GEOLOGY 4436.001 INTRODUCTION TO PETROLEUM GEOLOGY

Department of Physical and Environmental Sciences
Fall, 2016

A. COURSE INFORMATION

Course number/section: GEOL 4436.001
Class meeting time: MWF 09:00 – 09:50 am
Class location: OCNR 255

Lab section and meeting times: GEOL 1403.101 W 03:30-05:20 pm
Lab location: CS 226

Course website: Blackboard  http://Bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Dr. Valeriu Murgulet
Office location: CS 205
Office hours: M 10:00 am – 12:00 pm; Wednesday 10:00 am – 1:00 pm or by appointment
Telephone: (361) 825-6023
e-mail: valeriu.murgulet@tamucc.edu
Appointments: Please email instructor directly for an appointment, or if you have any questions or concerns.

Lab Instructor: TBA

C. COURSE DESCRIPTION

Catalog Course Description
Basic concepts of petroleum geology and techniques used in the exploration and production of hydrocarbon systems. Lectures and lab exercises will cover principles of stratigraphy, sedimentology, hydrocarbon generation, hydrocarbon-trapping mechanisms, reservoir characterization, seismic interpretation, well-log interpretation, and geologic risk analysis.

Extended Course Description
Petroleum Geology is the application of geology (the study of rocks) to the exploration for and production of oil and gas. The elements of petroleum geology consist of the deposition and maturation of a source rock, followed by the migration of petroleum from the source into...
a porous permeable reservoir rock trapped beneath an impermeable seal. This course also describes the science and technology of petroleum exploration and production, the technological advances particularly in horizontal drilling and hydraulic fracturing, the production of gas and oil from shale.

D. PREREQUISITES AND COREQUISITES
GEOL 4411 (may be taken concurrently). Recommended: GEOL 4322 and GEOL 4421 SMTE-0094 Geology Lab Safety Seminar

E. REQUIRED TEXTBOOK, READINGS AND SUPPLIES

Required Textbook

Supplies: pencil, colored pencils, ruler, protractor,

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Upon successful completion of this course, you should be familiar with / demonstrate knowledge of the:
1. major components of petroleum systems,
2. generation and migration of petroleum and the formation of traps and seals,
3. sedimentary basin and tectonic settings associated with petroleum systems,
4. acquire the concepts and methods in petroleum exploration and development.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Petroleum Geology is a very visual and hands-on discipline. In addition to Power Point slides that include many photos depicting geologic concepts and features from around the world, most chapters also contain animations. Be sure to add your own written comments besides the information you are provided. During the laboratory studies, you will be given the opportunity to deepen your understanding of the course material with hands-on exercises.

MAJOR COURSE REQUIREMENTS AND GRADING

The student learning outcomes described in Section F will be measured through the assignments listed below.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Two Exams</td>
<td>30%</td>
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<tr>
<td>Five Lecture Quizzes</td>
<td>10%</td>
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Paper
Labs: assignments (15%) and a final exam (10%)
Comprehensive Final Exam
Total

10%
30%
20%
100%

H. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>TEXTBOOK CHAPTER/ LECTURE TOPIC</th>
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<tbody>
<tr>
<td>08/24</td>
<td>Chapter 1: Introduction. The context of petroleum geology.</td>
</tr>
<tr>
<td>08/29</td>
<td>Chapter 2: The physical and chemical properties of petroleum.</td>
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<tr>
<td>09/05</td>
<td>Labor Day Holiday; Chapter 4: The subsurface environment.</td>
</tr>
<tr>
<td>09/12</td>
<td>Chapter 5: Origin of petroleum. Formation of kerogen.</td>
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<tr>
<td>09/19</td>
<td>Chapter 5: Petroleum migration. The petroleum system.</td>
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<tr>
<td>10/03</td>
<td>Exam 1; Chapter 6: Reservoir continuity. Reservoir characterization. Reserve calculation. Production methods.</td>
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<tr>
<td>10/10</td>
<td>Chapter 7: Distribution of petroleum within a trap. Seals and cap rocks. Structural traps.</td>
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<tr>
<td>10/24</td>
<td>Chapter 8: Sedimentary basins and petroleum systems.</td>
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<tr>
<td>10/31</td>
<td>Chapters 9: Nonconventional petroleum resources.</td>
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<td>11/07</td>
<td>Exam 2; Chapter 3: Well drilling and completion. Formation evaluation.</td>
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<tr>
<td>11/14</td>
<td>Chapter 3: Geophysical methods of exploration.</td>
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<tr>
<td>11/21</td>
<td>Borehole geophysics; Thanksgiving Holiday.</td>
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<tr>
<td>12/05</td>
<td>Conclusions.</td>
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<tr>
<td>12/12</td>
<td>Final Exam (comprehensive): 08:00 am – 10:30 am</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams listed are directly related to the Student Learning Outcomes described in Section F.
I. COURSE POLICIES

Attendance/Tardiness
The grade you will receive for this course is based on your performance on exams, quizzes and exercises and lab assignments.

Late Work and Make-up Exams
Work is due by the stated deadlines. The grade for late work will be reduced by up to 20% for each day it is late. Exams may be made up only in cases of an excused absence and students should contact the instructor in advance to make prior arrangement if possible.

Extra Credit
None

Cell Phone Use
Not allowed.

Laptop Use
Not allowed.

Food in Class
Not allowed.

Missed Exam
Students who must miss an exam should contact the instructor in advance to make arrangements to make up the missed exam. If the absence is unplanned, you should contact the instructor as soon as possible about the situation. Students who miss an exam or pop quiz due to excused absence may make it up. Exam and quiz makeups should be completed as soon as possible.

Participation
Students are encouraged to actively participate in lecture discussion. Generally students who participate more actively are able to learn the material more effectively.

J. COLLEGE AND UNIVERSITY POLICIES

• Academic Integrity (University)
University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic
misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation **WILL NOT** automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage
at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

**K. OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**GENERAL DISCLAIMER**
I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.