

**GEO143 Course Syllabus
Pacific NW Rocks & Minerals
(4 units)**

Winter 2015 Lecture CRN 58624, Lab CRN 58625
Monday 6:00-10:00 PM

**Chemeketa Community College
Woodburn Campus
120 East Lincoln Street
Woodburn, OR 97071**

Instructor: Jason Robert Patton **email:** jason.patton@chemeketa.edu

Course Website: http://www.science.earthjay.com/?page_id=1516

Course Title: The Geology of Pacific Northwest Rocks and Minerals

Total Instructional Hours, for Course, per Term

33 Lecture Hours = 3 Credit(s)

33 Laboratory Hours = 1 Credit(s)

Prerequisite: None

Term(s) Offered: Fall ___ Winter ___ Spring ___ Summer ___ Offered as needed X

Required Text(s): Tarbuck, Lutgens, Tasa, Essentials of Geology, Prentice-Hall, 12th edition.

Bring your text to class for every class.

Required Supplies: three ring binder for class handouts including blank paper for drawing illustrations and notes during class; colored pencils for making illustrations, calculator

Contact: Please don't hesitate to email me with any questions, comments, or concerns. I welcome any feedback or suggestions. The best way to contact me for any reason is by sending an email directly to my Chemeketa Community College email jason.patton@chemeketa.edu

Course Description

Focuses on the description and identification of the principal rock-forming and economically valuable minerals, and the most important igneous, sedimentary, and metamorphic rocks of the Pacific Northwest. Covers natural processes that form rocks and minerals; relationships of rock types to environments of formation, including plate tectonic settings; classification and laboratory identification of minerals and rocks; important uses of minerals and rocks in society; the rock cycle; and the geologic time scale.

Statewide General Education (AAOT) Outcomes

Upon successful completion of the Science course, students should be able to:

1. Gather, comprehend, and communicate scientific and technical information in order to explore ideas, models, and solutions and generate further questions.
2. Apply scientific and technical modes of inquiry, individually, and collaboratively, to critically evaluate existing or alternative explanations, solve problems, and make evidence-based decisions in an ethical manner.
3. Assess the strengths and weaknesses of scientific studies and critically examine the influence of scientific and technical knowledge on human society and the environment.

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Performance Based Learner Outcomes

Upon successful completion of the course, students should be able to:

1. Describe the science of Geology, including its foundational principles and theories of Earth's formation and plate tectonics.
2. Name the criteria that define a mineral and distinguish the physical properties that vary among minerals.
3. Identify minerals of the Pacific Northwest in hand samples by use of laboratory and field tests.
4. Explain how minerals are classified and assign common minerals to their mineral groups.
5. Define an ore and explain the processes that form them.
6. Recognize the important uses of minerals and rocks in modern society.
7. Define rocks, including the three major types, and explain the rock cycle.
8. Identify igneous rocks in hand samples and explain the formation of volcanic and plutonic rocks, including identification of important volcanic centers in Oregon and Washington.
9. Explain the changes that silicate magmas undergo during crystallization including Bowen's Reaction Series.
10. Identify sedimentary rocks in hand samples and describe the sedimentary processes that formed them. Recognize the importance of stratigraphy and fossils in Oregon's geologic history.
11. Identify metamorphic rocks in hand samples and explain the various processes of metamorphism, including their relationship to the mountains in the Pacific Northwest.
12. Recognize the importance and types of rocks used as decorative and construction materials in Oregon's city and state buildings.

Course Content Outline

- I. Introduction to Geology
- II. Minerals and Mineral Properties
- III. Classification of Minerals
- IV. The Rock Forming Minerals
- V. Economic Minerals and Ore Deposits
- VI. Rocks, the Rock Cycle and Plate Tectonics
- VII. Igneous Rocks and Intrusive Processes
- VIII. Volcanic Igneous Rocks and Processes
- IX. Sedimentary Rocks and Processes
- X. Sedimentary Processes and Environments
- XI. Metamorphic Rocks and Rock Alteration Processes
- XII. Significance and Uses of Rocks and Minerals in Today's Society

