

## **CHE 303 – Chemical Engineering Thermodynamics II / Sections 3 & 6 Second Semester 2009 – 2010 (092)**

**Instructor:**

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Office Hours: (10:00-12:00 SMW)

**Textbook:**

Introduction to Chemical Engineering Thermodynamics, 7/e, by J.C. Smith, H.C. Van. Ness, and M.M. Abbot, McGraw-Hill (2001).

**Pre-requisite:**

CHE 203 or ME 203, MATH 202.

**Objective:**

This course is designed to give the chemical engineering students a theoretical basis in the application of basic concepts of thermodynamic. The topics covered include thermodynamic properties of fluids, ideal and non-ideal behavior, phase equilibria, solution thermodynamics, and chemical equilibria.

**Outcomes:**

Upon successful completion of this course, students will be able to:

1. Find thermodynamic information for pure fluids as well as fluid mixtures and use it to perform thermodynamic calculations oriented to the analysis and design of chemical processes [1]
2. Understand the procedures for estimating the thermodynamic properties, such as enthalpies, entropies, Gibbs energies, fugacity coefficients, and activity coefficients of pure fluids as well as fluid mixtures [1, 3].
3. Choose a reasonable model to estimate the physical properties of a substance or a mixture of substances [1, 4].
4. Predict equilibrium compositions of mixtures under phase and chemical-reaction equilibria [1, 3].
5. Evaluate changes in different thermodynamic properties of pure fluids using different techniques such as equations of state (EOS), tables, charts, databases, and software among others [1].

**Grading System:**

Attendance and Participation	5 %
Computer Assignments	5 %
Quizzes	10 %
Two Major Exams	50 %
<u>Final Exam</u>	<u>30 %</u>
Total	100 %

**Course Outline:**

Topic	Chapter	Lectures
Review 1 <sup>st</sup> and 2 <sup>nd</sup> Laws of Thermodynamics	1 to 5	7
Applications of Thermodynamics to Flow Processes	7	3
Production of Power from Heat	8	3
Thermodynamics Properties of Fluids	6	7
Introduction Vapor/Liquid Equilibrium	10	5
Solution Thermodynamics: Theory	11	7
Solution Thermodynamics: Applications	12	5
Chemical-Reaction Equilibria	13	5
Exams and Reviews		3

**1<sup>st</sup> Major Exam:** Tuesday, 33<sup>rd</sup> of March, 2010.

**2<sup>nd</sup> Major Exam:** Sunday, 2<sup>nd</sup> of May, 2010.