Note: Yellow highlight indicates new policies related to the Public Health Emergency.
Ver. 1.0, updated January 3, 2021 DRAFT 1 JANUARY 3, 2021

ES486 PETROLEUM GEOLOGY (4 Credits, CRN 21328)
POLICIES AND PROCEDURES
Winter Term 2021 - Western Oregon University
Winter Term 2021 - Western Oregon University – **Jan. 4 to March 19** – Hybrid Online

INSTRUCTOR: Dr. S. Taylor
OFFICE HOURS: M, W, F 12-1 P.M.
By appointment

OFFICE: Rm 210 Natural Sciences Bldg
PHONE: (w) 838-8398 (cell) 541-760-9216
FACULTY WEB SITE: www.wou.edu/taylor
E-MAIL: taylors@wou.edu

TAYLOR PERSONAL OFFICE ZOOM MEETING URL:
https://wou-edu.zoom.us/j/8273666289?pwd=bitrNUtBNzNZNUYycFF6NlpzT2ZKUT09

ES486 WEEKLY VIRTUAL CLASS MEETINGS: Tuesdays 2 – 4 PM via Zoom
https://wou-edu.zoom.us/j/82910012189?pwd=NXVCRGx2SGpHV1p1NXVJVzdYQUZBUT09
Meeting ID: 829 1001 2189 Passcode: 329277

ES486 MOODLE SHELL: https://moodle.wou.edu/
ES486 CLASS WEB SITE: https://people.wou.edu/~taylors/es486_petro/ES486_home.html

COURSE DESCRIPTION:

This course provides an introduction to the principles of petroleum geology and methods used for discovery of oil in the subsurface environment. Topics include historical overview, properties of oil and natural gas, geologic environments, generation and migration, reservoir properties, traps and seals, methods of exploration, drilling techniques and extraction, and case studies of classic petroleum producing regions of the world. Laboratory activities include geologic map interpretation, well log analysis, geophysical methods and quantitative approaches to geologic problem solving.

REMOTE ONLINE MODE:

This course will be conducted entirely online in a remote learning mode format. Students will engage internet tools including email, class web site, Moodle learning management system, and web conferencing technology.

As a team, we will be using up to 6 possible modes of remote communication for this term, either separately or together in combination, these include: (1) Personal one-on-one mobile device interactions (e.g. voice calls, text messaging, whatsapp), (2) WOU email system (taylors@wou.edu), (3) ES486 Class Web Site: (https://people.wou.edu/~taylors/es486_petro/ES486_home.html), (4) ES486 Class Moodle Site: (https://moodle.wou.edu), (5) Zoom online conferencing tool and if necessary, (6) U.S. Postal Service and paper mail.

Virtual Class Meetings: The class assignments and labs will be conducted mostly online in asynchronous mode, however ***we will hold one synchronous real-time virtual class meeting per week via Zoom, on Tuesdays from 2 – 4 PM for Winter Term 2021 via Zoom (see link under contact information above)***. Each week, at the listed day and time, I will have a meeting space open for students to attend a virtual class meeting in which I will provide weekly class instructions and lesson overviews; plus answer any questions or assist with assignments. Zoom is a web browser-based tool, click the meeting link posted above to join the meeting; voice, video and text / chat options are available. If you experience difficulty connecting to the Zoom space during meeting time, Plan B give me a call directly on cell phone at 541-760-9216, or email that works as well. I will send out email reminders and virtual meeting links as we progress through the class session. ***Alternative options will be provided to students who are not able to attend the virtual class meeting; recordings will be archived and available.***

Virtual Office Hours: Standing office hours will be held during the posted days / times above using the Zoom

personal meeting tool. The instructor has an account with a virtual room set up that has a static web address with following URL: https://wou-edu.zoom.us/j/8273666289?pwd=bitrNUtBNzNZNUYycFF6NlpzT2ZKUT09 Each week, at the listed day and time, I will have a meeting space open for students to drop in as needed. Enter the URL into a web browser, click link to join meeting, enter your full name and email address in the login box to enter virtual meeting room. Voice, video and text / chat options are available. If you experience difficulty connecting to the Zoom space during office hours, Plan B give me a call directly on cell phone at 541-760-9216, or email anytime, that works as well.