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Tentative Class Schedule*

<u>Date</u>	<u>Topic</u>	<u>Readings</u>
Week 1	Lecture 1: Introduction to Geology / Plate Tectonics Activity 1: <u>Geologic Time</u> Lab 1: <u>Plate Tectonics</u>	1 & 2
Week 2	Lecture 2: Matter and Minerals Activity 2: <u>Atoms and Molecules</u> Lab 2: <u>Minerals</u>	3
Week 3	Class Holiday (Martin Luther King Jr.) Library Research Homework: Plate Tectonics	
Week 4	Midterm I Lecture 3: Igneous Rocks and Intrusive Activity / Volcanoes Activity 3: <u>Volcanoes</u> Lab 3: <u>Igneous Rocks</u>	4 & 5
Week 5	Lecture 4: Sedimentary Rocks, Fossils Activity 4: <u>Fossils</u> Lab 4: <u>Sedimentary Rocks</u>	7
Week 6	Lecture 5: Metamorphism and Metamorphic Rocks Activity 5: <u>Metamorphism</u> Lab 5: <u>Metamorphic Rocks</u> <u>Saturday Field Trip: Coast of Oregon</u>	8
Week 7	Class Holiday (President's Birthday) Library Research Homework: Rocks	
Week 8	Midterm II Lecture 6: Economic Geology Activity 6: <u>Fossil Fuels</u> Lab 6: <u>Mining and Exploration</u> <u>Saturday Field Trip: Downtown Salem</u>	bonus#
Week 9	Lecture 7: Rocks and Minerals of Oregon Activity 7: <u>Oregon Geology</u> Lab 7: <u>Geologic Mapping</u>	bonus#

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Academic Honesty

You are encouraged to work together to review notes from lectures, to work on problems from the text, and to formulate ideas for any take-home assignments. However, all work you turn in must be your own independent, original work.

In the event that any work is copied from another student, zero credit will be given to all students involved (regardless of who copied from whom).

Any sources of information used in your written work must be referenced (regardless of whether the material was copied word-for-word). This includes your text book and all internet sources (reference these by including the name and URL). Any work including un-referenced material from another source (regardless of whether it was copied word-for-word) will be given zero credit.

More information is available at:

<http://www.chemeketa.edu/catalog/academichonesty/index.htm>

Academic Misconduct: Cheating, plagiarism, collusion, abuse of resource materials, computer misuse, fabrication or falsification, multiple submissions, complicity in academic misconduct, and/ or bearing false witness will not be tolerated. Violations will be dealt with according to the procedures and sanctions proscribed by the College of the Redwoods. Students caught plagiarizing or cheating on exams will receive an "F" in the course.

College of the Redwoods is committed to equal opportunity in employment, admission to the college, and in the conduct of all of its programs and activities.

Disability

If you have a disability and need an accommodation, please make arrangements to meet with me outside of class. Chemeketa students requesting accommodations must provide documentation of disability and work with the Office for Students with Disabilities.

Disability Services

Bldg. 2, Student Center, 1st floor

503.399.5192

diability@chemeketa.edu

www.chemeketa.edu/earncertdegree/advising/disability

Advising and Counseling

Recent research indicates that community college students who seek out academic advising are more likely to meet their educational goals. Meeting with an advisor can help:

- clarify your academic and life goals

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- choose classes that prepare you for a career
- ensure whether your credits will transfer to another institution

Advising and counseling appointments are available by making an appointment at the Salem campus, 503.399.5120. In addition, you may want to explore My Game Plan, an electronic educational planning system at <http://my.chemeketa.edu>

Instructors are also available to discuss class, degree, and career options. Start planning now.

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Mid-Term/Final Exams: The 2 midterms and final are worth 50 and 100 points each, respectively. The exams are a mix of multiple choice, true/false, short answer, and essay questions based on the lectures, activities, homework, and course reading. Mid-term exams cover the material since the beginning of the course or the last exam, or whatever is most recent. The final is cumulative and will focus on the “big picture” view that is comprehensive of all subjects covered earlier in the course, in addition to the new material covered since the second mid-term.

Participation: Students will be given up to 100 points for participating in class. Full credit will be given if students attend regularly, ask and answer questions in class, and participate in class discussion. When students conduct in behavior that is not respectful (as outlined in the syllabus), they jeopardize their participation grade.

Missing an exam: All make-up exams should be arranged for in advance when possible. In the event of an emergency or sudden illness that prevents you from attending the exam, you must contact me as soon as possible and arrange a time for the exam to be completed before our next regular class time. If you miss an exam (and do not contact me to make it up) or if you arrange a makeup that you do not take, you will receive a zero for that exam.

