHEM 1412 (may be taken concurrently).
Corequisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

*It is extremely important that you read the assigned chapters and stay current with the reading.* The concepts presented here are challenging so you may need to read this material multiple times. All reading assignments are to be read prior to the class in which the material will be discussed.

Supplies
The lab exercises (and partially the lectures) will require the use of some basic drafting supplies. The following is a list of what’s needed. Please bring these items with you to each session.

- Mechanical pencil, lead size of 0.5 mm or finer (required)
- Eraser (required)
- Colored pencils (at least six colors, required)
- Triangle (optional)

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Explain the main concepts central to the study of minerals, including symmetry, crystal chemistry, and crystal structure.
2. Describe the basic concepts and theory of optical mineralogy.
3. Identify the most important physical and optical properties of minerals.
4. Identify the most common minerals based on these properties in hand specimen and thin section.
G. INSTRUCTIONAL METHODS AND ACTIVITIES

We will use a variety of instructional methods in this course, including lectures, discussions, and hands-on exercises.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Evaluation and Grade Assignment
Your final grade will be based on a % curve from the following point distribution:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>A) Mid-Term Exam:</td>
<td>100 points</td>
</tr>
<tr>
<td>B) Final Exam:</td>
<td>100 points</td>
</tr>
<tr>
<td>C) Laboratory Exams:</td>
<td>2 @ 100 points each</td>
</tr>
<tr>
<td>D) Chapter Quizzes</td>
<td>5 or more @ 10 points each</td>
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<tr>
<td><strong>Total:</strong></td>
<td><strong>450 points</strong></td>
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A perfect score in this course would be to earn all 450 points available. At the end of the semester, I will take the highest point total in the class and will use that high score to calculate the percentage bonus required to bring this individual’s total points up to 450. That percentage bonus is then applied to everyone’s individual total.

Final grading will be as follows:
A = 450-403 points   B = 402-358 points   C = 357-313 points   D = 312-268 points   F < 268 points

I. COURSE CONTENT/SCHEDULE

**Important Dates**

August 26  Classes begin
September 07  Labor Day (campus closed)
**October 08**  Mid-term exam
October 13/15  Lab Mid-term exam
November 06  Last day to drop a class
November 24  Lab Final Exam, Sections .101 and .103
November 26/27  Thanksgiving holidays (campus closed)
December 01  Lab Final Exam, Section .102
December 01  Last day of classes
December 08  Final exam 08:00 a.m. – 10:30 a.m.

**Lecture and Lab Schedule**

**August**
Thu  08/27  Introduction/Definitions, Chapter 1

**September**
Tue  09/01  Crystallography I – Symmetry, Chapter 2
<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Course</th>
<th>Chapter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thu</td>
<td>09/03</td>
<td>Crystallography II – The Crystal Systems</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>Thu</td>
<td>09/08</td>
<td>Crystallography III – Miller Indices</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>Thu</td>
<td>09/10</td>
<td>Crystal Chemistry I</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>Thu</td>
<td>09/17</td>
<td>Crystal Structure I</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>Thu</td>
<td>09/24</td>
<td>Mineral Growth I</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>Thu</td>
<td>09/29</td>
<td>Mineral Growth II</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>Thu</td>
<td>10/01</td>
<td>Native Elements, Sulfides, and Related</td>
<td>Chapter 6, 19, 20</td>
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<tr>
<td>Thu</td>
<td>10/08</td>
<td>Mid-Term Exam</td>
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<tr>
<td>Thu</td>
<td>10/15</td>
<td>Carbonates, Sulfates, Phosphates…</td>
<td>Chapter 17</td>
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<tr>
<td>Thu</td>
<td>10/22</td>
<td>Chain- and Sheet Silicates,</td>
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<tr>
<td>Thu</td>
<td>10/29</td>
<td>Chain Silicates</td>
<td>Chapter 14</td>
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<tr>
<td>Thu</td>
<td>11/03</td>
<td>Sheet Silicates</td>
<td>Chapter 13</td>
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<tr>
<td>Thu</td>
<td>11/05</td>
<td>Framework Silicates,</td>
<td></td>
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<tr>
<td>Thu</td>
<td>11/12</td>
<td>Optical Mineralogy I</td>
<td>Chapter 7</td>
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<tr>
<td>Thu</td>
<td>11/19</td>
<td>Optical Mineralogy III</td>
<td>Chapter 7</td>
</tr>
<tr>
<td>Thu</td>
<td>11/24</td>
<td>Optical Mineralogy IV</td>
<td>Chapter 7</td>
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<tr>
<td>Tue</td>
<td>11/24</td>
<td>Lab Final Exam, Sections .101 and .103</td>
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<tr>
<td>Thu</td>
<td>12/01</td>
<td>X-Ray Crystallography and Chemical Analysis of Minerals, Ch. 8 and 9</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
You are expected to attend all labs and remain in lab for the entire two-hour period. There are no make-up labs. Mineral identification is part of the lab, but most of your hand sample study may occur after lab hours. You are expected to bring your textbook to the laboratory as a reference for lab activities. Most laboratory instruction cannot be conveniently repeated outside of the scheduled laboratory time. Therefore, regular attendance of the lab sessions is required. Missing more than one lab session without proper documentation will result in a failing grade for this course.

Late Work and Make-up Exams
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! If you know you are going to miss a class or an exam and have a valid excuse, let me know BEFORE the fact, NOT after (by that time I already know…)! Make-up exams cannot be taken after the graded test has been given back to the class. There will be no exceptions!

Chapter Quizzes happen randomly and are used to encourage regular attendance in class. The odds of a Chapter Quiz occurring on a given day are inversely proportional to the number of students present in class that day. Quizzes will consist of a short series of multiple-choice questions to be answered in approximately 5-10 minutes at the end of the class period. Chapter Quizzes may include material covered in previous lectures or in the reading assignment for that day. So please be prepared!

Extra Credit
Depending on our progress throughout the semester, you may have the opportunity to complete more than the minimum number of five chapter quizzes. All additional chapter quizzes will count as extra credit.

Cell Phone Use
The use of cell phones, pagers, MP3 players, headphones and similar electronic devices is not allowed in class. If your cell phone rings during lecture, you will be asked to leave the classroom. Text messaging is not permitted in this class.

Laptop Use
You may use a laptop for note taking during class. However, if laptop use becomes a
distraction to you or others, I will ask you to discontinue the use of your laptop.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **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. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day 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

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

[http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

Statement of Academic Continuity

In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.
The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

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.