Weekly Planning and Time Management: ES486 is a 4-credit upper division science class originally designed in a format that encompasses 4 hours of lecture and lab time each week. While we are currently delivering the course in a remote, online format; with only 2 hours or real-time synchronous zoom meeting per week, students should anticipate that all meetings, assignments, readings and lab exercises will take a minimum of 4 - 5 hours of personal time per week to successfully complete, and possibly more depending on your individual work flow process. Please plan your weekly work schedules accordingly.

COURSE GOALS AND LEARNING OBJECTIVES:

ES486 learning objectives are aligned with WOU Earth Science program outcomes and select components of the LEAP (Liberal Education and America's Promise; http://aacu.org/leap) learning outcomes developed by the Association of American Colleges and Universities. Upon successful completion of ES486 Petroleum Geology, students will be able to demonstrate minimum competency in the following program areas:

1. Demonstrate knowledge of the geological conditions that lead to the accumulation of petroleum.
2. Apply algebraic, trigonometric, and statistical principles to geologic data collection and analysis.
3. Associate geologic environments with petroleum producing regions of the world.

TEXT AND READING (to be provided by instructor):

Selley and Sonnenberg, 2014, **Elements of Petroleum Geology (3rd Ed.)**: Elsevier, 470 p.
Text readings, handouts, online resources, journal articles and lab exercises will be provided by instructor.

THE PROFESSOR'S PHILOSOPHY ON UPPER DIVISION EARTH SCIENCE / GEOLOGY COURSES:

The upper division Earth Science / Geology course sequence is designed for mature, serious students who are willing to work hard, play hard, have fun, and learn in-depth skills / concepts in a professional academic setting. By default, our student population is very diverse with a wide array of skills, interests, and career goals. The student population ranges from serious Earth Science majors with focused career objectives, to Geology / Earth Science minors to Science Education majors. As such, the professor is charged with serving a diverse array of student interests and career goals in the most professional manner possible. The problem-solving and technical skills acquired via training in the Earth Sciences are highly valuable (and marketable), regardless of career track. Students are expected to actively participate in the learning process and make a significant contribution to the academic integrity of the Earth Science program at Western Oregon University. The ultimate goal of the program is to provide graduates with the academic skills that will enable them to be highly competitive in graduate school or the career marketplace. *GO TEAM!*

CLASS NOTES:

A comprehensive set of instructor class notes are available for download via the internet. The class web site is at **URL** https://people.wou.edu/~taylors/es486_petro/ES486_home.html scroll down the weekly course content list to access class notes and other resources. The class notes are available as Adobe Acrobat Reader files (*.pdf file). The notes and learning resources are in outline form and are very comprehensive.

EVALUATIONS AND EXPECTATIONS:
Student performance will be evaluated on the basis of 2 exams (Mid-term, Final), weekly lab exercises and student presentations. The following is a breakdown of evaluation points, dates, and letter grades:

Mid-Term Exam	100 pts
Final Exam	125 pts
Class Activities / Lab Exercises	120 pts
Student Presentations	20 pts
Weekly Attendance / Participation	50 pts
TOTAL:	415 pts

Final Grading Scale

Percent Range of Total Points	Letter Grade	Percent Range of Total Points	Letter Grade
94-100%	A	77-79%	C+
90-94%	A-	73-76%	C
87-89%	B+	70-72%	C-
83-86%	B	67-69%	D+
80-82%	B-	63-66%	D
		60-62%	D-
		<60%	F

Alternative Grading Method for Winter and Spring Terms 2021: Due to the Public Health Emergency, WOU Administration has approved a grading system whereby any student in a course graded on an A - F basis, will have the option to take the class as Satisfactory/No Credit (S*/NC). This means that each instructor will still grade students using the designated A - F grading mode, and any student that elects this option will have either an S* or an NC recorded on their transcript. S*. WOU generally uses a D- or higher as the cut-off for an S* grade, however this may not apply to all courses in the catalog depending on pre-requisite grade requirements for advancement to higher-level courses. Check with the Registrar's office and your academic advisor for more details and policies regarding this grade option.

