Geology 51-315/515: Sedimentary Petrology

Spring 2019 (1 Credit)

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Research Information: https://www.researchgate.net/profile/Eric_Hiatt
More Research: https://uwosh.academia.edu/EricHiatt

General Background: Eric Hiatt's Background

Office hours: 8:30-9:30 Wednesday & Friday; 11:30-12:30 Friday, and by appointment or chance.

Schedule: Thursdays 12:40 AM-4:00 PM, Harrington Hall 313.

Important Dates:
First class meeting: Thursday, Feb. 7.
Last day to drop without Late Drop Appeal: March 20 (here is the form (drop/add card)
Campus Research Day (Celebration of Scholarship): April 25. Plan on attending!
Last day of semester: Friday, May 17.
Graduation: Saturday, May 18.

Things to consider before dropping a course, Information on repeating a course.

Grades:

| Lab exercises, quizzes and participation (see Attendance section below) | 50% |
| Laboratory Notebooks | 50% |

Grade scale: 93% and up = A; 90-92 = A-; 87-89 = B+; 83-86 = B; 80-82 = B-; 77-79 = C+; 73-76 = C; 69-72 = C-; 66-68 = D+; 63-65 = D; 60-62 = D-; <60% = F

Meaning of letter grades:

A = Awesome, outstanding, understands almost all of the required material and completed all assignments, did not miss class. Was engaged, focused, and actively worked through the labs. Reads textbook and other materials, and studies outside class.
B = Better, strong understanding of material. Was engaged and worked through all the labs, reads textbook and studies outside class.
C = Good, understands most of material, but may not have been an active participant.
D = Danger, only understands a little more than half the material. Possibly missed classes, may not have been engaged, and may not have completed assignments. Texting?
F = Failure to understand about less than half of the required material. May have missed classes, may not have been engaged. Texting? Facebook? Other priorities?

Graduate credit: Students enrolled in 515 (graduate credit) must meet with Dr. Hiatt to plan, develop and complete an additional research project. This project will involve a higher level of synthesis than is required of undergraduate students in this course. Graduate grade scale: 93% and up = A; 90-92 = A-; 87-89 = B+; 83-86 = B; 80-82 = B-; 77-79 = C+; 73-76 = C; 69-72 = C-; 68% or less = F.

Equipment required: Hand lens and laboratory notebook (a bound sketchbook with blank pages (8.5 x 11 inches) works best).
Course Objectives: The purpose of this course is to give you a broad understanding of how sedimentary rocks form and how they evolve as they undergo burial. This starts with understanding sediment composition and how this can be used to infer source area characteristics. We will study how, beginning soon after deposition, sediments become lithified. This includes both chemical and physical transformations that lead to major changes in the original petrophysical (porosity and permeability) characteristics of sediments and sedimentary rocks as lithification and diagenesis occur.

Learning Outcomes: Students will recognize how sediments become sedimentary rocks, how porosity forms and evolves and how they can interpret the diagenetic evolution of ancient sedimentary rocks. Students will study and learn the role weathering and sediments play in the global climate system, as well as how energy and other resources come from sedimentary rocks. All of these outcomes will be assessed by based on their observations, interpretations, and reflections in the course notebook that they create.

Course Format: Each class period will consist of approximately 30 minutes of introductory lecture, demonstration, and discussion, and about three hours of laboratory time. The laboratories will involve study of sediment samples, rocks hand samples, and microscope slides. You should keep a lab notebook in which you can take notes and include sketches of the macroscopic and microscopic observations that you make. You will be required to hand in your notebook at the end of the semester.

What is a university education? A university is not like high school, a community college, or a technical school. The purpose of a university is to: 1) discover and develop new knowledge (in science and the arts), and 2) to bring knowledge to society through teaching. You will often hear your experience here here at UW Oshkosh described as a liberal arts
education, which is a term that attempts to encapsulate the university experience, but is, in fact, only part of the larger university experience in science. At a university, you should learn how to problem solve, to think critically, explore fields and areas of interest, learn about cultures, and society -- in addition to learning general aspects and specifics of a range of fundamental topics and specifics within your major. At a university you are given many opportunities to learn from experts in various fields of study, and to explore the world of knowledge -- take advantage of these opportunities!

