PRAIRIE VIEW A & M UNIVERSITY
COLLEGE OF ENGINEERING
Roy G. Perry College of Engineering
Department of Chemical Engineering

COURSE SYLLABUS
CHEG 3053 – Chemical Engineering Thermodynamics II
Fall 2019

Instructor:	Dr. Lealon L. Martin Lecturer of Chemical Engineering C.L. Wilson, Room 201F Phone: (936) 261-9411 Mobile: (512) 789-8677 (text or leave voice mail) E-mail: llmartin@pvamu.edu

Class Meeting Time:	TR 2:00 - 3:20 p.m.
Location:	Hilliard Hall - Comm Bldg 123
Office Hours:	T 2:00 – 3:00pm; W 1:00 – 2:00pm; R 11:00am – 12:00pm
Prerequisites:	CHEG 2043 and MATH 2043 each with minimum grade of C
Textbook: Required*	Chemical Engineering Thermodynamics, 8th edition, Smith, Van Ness, Abbott, and Swihart, McGraw-Hill, 2018, ISBN: 978-1-259-69652-7 (preferred); or 7th 0-07-310445-0 (US) Authors website: http://www.mhhe.com/engcs/chemical/smith/
Course Description:	Properties of ideal and nonideal binary and multi-component mixtures. Studies of equilibria for single-and multi-component systems based on methods of corresponding states, equations of state and activity coefficients. Chemical equilibria applied to both homogeneous and heterogeneous systems.
Course Goals:	This course prepares engineering students with the following outcomes. • Knowledge of the 1st and 2nd laws of thermodynamics in energy conservation, power cycles, refrigeration cycles and liquefaction systems • Knowledge of multi-component mixture physical equilibrium, and chemical equilibria in reacting and non-reacting systems • Ability to apply the above to meaningful situations to understand and formulate solutions to complex problems

* See textbook policy elsewhere in this syllabus.

Access to Learning Resources

CHEG Department Computer Lab
Wilson 202
PVAMU Library:
phone: (936) 261-1500;
web: http://www.tamu.edu/pvamu/library/
University Bookstore:
phone: (936) 261-1990;
web: https://www.bkstr.com/Home/10001-10734-1?demoKey=d

Course Objectives

At the end of this course, the student will have achieved and demonstrated the following outcomes.

1. Be able to apply differential and integral calculus and the basic laws of thermodynamics to model or quantitatively describe mass and energy processes.

2. Be able to identify engineering problems through ability to sketch the physical situation, identify the subject area and concepts(s) involved, and identify applicable system of units.

3. Be able to formulate engineering problems by demonstrating the ability to define known and unknown variables, state relevant laws and applicable equations, and list and apply relevant assumptions to the applicable equations to obtain equations specific to the problem.

4. Be able to solve engineering problems by implementing a strategy to solve the problem, show the use of consistent units throughout, and evaluate and interpret the result.

Course Requirements & Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course. Continuous assessment of students' homework assignments and exams will be used to evaluate their competence in CHEG Department student outcome D1 (an ability to identify, formulate, and solve fundamental engineering problems by applying principles of engineering, science, and mathematics) with the performance criteria:

1. Identify fundamental engineering problems. Given a problem, the student is able to:
    - understand the given problem and identify the subject/topic area and concepts involved,
    - convert the problem into a well labeled sketch (such as free body diagram, flow chart, functional
    - block diagram, schematic diagram, and
    - identify the system of units applicable to the problem
2. Formulate/analyze fundamental engineering problems. The student is able to:
    - define the known and the unknown variables in the problem,

- state relevant laws and equations needed for the problem, and
- list and apply assumptions to the relevant laws and equations to obtain the specific equations appropriate to the problem

3. Solve fundamental engineering problems. The student is able to:
    - implement strategy to solve the problem,
    - solve the problem (showing consistent units throughout), and
    - evaluate and interpret the result
4. Formulate and solve fundamental engineering problems by applying principles of mathematics. The student is able to:
    - Formulate and solve fundamental engineering problems using differential and integral calculus

University Rules and Procedures

Disability statement (See Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):
You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures. **Calculators are limited** to basic scientific and graphing functions for exams and quizzes (those with USB or other data exchange port are prohibited).

Forms of academic dishonesty:

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.

2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.

