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| **APPLIED PETROCHEMICAL TECHNOLOGY**  **CTEC 1401**  **Fall 2011** |
| Course Description |
| Instruction in the basic principles of physics and their application to process facilities. Topics include physical laws and properties and how these relate to the operation of processes. Additional topics will include basic principles of petroleum chemistry, refinery operations, and basic petroleum practical calculations. |
| Prerequisites |
| SCIT 1414 or CHEM 1411 or departmental approval |
| Course Contents |
| Introduction, crude oil characteristics, distilling, flashing, the chemistry of petroleum, catalytic cracking, refinery gas plants, alkylation, catalytic reforming, residue reduction, hydrocracking, gasoline blending, distillate fuels, asphalt and residual fuel, hydrogen, hydrotreating, and sulfur plants, isomerization, solvent recovery of aromatics, ethylene plants, simple and complex refineries, crude oil, condensate, and natural gas liquids, fuel values—heating values.  **Additional End-of-Course Outcomes:** Define terms and principles of applied physics; solve problems using basic laws of physics; and apply principles of physics to the operation of plant equipment. All outcomes are relevant to petroleum refinery operations  **Class schedule and topics is subject to changes by instructor with proper prior notice.**  **YOU MUST MAKE SURE THAT YOU ARE REGISTERED FOR THIS COURSE AND YOUR NAME IS IN THE CLASS ROSTER. THIS IS YOUR RESPONSIBILITY. STUDENTS, WHOSE NAME IS NOT IN THE ROSTER, ARE NOT ALLOWED TO BE IN THE CLASS.**  **In the event you need to drop the class, it is your responsibility to do so.** |
| Instructor Information |
| Dr. John K. Galiotos  E-mail: [john.galiotos@hccs.edu](mailto:john.galiotos@hccs.edu)  Tel. 713-718-5253  Secretary’s phone number: 713-718-5534  Office # 100.1 (Science and Engineering Technology-Energy Institute, Suite 100)  Office hours: M, W 12-2 pm (due to my position as HCC-NE Energy Programs Coordinator, I may have to change my regular office hours with notice) |
| Textbook Information |
| “Petroleum Refining in Non-Technical Language” 4th edition by W. Leffler, ISBN: 978-1-59370-158-1; Penn Well Publishers 2008; required  Recommended (but not required) Texts for additional reading:  “Handbook of Petroleum Refining Processes” by Robert A. Mayers 2nd edition ISBN: 0-07-041796-2 or latest edition-Recommended  Additional hand out will be supplied to the students for lab and internet research. |
| Lab Requirements (if any) |
| Lab demonstrations on will be covered. These include:   * Hydrocarbon safety * Fluidic Catalytic Cracker operations * API and other density calculations * Refinery equipment identification * Refinery Operations   All lab practices will be exercised following all safety rules and regulations at all times.  Labs will take place at COOPER Industries and the Energy Institute, as appropriate and scheduled. |
| Students with Disabilities |
| Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office of their respective college at the beginning of each semester. Faculty is authorized to provide only the accommodations requested by the Disability Support Services Office. For questions, contact Donna Price at 713-718-5165 or the Disability Counselor at your college. To visit the ADA Web site, log on to www.hccs.edu, click Future Students, scroll down the page and click on the words Disability Information.  \* District ADA Coordinator – Donna Price – 713-718-5165  \* Central ADA Counselors – John Reno – 713-718-6164,                                               Martha Scribner – 713-718-6164 \* Northeast ADA Counselor – Kim Ingram – 713-718-8420  \* Northwest ADA Counselor – Mahnaz Kolaini – 713-718-5422  \* Southeast ADA Counselor – Jette Friis – 713-718-7218  \* Southwest ADA Counselor – Dr. Becky Hauri – 713-718-7910  \* Coleman ADA Counselor – Dr. Raj Gupta – 713-718-7631 |
| Academic Honesty |
| Refer to 2010-2011 HCC Student Handbook for policies. |
| Attendance and Withdrawal Policies |
| The lecture portion of this course meets on scheduled day Friday 9 am to 2 pm. Students are expected to attend at least 90% of the classes, since most learning occurs in the classroom and tests are based on material discussed in class.  Note: It is the responsibility of the student to withdraw officially from a course. Administrative drops are at the discretion of the instructor. Failure of a student to officially withdraw by the drop deadline could result in the student receiving a grade of "F" in the course. All students are required to be presence during class sessions. Students must communicate with faculty in cases they need to be absent from a class period. Withdraw policies apply as they described in the HCC policy, rules, and regulations.  Faculty will no longer be able to “withdraw” students on the final semester roll sheets. You must visit with your faculty advisor, a counselor or on-line student services prior to withdrawing (dropping) the class. Also refer to the 2007-2009 HCC Student Handbook. |