Exams: Exams will be administered at evenly spaced increments throughout the term; the final will be 20% comprehensive with test material drawn from throughout the term. Exams will largely consist of essay questions and homework-type problems. *Warning: the exams are very comprehensive and will likely require a full 2+ hours to complete, please plan accordingly*.
SPECIAL NOTE ON EXAM ANSWERS: Never use "etc." in an essay or short answer on an exam. This means nothing in terms of demonstrating your content knowledge. Sketches and drawings help support your written word.

Make-Up Exams: Under no circumstances will make-up exams be administered without prior arrangement (at least five days) and good reason. Please show up on exam day!

Class and Lab Assignments: Class and lab assignments will be worked BOTH during class time and outside of class time each week. You will have lab, reading, and homework assignments that **may** take up to 3 or 4 hours to complete outside of class time, maybe more in some cases, depending on your skill levels and ability. Please plan your schedule accordingly. Due dates for class exercises will be prescribed by the instructor. Late work will be accepted up to 1 week after the due date, but will be automatically assessed a penalty of -20% of the point total.

Due to the volume of students assigned to the instructor each term, he will not be able to grade the lab exercise work in detail. The homework and lab assignments will be checked for completeness, with questions randomly chosen for content and accuracy. Grade points will be assigned on the basis of these two criteria. Exercise answer keys will be posted on the class web site by the instructor. **It is your responsibility to: (1) check your work against the lab / homework keys, (2) make sure you understand how to complete the exercises, (3) find help if you have trouble with lab exercises, and (4) study / learn the exercise skills and material for the exams.**

A Note About Incompletes: No incomplete grades will be given during the last week of class. If you have a problem that warrants an incomplete, make arrangements prior to the last week (no exceptions!!).

Learning Resources and Grade Outcomes: The class knowledge base will be derived from a combination of the following: (1) weekly active engagement with real-time lessons and asynchronous homework completion; (2) independent student reading outside of class; (3) independent student engagement of take-home lab exercises and quantitative problem solving; (4) independent student reading of web resources linked from the class web site; (5) systematic review and memorizing of class notes and ancillary reading materials, as directly linked from class web site and handed out in hard copy during class time; and (6) successful attendance, note taking, and engagement of in-class lectures delivered by the instructor. Instructor lectures are designed as interpretive translations to assist students in understanding the class content and to stay on track with the weekly schedule. Lectures are not intended as the primary knowledge transfer mechanism. Independent student engagement of readings, class notes and lab work outside of class time is the most important pathway to success.

ANOTHER NOTE ABOUT LAB EXERCISES:
Lab exercises will be quantitative in nature with an expectation that students have or will develop skills in the areas of applied algebra and trigonometry. Students will learn computer applications with emphasis on data analysis and problem solving in the Earth sciences. As such, lab exercises will require an additional time commitment outside of the scheduled weekly meeting (i.e. you will have "homework" and "projects" to work on outside of the scheduled class time).

FIELD TRIP(S):
Due to the current public health crisis, no field trips will be planned for winter term 2021.

STUDENT HONOR POLICY:
Plagiarism and cheating will not be tolerated. Cheating includes copying others work and using cheat sheets on exams. However, students are encouraged to interact in small groups during class assignments, i.e. you can freely discuss concepts in all portions of the class, except exams.

ATTENDANCE AND ASSIGNMENT POLICY:
There is a direct correlation between attendance and student performance. Attendance is necessary for students to properly digest intellectual concepts presented in a college classroom format. The in-class assignments are designed to reward students who attend class on a regular basis. Absences with written excuses for medical reasons or university-related functions may be used to arrange make-up work with the instructor. For more information on how to submit a student absence notification request, please contact the Academic Advising and Learning Center at 503-838-8428 or email: https://wou.edu/advising/

Student Absence Notification: If for some reason you are absent due to an extenuating circumstance or medical situation, the instructor may ask you to report the incident through official channels before making exceptions to missed or late work. To complete the Student Absence Notification Form, visit https://wou.edu/advising/ or contact the Student Success and Advising Center at 503-838-8428.