3. Fabrication: use of invented information or falsified research.

4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

5. Use or possession of textbook solution manual. Since these are restricted by the copyright holder to teaching faculty only who are then prohibited from sharing with students, there is *no legitimate way* for a student to have a copy of the solution manual.

Nonacademic misconduct (See Student Handbook)
The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):
Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy:
Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process
Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right

to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Grading Policy:

The overall grade will be calculated based project work, quizzes, 3 partial exams and a final exam. Homework (for practice) will be given but will not be graded. It is up to the student to make best use of practice assignments, which are designed to prepare for exams.

Grade Element	Weight	Actual[1]
Quizzes	15%	
Project[2]	15%	
Exams (3 exams)	45%	
Final Exam	25%	
Overall Grade	100%	
Class Participation, Attendance, SOS survey, etc.[3]	-10%	
Extra Credit[4]		
Adjusted Grade		

1. The Actual column may be used to record your grade elements and your overall grade (calculate as a weighted sum of the elements).
2. At least one project will be assigned, which will probably be team based.
3. The attendance policy notwithstanding, the overall grade is subject to be discounted up to 10% for lack of (1) attendance, (2) punctuality, or (3) participation.
4. Extra credit assignments may be applicable to this course and would consist of extra writing assignments and/or oral presentations. Discuss with instructor.

Letter grades will be assigned based on the numeric value of the adjusted grade (above) using a scale similar to the one below:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	00-59%

Conduct:

Students will conduct themselves in a manner that is respectful to his/her fellow classmates and the instructor at all times.

Notice:

This is a once-a-year course. As one of the five junior level design courses offered once each year in the semester published on the degree plan, in accordance with established procedures of the Roy G. Perry College of Engineering, this course is a prerequisite for CHEG 3043 Separations, which is in turn a prerequisite for CHEG 4473 (now 4472) Senior Design & Professionalism I. Thus, success in this course is key to your having the opportunity to begin the capstone design year, starting with 4472 in next fall and finishing with 4482 in the following spring. Choose well and own the consequences.

Detailed Syllabus and Course Organization*

Week	Lecture Topic with reference	Assignments
Week 1:	Review of syllabus; course overview (table of contents); introduction. Pre-requisite skills inventory. Review of highlights from Chapters 1-5.	Review Ch. 1-5
Week 2:	Review of highlights from Chapters 1-5 (continued) 1st Law, 2nd Law, Ideal Gas Law	
Week 3:	Introduction to Vapor/Liquid Equilibrium (Ch. 10)	Read Chapter 10 Practice Set Ch 10
Week 4:	Introduction to Vapor/Liquid Equilibrium (Ch. 10, continued)	Practice Set Ch 10
Week 5:	Introduction to Vapor/Liquid Equilibrium (Ch. 10, continued)	Exam 1 (covers chapter 10 and practice sets)
Week 6:	Thermodynamic Properties of Fluids (Ch. 6, continued) Maxwell's Relations, Equations of State, Property Relationships	Read Chapter 6 Practice Set Ch 6
Week 7:	Thermodynamic Properties of Fluids (Ch. 6, continued) Residual Properties	Practice Set Ch 6
Week 8:	Thermodynamic Properties of Fluids (Ch. 6, continued) Residual Properties	Exam 2 (covers chapter 6 and practice sets)
Week 9:	Solution Thermodynamics: Theory (Ch. 11)	Read Chapter 11 Practice Set Ch 11
Week 10:	Solution Thermodynamics: Theory (Ch. 11, continued) No class Friday 10 April – Good Friday	Read Chapter 11 Practice Set Ch 11
Week 11:	Solution Thermodynamics: Applications (Ch. 12) and introduce project	Read Chapter 12 Practice Set Ch 12
Week 12:	Solution Thermodynamics: Applications (Ch. 12, continued) and The Gamma/Phi Formulation of VLE (Ch. 14)	Practice Set Ch 12
Week 13:	The Gamma/Phi Formulation of VLE (Ch. 14, continued) and Course Review	Exam 3 (covers chapters 11-12 and practice sets)
Week 14:	Modeling/Project	Project assignment
Week 15:	Last day of class (course review) Study day (no class).	1 lecture (review) Review & Study for Final Exam
Week 16:	Final Exam (comprehensive)	As per official schedule (pending) **Mark your calendar!**

*Note: Instructor reserves the right to modify/change the course syllabus as needed. Students will be provided with a revised syllabus if changes or modifications are made.