Attendance: Attendance is required. Please feel free to ask questions at any time; however, disruptive behavior, including talking during lecture & text messaging, is not acceptable and will result in a lower course grade (see also grades section above). Repeated instances of rude, disruptive, or disrespectful behavior will result in a course grade of F and disciplinary action. If you have a valid excuse and must miss a class, contact me BEFORE the class date.

Special Accommodations: Reasonable accommodations will be made for students with disabilities. Please contact Disability Services (424-3100 (voice) or 424-1319 (TTY)) or visit their web site at http://www.uwosh.edu/dean/disabilities.htm for the University’s accommodation request form and documentation requirements. Information related to an individual’s accommodation request will be kept confidential.

Academic Integrity: The Wisconsin Administrative Code states: “Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others academic endeavors.” (§ UWS 14.01) Plagiarism and other forms of academic misconduct are serious offenses with severe penalties. See the University of Wisconsin Oshkosh Academic Misconduct Code for definitions of academic misconduct and details about procedures, sanctions, and other relevant information. Specific questions about the provisions in the Student Discipline Code should be directed to the Dean of Students Office. If you do not understand this statement, please see me as soon as possible.

Here is a list of resources to review writing, grammar, math, chemistry, geology, biology, and other sciences.

Geology 315 Schedule:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic and reading</th>
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<tbody>
<tr>
<td>Feb. 7</td>
<td>Introduction to weathering, geochemical cycles, and the origin of sedimentary rocks (*ch. 1).</td>
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<td>Feb. 14</td>
<td>Carbonate grains: mineralogy and origin (*ch. 4).</td>
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<tr>
<td>Feb. 21</td>
<td>Carbonate grains in thin section; carbonate diagenesis (*ch. 4).</td>
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<tr>
<td>Feb. 28</td>
<td>Carbonate diagenesis: meteoric settings (*ch. 4).</td>
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<tr>
<td>March 7</td>
<td>Carbonate diagenesis: burial settings (*ch. 4).</td>
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<tr>
<td>Sat. March 9</td>
<td><strong>Saturday Field Trip</strong></td>
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<tr>
<td>March 14</td>
<td>Carbonate geochemistry and paragenesis (*ch. 4).</td>
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<tr>
<td>March 21</td>
<td>Chemical and biochemical sedimentary rocks: chert (*ch. 9); phosphorite (*ch. 7); evaporites (*ch. 5).</td>
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<td>March 28</td>
<td><strong>Spring Break March 23-31.</strong></td>
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<tr>
<td>April 4</td>
<td>Introduction to clastic sediments and rocks (*ch. 2).</td>
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<tr>
<td>April 11</td>
<td>Sand and sandstones: framework grains; classification (*ch. 2).</td>
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<td>April 18</td>
<td>Mudrocks; clay mineralogy; classification (*ch. 3); Introduction to X-ray diffraction. Clastic rock diagenesis I: Authigenic minerals (*ch. 2).</td>
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<td>April 25</td>
<td>Clastic rock diagenesis II: Diagenetic minerals (*ch. 2). Interpreting siliciclastic sedimentary rocks: diagenesis and paragenesis. <strong>Celebration of Scholarship</strong> (Reeve Union)</td>
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<td>May 2</td>
<td>X-ray diffraction project.</td>
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<td>May 9</td>
<td>Quantitative analysis of sedimentary rocks.</td>
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<td>May 16</td>
<td>Course wrap-up.</td>
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Additional Resources
(at Polk Library)


Additional Stuff:

1. Students are advised to see the following URL for disclosures about essential consumer protection items required by the Students Right to Know Act of 1990: [https://uwosh.edu/financialaid/consumer-information/](https://uwosh.edu/financialaid/consumer-information/).

2. We explore, we discover interconnections, sedimentary rocks determine whether humans are sustainable, and we are on a quest, but this is not a "University Studies Program" course!