UTD	**Course**	**GEOS 5V08-029 – PETROLEUM GEOSCIENCE**
	Professor	Lowell Waite
	Term	Fall 2018
	Meetings	MoWe 5:15-6:30pm ROC 2.103

Professor's Contact Information

Office Phone	972-883-5384
Office Location & hours	ROC 1.401, MW 4:30-5:00; or by appointment
Email Address	Lowell.waite@utdallas.edu

General Course Information

Pre-requisites, Co-requisites, & other restrictions	None. This course will be useful to those students interested in a career in the oil and gas industry, or those who wish to learn more about how subsurface oil and gas deposits are formed and located.
Course Description	This course provides a broad overview of topics related to petroleum geology. Included will be an overview of the petroleum industry followed by definition of the petroleum system and detailed discussion of its component parts (source, reservoir, trap, seal, timing/preservation). The class will then focus on the exploration process including land, drilling and completion, and logging. A practical, hands-on correlation and mapping exercise is included. The course will finish with a discussion of unconventional plays. Brief oral presentations are required (see below).
Learning Outcomes	Students will learn the basics of petroleum geology and some key tools and concepts currently employed by industry geoscientists.
Required Texts & Materials	Selley and Sonnenberg (2015) Elements of Petroleum Geology (Third Edition, Academic Press)
Supplementary Materials	None

Important Message: Petroleum geology incredibly interdisciplinary, drawing on concepts from many disciplines. The petroleum industry is vital to the U.S. and global economy and together with emerging renewable energy sources, will remain so for many years. Petroleum geoscience is a challenging and exciting career path. With over 36 years of industry experience, I can enthusiastically attest to both its challenges and rewards – something I hope to impart to students. I assume that all students in this class are extremely familiar with the geologic timescale, copies of which may be accessed here: http://www.geosociety.org/science/timescale/

Grading

30% highest score of 2 midterms; Sept. 19, Oct 17)
40% final exam
(note: all exams are multiple choice, questions from lectures and the book
20% oral presentations
10 % class attendance/participation

- INFO ABOUT ORAL PRESENTATIONS: At the end of each class, I will select a student to present at the start of the following class. When chosen, it will be your job to present to your fellow students a brief (5-min. maximum) summary of one or more subtopics of the previous lecture/topic that interests you. You may choose to present one or two powerpoint slides or use the whiteboard if you choose to present graphics. All graphics must be generated by the student (no cutting and pasting of existing graphics). **Presentations must not exceed 5 minutes**. One or two questions from the instructor or classmates may follow your presentation.

- INFO ABOUT EXAMS & LECTURES: Exams are multiple choice. Most questions will be taken from lectures, but questions from the Selley and Sonnenberg text are also possible. No missed tests can be made up, but one of the two midterm test grades will be dropped. The final exam is mandatory. My lectures supplement the book, but it is important to read the book. Powerpoint lectures will be posted, but students are not permitted to photograph the lecture slides during class. I will hand back exams and go over exams in class but require that all exams be returned to me. Anyone not returning their exam will receive a zero for that test.

CLASS SCHEDULE

Mon Aug 20: **Introduction to Syllabus and Course**

Wed Aug 22: **Introduction to the Petroleum Industry**
Selley and Sonnenberg: Chapter 1 (p. 1-11)

Mon Aug 27: **Physical and Chemical Properties of Petroleum**
Selley and Sonnenberg: Chapter 2 (p. 13-39)

Wed Aug 29: **The Subsurface Environment**
Selley and Sonnenberg: Chapter 4 (p. 153-189)

Mon Sept 3: **NO CLASS (LABOR DAY)**

Wed Sept 5: **Petroleum Systems**
Selley and Sonnenberg: Chapter 5 (p. 239-245 only)

Mon Sept 10: **Petroleum Source Rocks**
Selley and Sonnenberg: Chapter 5 (p. 191-208 only)

Wed Sept 12: **Sedimentary Basins**
Selley and Sonnenberg: Chapter 8 (p. 377-397 only)

Mon Sept 17**: Geochemical methods**
(Guest lecturer: Matt Laughland, Pioneer Natural Resources)

Wed Sept 19: **TEST #1**

Mon Sept 24: **NO CLASS**

Wed Sept 26: **Depositional Systems**

Mon Oct 1: **Sequence Stratigraphy**
Selley and Sonnenberg: Chapter 3 (p. 116-124 only)

Wed Oct 3: **Petroleum Reservoirs**
Selley and Sonnenberg: Chapter 6 (p. 253-302 only)

Mon Oct 8: **Traps and Seals**
Selley and Sonnenberg: Chapter 7 (p. 321-370)

Wed Oct 10: **Classic Petroleum Provinces**

Mon Oct 15: **Mid-Term review (attendance optional)**

Wed Oct 17: **MID-TERM EXAM**

Mon Oct 22: **NO CLASS**

Wed Oct 24: **Exploration Methods – Strategy and Land**

Mon Oct 29: **Exploration Methods - Drilling**
Selley and Sonnenberg: Chapter 3 (p. 41-56 only)

Wed Oct 31: **Exploration Methods – Formation Eval I: Mud Logging & Coring**

Mon Nov 5: **Exploration Methods – Formation Eval II: Wire-line Logs**
Selley and Sonnenberg: Chapter 3 (p. 56-90 only)

Wed Nov 7: **Geophysics**
(Guest lecturer: Kevin Woller, Pioneer Natural Resources)
Selley and Sonnenberg: Chapter 3 (p. 93-115 only)

Mon Nov 12: **Exploration Methods – Geologic Mapping and Contouring**

Wed Nov 14: **Correlation and Mapping Exercise**

Mon Nov 19: **NO CLASS (THANKSGIVING BREAK)**
Wed Nov 21: **NO CLASS (THANKSGIVING BREAK)**

Mon Nov 26: **Correlation and Mapping Exercise (continued)**

Wed Nov 26: **Risk Analysis**
(Guest Lecturer: David Williamson, Monadnock Resources)

Mon Dec 3: **Unconventional Plays**

Wed Dec 5: **Unconventional Plays of the Permian Basin, West Texas**

Mon Dec 10: **Final Review (attendance optional)**

Wed Dec 12: **FINAL EXAM**