| Course Requirements and Grading Policy |
| The material in this course will be presented primarily with lecture, handouts, reading assignments, lab practices, CD videos, pp presentations, and homework.  The major requirement of this course is the completion of all homework assignments and class participation. It is imperative that the student takes complete and accurate lecture notes. Students will be graded by their proficiency on homework assignments, quizzes, exams, project paper, etc. Further, the student will be held responsible for all material discussed in the books and lecture.  **Grading of the Course:**  The course grade is recorded as A (90-100%), B (80-89%), C (70-79%), D (60-69%) or F (less than 60%). In accordance to HCC policy, plus or minus grades are not given.  **Scans Skills**  The following activities will be done:   1. Students will read text assignments and related supplemental materials 2. Students will use computers in their work efforts 3. Students will make oral presentations on topics related to Chemical Laboratory and Petroleum Engineering Technologies 4. Students will do literature search on Internet and libraries 5. Students will carry out various laboratory an d computer related exercises on topics related to Petroleum Engineering Technology 6. Students will write scientific reports 7. Students will learn scientific calculations and interpret scientific data 8. Students will prepare for careers in Petroleum Engineering Technology and related fields. |
| Testing |
| * There will be FOUR (4) tests/assignments administered during the course. Each will cover the material from three chapters at a time. Each will count equally toward the final grade and together will account for 60% of the final grade. * Each student will write an overview of each chapter of the text that will be covered (there will be 16 overviews; two pages each; typed; single space; 12 size letters; Times Roman font). This will be 10% of the grade * There will be 16 homework assignments worth 10% of the final grade as well. |
| Make-up policy |
| One make-up test may be allowed with PRIOR permission of the instructor. |
| Projects, Assignments, Portfolios, Service Learning, Internships, etc. |
| One project is assigned per three students. The students need to follow the template (see attached to the syllabus and copy of it has been mailed to students) to write their paper. Remember, this will count 20% of the grade. |
| Course Goals |
| The goals of this course are to teach students basic principles and applications of current refining processes, the relations of physical and chemical properties of oil products to the over all process orations, current methodologies if refining processes, physical properties data (flow, temperature, pressure, and level) collection and quality of process determination. Additional topics will be: crude oil characteristics, distillation, vacuum flashing, the chemistry of petroleum, cat cracking, refining gas plants, alkylation, catalytic recovery, residue reduction, hydro-cracking, gasoline production, asphalt residue fuel, hydro-treating and hydrogen recovery, MTBE, ethyl plants, and LNG. Other topics that will be covered are: separation processes and sulfur compounds, organic compounds (benzene, toluene, polymers, olefins, paraffins, resins and epoxy material, and solvents. |
| Tentative Course Calendar with Reading Assignments |
| Week 1 Introductions and Evolution of Petroleum Refining  Week 2 Refineries (cont.)  Week 3 Crude Oil Characteristics  Week 4 Distillation  Week 5 Test I  Week 6 Vacuum Flashing and Chemistry of Petroleum  Week 7 Gas Plants and Cat Cracking  Week 8 Alkylation  Week 9 Test II  Week 10 Cat Reforming and Hydro-cracking  Week 11 Isomerization and Residue Reduction  Week 12 Test III  Week 13 Gasoline and Distillate and Residual Fuels  Week 14 Hydrogen, Hydro-treating and Sulfur Plants  Week 15 Asphalts  Week 16 Test IV and Project Due |
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Tutoring and other assistance is available to all students. Library and computer services are currently available in the library of the college; related literature in currently available to all

students in the library.