

Course Syllabus
Oil and Gas Geology
Red Rocks Community College
(GEY 127-601)
April 22 and April 29, 2017

Room Number: 2573

Meeting Times: Saturday, April 22, 9:00a.m.-4:45p.m. and Saturday, April 29
9:00a.m.-4:45p.m.

CRN#: 33024

Instructor: Jason Eleson, Senior Geologist, Neos GeoSolutions

Email: jason.eleson@rrcc.edu

Office hours: If you need extra help outside of class, please email me so that we can have a conversation over the phone or set up a time to meet on campus.

Required Materials: Please bring a notebook (laptop is ok), pencils and pens to class.

Textbook: None, though handouts of lectures will be available

Pre-requisite: Physical Geology course suggested, but not required

What this course is all about:

This class is intended to give a general overview of oil and gas geology, and instruction is given through in a combination of 1) in-class lectures and student activities/exams, 2) a field trip to visit an outcrop that show rocks that exemplify subsurface drilling targets OR a field trip to an active drill rig on the second Saturday (4/29), and 3) a take home project that will be given on Saturday (4/22) and is due on Saturday (4/29) at 9 pm. The course focuses on both the geologic events that allow oil and gas to be created and trapped in the subsurface, as well as modern exploration and production technologies that allow that gas to be identified, drilled, and produced. For more details about the class, please see curriculum guide later in syllabus.

Course Description:

Introduces basic concepts of oil and gas geology including associated rock types, hydrocarbon formation mechanisms, stratigraphic relationships, permeability, and various types of “traps”. Oil and gas exploration and production methods are also covered. Examples from within Colorado are given.

Standard Competencies:

1. Discuss how coal, shale, and sandstone are formed.

2. Recognize and classify shale, sandstone, and coal and explain how each of these rock types is utilized in the oil and gas industry.
3. Describe oil and gas in the context of sedimentary basin formation and burial history.
4. Explain and identify oil and gas stratigraphic and structural 'traps' in the subsurface.
5. Identify on a map the major sedimentary basins within the lower 48 United States.
6. Identify on a map the major sedimentary basins associated with oil and gas production in Colorado.
7. Describe basic exploration practices used to find oil and gas.
8. Describe basic drilling practices used to extract oil and gas.
9. Explain how oil and gas wells are drilled according to the surface grid method: Township and Range coordinates.
10. Identify the location of at least one oil and gas area in Colorado in the field and/or on a geologic map.
11. Explain the geology and production of at least one oil and gas area in Colorado (e.g. Denver Basin).

Grading: Your grade will be determined based on Attendance and Participation (20%), In-class labs (20%), In-class exams (30%) and a research project you will complete outside of class (30%).

Attendance & Participation: You must be present for the entire class to receive full credit. If you are late and miss an assignment you may not copy someone else's work for credit. For every hour of attendance or participation, 1% will be added to the final grade. If more than 5 cumulative hours are missed, then a failing grade will automatically be given with no chance to make up what was missed.

Class Activities: There will be in-class activities on each class day that will be done on both an individual and group basis. Also, there will be a group activity during the field trip. Notes will be made as to which students are or are not actively engaged in the group labs, and will be reflected in the Attendance and Participation score.

Exams: There will be 2 open-note exams, one exam given at the end of each Saturday class period.

Research Project: You will have 1 week to complete a 3-page typed essay (size 12 font, single spaced), not including the references and figures section. This essay must be loaded on the D2L site by Saturday, April 29, 2017 at 9pm MST in order to receive credit. **NO LATE RESEARCH PROJECTS WILL BE ACCEPTED!** You will be required to choose 1 topic from subset of topics that will be offered during class. Plagiarism won't be tolerated, and will be checked for when I am grading your papers. It is OK cite specific data or

comments from a given source, provided that 1) verbatim comments from external sourced are included in quotation marks or italics to identify that these are not your own words, 2) the source of these comments are provided in a bibliography or references section and 3) that the verbatim verbiage is not longer than 2 sentences AND make up less than 10% of the essay. Points will be awarded based on depth of investigation, ability to descriptive yet concise, critical thinking, references and citations. More detail as described below:

- ❑ *Clarity and Organization (30%): This includes the proper ordering of topics presented in the research paper (Introduction, Body of Report, Conclusions, References Section, Figures Section), as well as coherent arguments, proper use of grammar and punctuation, use of figures to illustrate key points. If I can't figure out the point you are trying to make, I cannot give you a high score!*
- ❑ *Depth of Investigation (30%): Illustrate that original topic has been investigated in sufficient detail to arrive a meaningful conclusion. May include discussing other relevant facts or issues discovered while investigating topic, which are succinctly incorporated into the research report*
- ❑ *Quality of Research (30%): Ability to perform research to address key topics, without relying 100% on internet sites like wikipedia! Books, journals, and periodicals can be accessed from the internet (many of the free!), and personal interviews from subject matter experts are all viable references. Variety of sources is key...using one or two websites will guarantee a low score for quality of research*
- ❑ *Overall effectiveness of paper (10%): Summation of aforementioned criteria. Ability of paper to persuade and inform others on the topic of interest.*

Final Grade

A letter grade will be assigned to the following scale; 90-100%=A, 80-89%=B, 70-79%=C, 60-69%=D, <59%=F. Incomplete grades will not be given. Extra credit is not available for this course.

Desire2Learn: Please get in the habit of frequently checking the course page on "Desire2Learn" (a.k.a. D2L). I will use it on occasion to post course documents (such as this syllabus) and notifications of immediate interest to you. You may also use it to check your grades throughout the semester, and will be uploading your written research project to DropBox. Below are some useful hints for using the software. Computer Services also offers online tutorials, free classes, and a help desk.

1. Go to the following web site: www.rrcc.edu and click on **The Rock** link

2. Login using your S# and self-selected PIN. Click the Desire2Learn link found on the Student Tab

New to **The Rock?**

3. Your username is your student ID (S#) you can find this number on your schedule or bill.
4. Your password is the first six characters of the PIN you created when you registered online. If you did not register online, the default PIN is your birthday (MMDDYY).
5. You will be prompted to enter a new strong password.
6. Click login and enter your S# and new password. Select Desire2Learn from the Student Tab

Note: Our system performs faster using Mozilla Firefox as the browser. If using Internet Explorer, some files may not open up.

HELPDESK: [1-888-800-9198](tel:1-888-800-9198) or <http://help.cccs.edu>

The 24x7 helpdesk is staffed with people trained to answer questions about: - Log-ins - Registration System - Student email - Desire2Learn

Student Conduct and Academic Honesty: Students at RRCC are expected to adhere to the policies for academic integrity and the student conduct code described in the Student Handbook. All students in this class will sign a pledge to be on their honor to do their own work and to follow these policies. There is a zero tolerance policy for any form of academic dishonesty in this course. Disciplinary action will be taken against any student found guilty of academic dishonesty such as cheating or plagiarism. All written work you prepare **MUST** be your own. If your words match those of others, I will assume you copied rather than thinking about the answers yourself. The penalty for being dishonest in this way is far greater than simply getting a wrong answer. If you are unclear whether or not your actions are acceptable, please ask in advance. Any student guilty of any form of academic dishonesty will receive a grade of ZERO for that assignment or exam and will be subject to additional disciplinary action, up to and including failing the course and/or being expelled from the college.

Mandatory Reporting Statement

Our College is committed to preserving a safe and welcoming educational environment for all students. As part of this effort, I have an obligation to report certain issues relating to the health and safety of campus community members. I must report to the appropriate College officials any allegation of discrimination or harassment. Sexual misconduct, which includes sexual harassment, non-consensual sexual contact, non-consensual sexual intercourse, and sexual exploitation, is considered a form of discrimination.