OTHER REQUIRED MATERIALS, SOFTWARE AND HARDWARE:
Students will also need a scientific calculator, ruler, protractor, colored pencils, and frequent access to a personal computer or compatible device connected to the internet. You will be required to use these materials during labs and exams. Given the online mode of delivery students will need access to computer hardware, software (including MS Office, MS Word, MS Excel or alternative compatible products), and a stable internet connection capable of streaming video. MS Office365, including Excel, is available free to all WOU students, for more information connecting visit the following URL: https://wou.edu/tech/remote-access/ You will be required to complete and electronically submit worksheets using MS Word and Adobe Acrobat PDF file formats derived from a Windows 10 Operating System. If you are using Apple IOS / MAC software products, you will be required to import and export to Windows-compatible MS word and Adobe PDF file formats. This process may involve scanning hand-written work with your phone or scanner, and / or converting to a windows-compatible image file format including JPG and PDF. Please plan accordingly, or you will have trouble successfully completing the class.

STUDENT TECHNOLOGY SUPPORT:
A website with detailed information about computer requirements and technology support for WOU students is available at the following URL: https://wou.edu/provost/keep-learning/ In addition, other important phone numbers and web links for WOU technology support are listed below:

Western Oregon University Moodle Support: 1-503-838- 9300 (moodle@wou.edu)
Western Oregon University Computing Solutions (UCS): 1-503-838-8925 (ucshelpdesk@wou.edu)
WOU Remote Access Resource Page: https://wou.edu/tech/remote-access/
WOU Academic Affairs Resource Page: https://wou.edu/provost/instructional-resiliency/

STUDENTS WITH DISABILITIES:
Any student who has a disability that requires accommodation, please make an appointment to see me.

A NOTE ABOUT THE LAST WEEK OF CLASS:
Given that the Oregon University System employs the "quarter method" of academic scheduling, upper division courses are by nature "compressed" with much detailed information to cover in a relatively short period of time. Please note that most upper division text books are geared for courses at universities with a 16 week semester system (i.e. we are truly trying to pack 100 gallons of oil in a 55-gal drum). As such, the 10th week of class is as critical to content coverage as the 1st week. Students should anticipate a full slate of "normal" activities during the last week of class, including lectures, lab exercises, written reports, etc. The class is not over until after the final exam! **Plan your schedule accordingly!**

A NOTE ABOUT LOST OR MISSING WORK:
The instructor will only grade work that is received and physically visible. Any missing work (lab assignments, homework, quiz/test answer sheets) will receive a “0” on the grade sheet. This policy applies to work lost by the student or instructor. If the student demonstrates that the work was turned in, but is missing due to the instructor’s error, then the student will be afforded an opportunity to make up the work and resubmit it for graded credit. Otherwise, the student will not receive credit for lost or missing work.

CHANGE OF SYLLABUS - POP QUIZZES - UNANNOUNCED HOMEWORK ASSIGNMENTS:
The instructor reserves the right to modify the syllabus and class schedule at any time during the term. Students will be notified of such changes in a timely manner. The instructor also reserves the right to administer pop-quizzes and assign unscheduled homework / class assignments at any time. All students will be responsible for completing this work and it will comprise part of the final class grade. Due to the Public Health Emergency, the short-turnaround shift to remote / online education will be a work in progress. Patience and teamwork will be required. The instructor reserves the right to change the syllabus and class structure, as needed, given the dynamic nature of the situation, and the potential for glitches associated with the technology infrastructure. Much time will be provided for students to succeed and adjust to the new learning mode, as the term progresses.

