

Introduction to Petroleum Geology

Spring semester, 2016

Class meets: Th, 6:30 – 9:50 PM, room 4150N

Instructor: Prof. Constantin Cranganu, Office 4415 N, phone: 718-951-5000 ext. 2978,

e-mail: cranganu@brooklyn.cuny.edu

Office hours: by appointment only

Required textbook: none

Recommended textbooks (I will provide you with free copies as pdf files):

- *Petroleum Geoscience: from Sedimentary Environments to Rock Physics*, by Knut Bjørlykke, Springer, 2010
- *Basic Well Log Analysis*, 2nd ed., by George Asquith and Daniel Krygowski, AAPG Methods in Exploration Series, no. 16, 2004.
- *Natural Gas and Petroleum: Production Strategies, Environmental Implications and Future Challenges*, by Constantin **Cranganu**, Editor, Nova Science Publishers, New York, ISBN: 978- 1-62808-535-8540-2, 236 p., 2013

1. There will be a midterm exam, a final exam, and a research project. Grades may be curved so that the following ranges are extended. Numerical scores falling onto the following ranges are guaranteed to receive the indicated letter grades or better. 100-90= A; 89-80= B; 79-70= C; 69-60= D; 59-0=F.
2. Final grades will be based upon the arithmetic average of the examinations and the research project. The weighting will be as follows: midterm exam 40%, final exam 40%, research project 10%, and homework 10%. The final examination will **not** be comprehensive.
3. The research project involves library and internet research on some non-conventional energy sources (tar sands, coal bed methane, gas hydrates, shale oil, shale gas, hydraulic fracturing). Written and oral reports are required. Specific, written instructions will be handed out separately.
4. Class attendance is expected.
5. (a) No incompletes will be given. (b) No makeup exams will be given unless arrangements are made well in advance. If you are unable to show up for an exam due to an emergency you must call the instructor office (718-951-5000 ext.2878) to avoid receiving a grade of zero. If the instructor is not in, you may leave a message with the Geology Department office (718-951-5000 ext. 2880).

6. **Mid-term exam: March 17, 2016 .**
7. **Project presentation: May 12, 2016.**
8. **Final Examination: May 19, 2016.**

Tentative teaching schedule:

Part I (5 weeks): The petroleum system elements; The physical and chemical properties of petroleum; Generation and migration of petroleum; Origin of petroleum: Organic or Inorganic?; Formation of Kerogen; Petroleum Migration; Well drilling and completion; Formation evaluation; Geophysical methods of exploration

Part II (5 weeks): Borehole investigation (Well logging): porosity logs, resistivity logs, borehole imaging, spontaneous potential log, gamma ray log, petrophysical techniques, case studies)

Part III (4 weeks): Petrophysics techniques and interpretation (porosity, permeability, pore throat size, sealing capacity of caprock of CO₂ sequestration repositories, hydraulic fracturing, case studies, research project presentation)

Lateness is not only disruptive, but also disrespectful. Try to be in the classroom BEFORE the class starts. Chronic lateness will not be tolerated: you will be excluded from class activities.

ALL CELLULAR PHONES, I-PODS, I-PADS, TEXT MESSAGING DEVICES, AND PAGERS MUST BE TURNED OFF DURING CLASS HOURS. IF YOU ARE USING ANYONE OF THESE DEVICES DURING CLASS HOURS YOU WILL HAVE YOUR FINAL GRADE REDUCED BY FIVE POINTS.

There will be no extra work for extra-credit. If you miss an exam, you will automatically get a zero.