

**ADVANCED PETROLEUM GEOLOGY AND  
GEOCHEMISTRY  
GEOL 7470  
2008**

**INSTRUCTOR:**

William M. Last (office: 228 Wallace Bldg.; office hours: 1:00-2:30 Monday, Wednesday or by appointment; telephone: 474-8361; E-mail: WM\_Last@UManitoba.ca)

**LABORATORY DEMONSTRATOR:**

Fawn Ginn (office: 349 Wallace Bldg. Office hours: 1-2:30 Monday)

**LECTURES:**

This course is offered in conjunction with GEOL 4520 during the 2008-09 academic session. Lectures are Tuesdays and Thursdays at 10:00-11:30; 243 Wallace Bldg.

**LABORATORY:**

2:30-5:30, Thursdays, 243 Wallace Bldg.

**Course Content**

Petroleum geology is the utilization of geology in the exploration and exploitation of deposits of petroleum and natural gas. The formation of a commercial deposit of petroleum arises from an influx of **petroleum** into a **reservoir** bed which occurs in a **trapping** situation and is large enough to be exploited at a **profit**.

The purpose of this course is to examine each of these four basic components (i.e., *petroleum source rock and migration, trap, reservoir, and economics*) and discuss the role of the **geoscientist** in each. You are already largely familiar with the trap and reservoir components of petroleum geology from previous courses (such as Sedimentology, Stratigraphy, Exploration Seismology, and Structural Geology); therefore these areas will be only briefly reviewed. However, source and migration of petroleum, quantitative use of petrophysical well logs in geological and formation evaluation, and the economics of the exploration scene are very important components often not addressed in other courses. These will be examined in detail in this course. In addition, we will spend some time examining the Canadian and world exploration/exploitation situation.

The **required** textbooks for this course are: "*Elements of Petroleum Geology*" by R. C. Selley (Second Edition, 1998; 470 pp; Academic Press) and "*Basic Well Log Analysis for Geologists*" by G. Asquith and D. Krygowski (Second Edition, 2004; AAPG Methods in Exploration Series Number 16; 244 pp. + CD). Unfortunately, neither text is currently in the U of M library. Please note that there is much confusion about the Asquith text: the original text (1982; which IS in the UM Library)

was reprinted by AAPG several years ago (AAPG MES #4) and sold by them for about twice the cost of the original. Last year AAPG published a completely NEW version (revised and re-written), again with a hefty increase in price. You may want to scour the used or online book stores (especially AAPG) for the original or second edition of this text or perhaps try to depend on the Library copy.

In addition to textbook assignments, outside readings will be assigned to cover specific topics. These outside readings are from material in the University of Manitoba Library System. All reading assignments, both textbook and outside readings, will be made on a weekly basis. Finally, although lectures and assigned readings will be the major vehicles by which the subject material will be conveyed, a variety of audiovisual (video tapes, DVDs) and special demonstrations and exhibits will also be used.

### **Grading:**

The grading scheme for GEOL7470 is:

- Term test (exact date to be announced but usually late-October to early November): 25%
- Final examination: 25%
- Laboratory assignments/tests: 30% (The specific breakdown of this 30% will be discussed in laboratory period.)
- Term Project/Paper: 20%

Tests and exams will cover material from lectures, laboratory assignments and exercises, assigned readings, video tapes, slide presentations, special (guest) lectures, and demonstrations & exhibits. The majority of videotapes used in this course belong to either University of Manitoba or to other organizations. Unfortunately, most of these videotapes *cannot* be borrowed by individual students for study outside of class.

The last date for voluntary withdrawal from the course without academic penalty is *November 12, 2008*. I am instructed by ROASS policy to advise you to read the academic regulations and policies in the 2008-2009 University Undergraduate (and Graduate) Calendar. In particular, be aware of the policies regarding academic dishonesty, including plagiarism and cheating, examination personation, and attendance and debarment. Because some of this course may involve group work, you should also be made aware that group projects are subject to the same rules of academic dishonesty and that group members must ensure that a group project adheres to the principles of academic integrity. In the case of both group and individual assignments, either I or the laboratory demonstrator will provide specific instructions concerning limits of collaboration as explicitly as possible at the time the assignment is made. If you have any questions, ask *before* the assignment or project is undertaken.

### **Policy for Late Assignments**

Some laboratory assignments and projects/evaluations will be due at the end of the lab period. Other lab assignments can be handed in later. The due dates will be announced at the beginning of each lab period. *Late lab assignments, projects, and reports will **not be accepted**.*

### **Term Project/Paper**

The Term Paper/Project is worth 20% of your final grade. I encourage you to use the next few weeks to investigate and do preliminary library research on a subject/topic that you are interested in. At the end of September a fully thought-out written proposal and project outline is required. This project proposal and outline should be at least a page or two in length, and should provide a brief introduction to the topic, a tentative summary of material to be covered or at least the main direction of the paper, and a preliminary reference list. A word of caution: please avoid simply providing a dump of Google Scholar references! This proposal should be given to me in digital form.

The topic of the term paper/project is your choice with the only constraints that the topic must have direct and obvious relevance to petroleum geology and a major emphasis of the paper/project must be on the petroleum geochemical aspects. The project will be evaluated on the basis of (i) scientific content and coverage, (ii) organization, and (iii) presentation quality. Due date for the term project is that of the final exam for this course (which is set by the university; presumably we will know this sometime in October).