A NOTE ABOUT COMPUTER-BASED AND ONLINE COURSES:

This class will use technology, hardware, software, and the internet. As such, there are endless possibilities for software glitches, system failure, and total confusion. Your patience with lab exercises, assignments, course content, and software / hardware glitches will be greatly appreciated. **Our motto for this class: "expect the worst and hope for the best".**

INSTRUCTOR TIMELINE FOR ONLINE RESPONSE; GRADING EXAMS AND ASSIGNMENTS:

The instructor will respond to emails / messages ASAP and within 24 hours (usually much faster, but understand that it could be up to a day before I respond). On weekends and in the evening, it may take a bit longer, but I will make a point of getting back to you as quickly as possible. The instructor's class grades are typically due to registrar's office the week following the class end date. All exams, lab materials, and assignments submitted by students throughout the term will be graded by that time, however the professor will make an effort to return graded materials within two weeks of the assigned due date. Answer keys and other resources will be posted to assist with students evaluating their work on a weekly basis. ***Grade Reports: I will not be using the Moodle gradebook tool. I will be personally reviewing your work submitted via Moodle upload, grading it manually, and recording scores in my own spreadsheet / gradebook, outside of Moodle. I will send you individual grade updates via email as the session progresses.***

TENTATIVE CLASS SCHEDULE: This outline should be considered tentative at best. The following schedule may be modified as class ideas evolve throughout the term. Readings are from Selley textbook, Elements of Petroleum Geology or as otherwise noted. ***DRAFT 1 UPDATED JAN. 3, 2021***

Week	Dates	Class Content	Assignment Topics	Reading
1	Jan. 4-10	Class Policies / Introduction	Intro Quantitative Methods Review of Sed. Rocks	Ch. 1
	Virtual Zoom Class Begins Tuesday Jan. 5, 2-4 PM			
2	Jan.11-17	Properties of Oil and Natural Gas	Sedimentary Environments	Ch. 2
	Week 1 Assignments Due for Moodle Upload by Monday January 11, 11 PM **Virtual Zoom Class Tuesday Jan. 12, 2-4 PM**			
3	Jan. 18-24	Environments / Petroleum Generation	Fluid and Rock Properties	Ch. 4-5
	Week 2 Assignments Due for Moodle Upload by Monday January 18, 11 PM **Virtual Zoom Class Tuesday Jan. 19, 2-4 PM**			
4	Jan. 25-31	Principles of Fluid Flow and Migration	Lithologic Analysis	Ch. 5
	Week 3 Assignments Due for Moodle Upload by Monday January 25, 11 PM **Virtual Zoom Class Tuesday Jan. 26, 2-4 PM**			
5	Feb. 1-7	Reservoir Properties	Stratigraphic Principles	Ch. 6
	Week 4 Assignments Due for Moodle Upload by Monday February 1, 11 PM **Virtual Zoom Class Tuesday Feb. 2, 2-4 PM**			
6	Feb. 8-14	Petroleum Traps and Seals	Well Log Analysis	Ch. 7
	Week 5 Assignments Due for Moodle Upload by Monday February 8, 11 PM **Virtual Zoom Class Tuesday Feb. 9, 2-4 PM** **Exam 1 – Thursday Feb. 11**			
7	Feb. 15-21	Methods of Exploration	Well Log Analysis	Ch. 3
	Week 6 Assignments Due for Moodle Upload by Monday February 15, 11 PM **Virtual Zoom Class Tuesday Feb. 16, 2-4 PM**			
8	Feb. 22-28	Well Development and Production	Structural Analysis	Instructor Readings
	Week 7 Assignments Due for Moodle Upload by Monday February 22, 11 PM **Virtual Zoom Class Tuesday Feb. 23, 2-4 PM**			
9	March 1-7	Petroleum Systems / Sed. Basins	Basin Analysis	Ch. 8
	Week 8 Assignments Due for Moodle Upload by Monday March 1, 11 PM **Virtual Zoom Class Tuesday March 2, 2-4 PM**			
10	March 8-14	Case Studies / Regional Analysis	Student Presentations	Ch. 8-9; Instructor Readings
	Week 9 Assignments Due for Moodle Upload by Monday March 8, 11 PM **Virtual Zoom Class Tuesday March 9, 2-4 PM**			
11	March 15-19	*Finals Week (check schedule)*		
	Week 10 Assignments Due for Moodle Upload by Monday March 15, 11 PM **Virtual Zoom Class Tuesday March 16, 2-4 PM** **Final Exam – Thursday March 18**			