CASPER COLLEGE COURSE SYLLABUS
EXTR 2540 Petroleum Refining

Semester/Year: Spring 2016
Lecture Hours: 3  Lab Hours: 0  Credit Hours: 3
Class Time: Moodle  Days: Moodle  Room: Moodle

Instructor’s Name: Ken Kreckel

Instructor's Contact Information: e-mail preferred
Office Phone: 268-3457
Email: kkreckel@caspercollege.edu

Office Hours: Make appointment via email or 307 251 1370

Course Description: This course will cover the process, technology and operations that are necessary for the refinement of petroleum products.

Statement of Prerequisites: EXTR 2530 or permission of instructor

Goal: Upon completion of this course, the student will:
1. Be familiar with the refining process, associated utilities /infrastructure and basic environmental aspects.
2. Demonstrate knowledge of the different methods for producing refined products.
3. Communicate comprehension of the technology used in the refinement of petroleum products.

Outcomes: The student will:
1. List the general characteristics of broad types of crude oil.
2. Demonstrate knowledge of the basics of the distilling process.
3. Demonstrate knowledge of the chemistry of hydrocarbons.
4. Explain and understand the distinction between petroleum distillation vs. cracking and/or “conversion” process units.
5. Demonstrate knowledge of the basic process for refining gasoline.
6. Explain the process for making gasoline and diesel fuel.
7. Demonstrate knowledge of the operation of asphalt, hydrogen, and sulfur plants.
8. List the different types of products that can be refined from petroleum.

In pursing these outcomes, students will:
1. Demonstrate effective oral and written communication
2. Use the scientific method
3. Use appropriate technology and information to conduct research
4. Use quantitative analytical skills to evaluate and process numerical data

Methodology: Moodle will be the main delivery system for this course. The course is divided into weeks [see Moodle page] which correspond to the major topics on the syllabus. Each week will have some combination of the following:
1. Reading assignment
2. Power point presentation [.pdf]
3. Online activity: either a learning site, enrichment, or other relevant site
4. Other activity: problem solving, mapping or chart example, etc.
5. Discussion forum[online]: On some weeks I will post a series of questions on the forum covering the major points for that week. Participation is mandatory and a portion of your grade will be based on the quality of your participation [see Forum Rubric example]
6. Test or quiz periodically

Note: Student feedback is valuable as the instructor uses course evaluations in determining course methodology.

**Evaluation Criteria:** There will be three hours of lecture per week, plus weekly activities. Tests [50-60%] and weekly work equal 100% of the course grade. However it is essential the student complete all assignments in order to perform well on the tests. **Casper College may collect samples of student work demonstrating achievement of the above outcomes. Any personally identifying information will be removed from student work.**

**Required Text, Readings, and Materials:** Moodle. Leffler, William L. Petroleum Refining , 3rd edition;

**Class Policies:** Last Date to Change to Audit Status or to Withdraw with a W Grade: as per college deadlines

**Student Rights and Responsibilities:** Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

**Chain of Command:** If you have any problems with this class, you should first contact the instructor to attempt to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take the matter through the appropriate chain of command starting with the Department Head/Program Director, the Dean, and lastly the Vice President for Academic Affairs.

**Academic Dishonesty:** (Cheating & Plagiarism) Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student Code of Conduct for more information on this topic.

**Official Means of Communication:** Casper College faculty and staff will employ the student's assigned Casper College email account as a primary method of communication. Students are responsible to check their account regularly. This is also where you will find course evaluation links during course evaluation periods.

**ADA Accommodations Policy:** If you need academic accommodations because of a disability, please inform me as soon as possible. See me privately after class, or during my office hours. To request academic accommodations, students must first consult with the college’s Disability Services Counselor located in the Gateway Building, Room 344, (307) 268-2557, bheuer@caspercollege.edu. The Disability Services Counselor is responsible for reviewing documentation provided by students requesting accommodations, determining eligibility for accommodations, and helping students request and use appropriate accommodations.

**Calendar or schedule indicating course content:** See course Moodle page for details and updates
1. Introduction; Evolution of Refining Read Chapter 1
2. Characteristics and chemistry of Petroleum
   Read Chapter 2 & 5
3. Overview of refining
   “review” pdf
4. Distilling
   Read Chapter 3
5. Vacuum Flashing
   Read Chapter 4
6. Cat Cracking
   Read Chapter 6
7. Gas plants within the refinery
   Read Chapter 7
8. Alkyation
   Read Chapter 8
9. Catalytic reforming
   Read Chapter 9
10. Residue reduction
    Read Chapter 10
11. Hydrocracking
    Read Chapter 11
12. Gasoline
    Read Chapter 12
13. Distillates
    Read Chapter 13
14. Asphalt and residual fuels
    Read Chapter 14
15. Hydrogenation, hydrotreating, sulfur plants, isomerization, and dehydrogenation
    Read Chapter 15-16
16. MTBE, ethers, solvents and ethylene plants
    Read Chapter 17-19
17. Refining industry
    Read Chapter 20