GEO 5510/6510 Petroleum Systems I: Petroleum Geology: Fall 2011
1.5 CREDIT HOURS, Prerequisite: GEO 3080/3090 or equivalent; GEO5920/ GEO6920
non-geology students
(Call numbers 13583/9709/9710)

INSTRUCTOR: Dr. Lisa Stright
Contact info: 801-585-5461 or Lisa.Stright@utah.edu
Office Hours: Tuesdays and Thursdays, 12:30-1:30 pm

COURSE DESCRIPTION
Both classical and modern investigative methods are employed in detailed dissection of
(1) petroleum sources (2) large-scaled reservoirs and (3) traps (seals). Further energies
will be directed to detailed examination of reservoirs concerning various pore systems,
and to utilization of diverse subsurface methods. Course will also reveal the necessity
of multiple investigative techniques as imperative for accurate problem solving. Field trip
and occasional visits by industry experts are an integral part of course curriculum. This "applied" course will also deal with some business and engineering aspects of hydrocarbon exploration.

OBJECTIVES OF THIS COURSE:
• To understand the process that lead to the generation of petroleum and to the
accumulation of a viable oil field.
• To gain familiarity with the basic techniques of petroleum exploration and
production.
• To appreciate the economics of hydrocarbon extraction and distribution, the
finite nature of the hydrocarbon resource, and its implications for the future of
our society.

MEETING TIMES: Wednesdays, 3:00-5:20 pm, FASB 234 (Aug. 22 – Oct. 7)
Fieldtrip, Saturday September 17 All Day

COURSE REFERENCES:
Available new and used on Amazon.com and Barnesandnoble.com
It will also be available on reserve at the Library

ADDITIONAL REFERENCES:
Hobson, G. D. and Tiratsoo, E. N., 1985, Introduction to Petroleum Geology, 2nd edition,
Gulf Publishing Company, Houston, TX, 352 p.
Magoon, L. B., and Dow, W. G., eds., 1994, The petroleum system—from source to trap:
AAPG Memoir 60, 655 p.
COURSE EXPECTATIONS
This is a 1.5 credit hour science lecture course for upper level undergraduate students and graduate students. As such, I will not give quizzes to ensure that you are doing the reading. I expect that you will do the necessary reading to master the course material. The suggested reading is listed on the schedule. To get the most out of the course, read the material prior to the lecture.

ATTENDANCE
Attendance is mandatory for success in this class. Because this is only a half semester class and we only meet one day a week, missing a class amounts to missing a significant portion of the course material. Excused absences, such as for University sponsored activities, should be arranged beforehand if possible. If you miss a class because of a legitimate emergency, contact Prof. Stright as soon as possible.

FIELD TRIP
There will be a full, one-day Saturday field trip on September 17 during this course. The focus of this fieldtrip will be to visit an active drilling rig and to visit an outcrop of the formation into which the rig is drilling. We will either be visiting a drilling rig near Rock Springs and visit the outcrops of the Almond. Important: You will need a pair of steel-toed boots to participate in this fieldtrip. Hard hats will be provided.

ONLINE COURSE CONTENT
Class materials, including grades, will be available on the Campus Information System (CIS) website at www.cis.utah.edu. To access course content, enter your login, which is your uNID number, followed by your password. Select GEO 6510 course from your list of accessible courses for fall 2011. Here, you can access a variety of course material including lectures, assignments, class activities, and your grades.

ACCOMMODATION
The University of Utah is committed to providing individuals with disabilities equal access to higher education. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD) (http://disability.utah.edu/). CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services. Students who may require accommodation for this course are encouraged to contact Prof. Stright.
### SCHEDULE (Subject to change):

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<th>Date</th>
<th>Topic</th>
<th>Recommended Reading</th>
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| Aug. 24 (W)| **Part I:** The history, present and future of petroleum production and consumption  
**Part II:** Petroleum Exploration, Drilling and Production | Ch. 1 (1-11), Watch the “End of Oil” Lecture  
Ch. 3.2 (50-83), Ch. 3.3.4-3.3.5 (97-105) |
| Aug. 31 (W)| **Part I:** The subsurface environment  
**Part II:** Petroleum System: Source | Ch. 2 (13-33),  
Ch. 4.1-4.3 (147-170) Ch. 5.1-5.3 (181-214) |
|            | **HW #1: Basin Introduction**                                        |                                                      |
| Sept. 7 (W)| **Part I:** Petroleum System: Migration  
**Part II:** Petroleum System: Reservoir | Ch. 5.4&5.5 (214-229)  
Ch. 6.1-6.7 (239-290) |
|            | **HW #2: Subsurface Environment and Source**                        |                                                      |
| Sept. 14 (W)| **Part I:** Petroleum System: Trap  
**Part II:** Sedimentary Basins and Clastic Depositional Environments | Ch. 7 (307-356)  
Ch. 8 (363-405), Tyler and Finley (1991) |
|            | **HW #3: Charge and Reservoir(s) Description**                     |                                                      |
| Sept. 17 (SA)| **FIELDTRIP**                                                      | Review Ch. 3.1 for fieldtrip                                                        |
| Sept. 21 (W)| **Project Presentations**                                         |                                                      |
|            | (Include depositional environment)                                  |                                                      |
| Sept. 28 (W)| **Part I:** Reservoir Energy/Engineering, Prospect Evaluation and Risk Analysis  
**Part II:** Unconventional Hydrocarbons and hydrofracing | Ch. 6.8-6.9 (291-299), Ch. 10 (443-454),  
Ch. 4.4 (172-176) |
| Oct. 5 (W) | **Guest Lecture: Tom Anderson**  
**Final Paper Due**                                                | Ch. 3.5 (125-131) |
| Oct. 7 (F) | **HW#4: Summary of Dr. Anderson’s Lecture Due**                    |                                                      |
GRADING

Homework Assignments (4)  40%
Class Attendance and Participation  20%
Final project (Presentation + Report)  40%

BASIN HOMEWORKS AND FINAL PROJECT/PRESENTATION

At the beginning of the semester, each of you will be paired with another student (graduate with an undergraduate) and the two of you will collectively pick a basin which you would like to study. It does not have to be in the US. Each week (please note dates on the syllabus) you will compile a 2-3 page overview of the topics that we covered in the previous week’s lecture specific to your basin. You will turn these in independently but may work with your partner to find and discuss the material for the assignment. Guidelines and questions to address will be provided for each assignment. There will be four of these literature review/writing assignments in total. The goal is to apply the knowledge you are learning each week in class to a specific basin.

At the end of the course, you and your teammate will be our class expert in that basin. The two of you will present your results to the class. You will also compile all of your knowledge into a final report. The presentations will include the highlights or the story of the basin and will be no more than 15 minutes long. The final paper should not exceed 10 pages.

CITATIONS

As this is an upper level class, I expect that you would use original, peer-reviewed literature as your sources instead of the internet. The internet is a fine place to being your search to gather a general overview, but track down the original source of the material on the internet in order to ensure its validity. Furthermore, this is excellent practice for your future reports and research papers as the internet is not an acceptable source to cite for these bodies of work.