Course Notes and Illustrations: Each lecture may include handouts (of the presentation for that day) and several on-board illustrations that relate to the specific topic being discussed for that day. You can use the handouts to take notes and your notebook to copy and label any illustrations. You are required to have a three-ring binder containing these handouts and your notes taken during every class. You will turn in your notebooks along with your activities and homework that has been completed through the semester. Your material must be well organized within the notebook. These will be evaluated during the second midterm. Credit of 100 points is given for careful reproduction of the illustrations including any notes, labels, and graphs.

Activities: Each week we will focus on a specific topic and we will use some of the class time to develop these themes. We will have an activity each class. Each activity is due at the end of class and is worth 20 points.

Labs: Each week we will have a lab exercise which is intended to support our learning for the material covered in the lecture, activities, and reading. Each lab is due at the end of class and is worth 20 points.

Library Research: There are two library research assignments that are worth 40 points each. Choose something you are interested in and do some library research about that subject. The first assignment subject matter must involve plate tectonics or earthquakes. The second assignment subject matter must involve rocks. The reports will be typed in Times New Roman font size 12, double spaced, and turned in

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electronically prior to the following class. The reports will be three to five pages. The filename needs to include the course number, the subject, and your last name (e.g. GEO143_earthquakes_patton.docx).

Field Trips: We will have two day-long field trips. These will occur on Saturdays and are listed in the syllabus. These are mandatory. Each student will turn in a field trip report. The reports will be typed in Times New Roman font size 12, double spaced, and turned in electronically prior to the following class. The reports will be three to five pages. There may be additional field trip material to turn in for full credit. The filename needs to include the course number, the subject, and your last name (e.g. GEO143_field_trip_coast_patton.docx). These reports are due prior to the following class and are worth 50 points.

Reading: In this syllabus I provide a list of required reading in the Lutgens et al. text *Essentials of Geology* textbook for each week. The student is expected to read the assignment before class. This reading is essential to your comprehension of the material in this course and will be a key to your success. Periodically I will ask you questions from the reading at the beginning of class, before we have covered the material in lecture. These answers will count towards your activity grade for the day and can count towards the “active attendance grade boost.”

Electronic Presentations: All electronic presentations will be posted to the website for this course. Please use these presentations to review course material and to prepare for your exams and reports.

*** Please note that this document is informational and subject to change.**

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GEO143 Course Expectations

Class will start on time at 6:00 PM. You are responsible to be present for and be attentive to all the material covered in class. If you need to leave the class early, please let me know before the class starts.

This is a college-level science class, and will require a commitment of your time outside of class. This at-home time will enable you to digest the material we cover in class and help when you are asked on the exams to apply these concepts to different problems and applications.

You will spend 8 to 12 hours per week on course material outside of class. You are encouraged to set aside a specific time each week outside of class devoted solely to each course:

- Reviewing lecture notes and in-class exercises each week
- Reading the textbook
- Working on the recommended exercises from the textbook
- Studying for exams

Note that 8 hours per week at home is the average minimum to pass. Some students may require more time at home just to pass; for some in this course that may be enough to get an A. A student who is very attentive in class, asks questions, and takes careful notes will need less at-home time.

Absences: It is extremely difficult to do well in this class without attending all the lectures. I understand there will be an occasional absence due to illness or emergency, however I consider more than two absences per semester excessive. If you do miss a class:

1. Obtain the course material online (PowerPoint slides, extra reading, and handouts). The slides will include information about any homework or in-class exercises that were assigned. Most assignments and handouts referenced by the slides will be in your handouts.
2. Next, try to obtain a copy of lecture notes from a classmate since there are many things we cover that are not spelled out directly on the slides or handouts. This is the most important step.
3. Read the required reading covering the material you missed.
4. After this, feel free to contact me by email with any questions.

Final grade active attendance boost: If your final course grade after rounding to the nearest whole number is within 1 point of a grade transition (C to C+, D to C, A- to A, etc.) I will give you the boost needed to obtain the higher grade if you have actively attended most classes and succeeded in many of the in-class pop quiz questions. More than 2 unexcused absences is considered excessive and will disqualify you from this opportunity. Conduct not in accordance with that outlined below will also prevent you from receiving this bonus.

Computer skills: This class will require computer use outside of class. Activities involving the 4 skills listed below will be included throughout the semester. In addition, you will be expected to check blackboard and your email regularly for announcements.

1. Send and receive email from your Chemeketa Community College email account.

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2. Open a web browser and access a web page if you are given the web address.
3. Access course material (handouts, slides, announcements, etc.).
4. Open Microsoft word (.doc or .docx), Microsoft Excel (.xls or .xlsx) and Adobe .pdf documents to read their contents.

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