In addition to reporting all discrimination and harassment claims, I must report all allegations of dating violence or domestic violence, child abuse or neglect, and/or credible threats of harm to yourself or others. Such reports may trigger contact from a College official who will want to talk with you

about the incident that you have shared. In almost all cases, it will be your decision whether you wish to speak with that individual. If you would like more information, you may reach the Title IX/EO Coordinator: D. Arnie Oudenhoven, Executive Director of Human Resources/Title IX Administrator, 303-914-6298 or [Arnie Oudenhoven](mailto:arnie.oudenhoven@rrcc.edu) (arnie.oudenhoven@rrcc.edu) Reports to law enforcement can be made at the Red Rocks Campus Police Department behind the Welcome Desk at the Main Entrance or [RRCC Dispatch](mailto:rrpd.dispatch@rrcc.edu) (rrpd.dispatch@rrcc.edu) at 303-914-6394.

If you would like a confidential resource, please contact Deborah Houser, Assistant Director of Human Resources/Deputy Title IX Administrator, 303-914-6224 or [Deborah Houser](mailto:deborah.houser@rrcc.edu) (deborah.houser@rrcc.edu)

Further information may be found on the college [Human Resources website](http://www.rrcc.edu/human-resources/sexual-misconduct): <http://www.rrcc.edu/human-resources/sexual-misconduct>.

ADAAA (Americans with Disabilities Act Amendments Act of 2008) and Section 504 of the Rehabilitation Act of 1973:

Red Rocks Community College is committed to access for students with disabilities. If you are a student with a disability and need assistance or are interested in requesting accommodations, please contact Accessibility Services. Faculty are not obligated to provide accommodations without proper notification by Accessibility Services and accommodations are not retroactive. Students may contact the Access staff by telephone or email to make an intake appointment at 303-914-6733, 720-372-1591(VP) or [Accessibility Services](mailto:access@rrcc.edu) access@rrcc.edu. Accessibility Services is located in Suite 1182 at the Lakewood campus. More information is available at the [Accessibility Services website](http://www.rrcc.edu/accessibility-services): www.rrcc.edu/accessibility-services.

Student Handbook

The [RRCC Student Handbook](http://www.rrcc.edu/student-life/handbook) is your most current source of dates, resources, contacts, and policies: <http://www.rrcc.edu/student-life/handbook>

Tentative Schedule*:

Saturday, April 22, 2017:

Morning:

- Sedimentary Basins: What they are, how they form, and why we care.
- Hydrocarbon System Play Elements: What it takes to make an oil/gas field.
- Reservoir and Source Rocks: Sandstones, Limestones, Shales & Coals
- Class Activity

Lunch break (on your own)

Afternoon:

- Trap and Seals, Hydrocarbon Maturation and Migration
- Oil and Gas Exploration Methods
- Class Activity
- Exploration Mapping Techniques

- Class Activity
- Individual Open-Note Exam #1

Saturday, April 29th, 2017: Closed-toed shoes only! No open toed shoes allowed on the outcrop or drill rig!

Morning:

•9:00am: Arrive at Niobrara Outcrop Exposure OR drill rig (directions to outcrop will be provided at the end of the first class on Saturday, April 22). If you don't show up on time, you will lose credit based on your tardiness per the attendance and participation guidelines.

•If at the Outcrop: Short Lecture, Class Lab, Group Discussion

•If at the Rig: Short Lecture, Group Discussion

Lunch break (on your own)

Afternoon:

•Drive to campus

•Oil and Gas Extraction Techniques in Conventional and Unconventional Reservoirs

•Summary Discussion, Question and Answer Period, Course Evaluation

•Individual Open-Note Exam #2

Important Field Trip Information: This course includes a field trip to outcrop near Boulder, CO. All students must sign a "Student waiver of liability form" prior to the trip. If a trip to a drilling rig is secured, additional waiver forms will need to be signed the day of the trip. Students are responsible for providing their own transportation to and from the field trip locations (directions will be provided). Carpooling is strongly encouraged. Students should bring a lunch, snacks, water, and sunscreen and/or hat. Proper attire includes comfortable clothes for walking and short hikes, and close toed shoes with good tread. Depending on the forecast students may also want to bring a rain jacket or umbrella. No guests will be permitted on the field trip. Additional details, including meeting location and time, will be discussed in class."

*This schedule is tentative and may change prior to the class date. Updates will be provided as needed.