Department of Chemical Engineering

Course Syllabus

Course Code & Number	CHE 303		
Course Title	Thermodynamics II		
Credit & Contact Hours	3 Credits; 3 Lectures, 0 Laboratories (3-0-3)		
Instructor	Dr. Muhammad Naveed Khan		
Office Location	Room# 2320		
Instructor's Office Phone	00966 13 720 5178		
Instructor's Email	muhkhan@uhb.edu.sa	**Homepage link**	*https://www.uhb.edu.sa/Pages/MemberDetails.aspx?Param=college&Ref=29&Member=429*
Prerequisites	CHE 203		
Course Description	This course presents the theory and applications of chemical engineering thermodynamics. Topics covered include review 1st and 2nd laws of thermodynamics, equations of state, thermodynamics of flow processes, steam power plants, thermodynamic relations, thermodynamic properties of pure fluids, vapor-liquid equilibria, phase diagrams, solution thermodynamics, thermodynamics properties of fluid mixtures, and chemical-reaction equilibria.		
Course Objectives	i. Apply the first and 2nd law for various applications of chemical engineering thermodynamics. ii. Understand capability of equations of state, thermodynamics of flow processes, steam power plants, thermodynamic relations. iii. Enable students to calculate thermodynamic properties of pure fluids. iv. Enable students to estimate vapor-liquid equilibria, phase diagrams, solution thermodynamics, thermodynamics properties of fluid mixtures, and chemical-reaction equilibria.		
Required Textbook	Richard M Felder, Ronald W Rousseau. and Bullard Lisa G. "Elementary Principles of Chemical Processes" 3rd Edition, John Willey & Sons. J.M. Smith, H. C. Van Ness, M.M. Abbott and M. T. Swihart, "Introduction to Chemical Engineering Thermodynamics," 8th edition, McGraw-Hill Education.		

Grading Scheme

Assessments	Assessments Task	Week due	Proportion of Final Mark (%)
1	Quizzes	fortnightly	15
2	Home-works	fortnightly	15
3	Midterm exam	6	30
4	Final exam	13	40

Course Learning Outcomes & Mapped So's

- Able to understand and employ first and 2nd law of thermodynamic for various applications of chemical engineering thermodynamics. (ABET outcome 1)
- Capable to apply equations of state, thermodynamics of flow processes, steam power plants, thermodynamic relations. (ABET outcome 1)
- Able to calculate thermodynamic properties of pure fluids. (ABET outcome 1)
- Able to estimate vapor-liquid equilibria, phase diagrams, solution thermodynamics, thermodynamics properties of fluid mixtures, and chemical-reaction equilibria. (ABET outcome 1)

Attendance

	Number of unexcused absences			Tot Absences (excused* + unexcused)
	Warning I	Warning II	DN	DN
3 Hours / Week (45 Hours Total)	4 Hours (8%)	8 Hours (17%)	11 Hours (25%)	15 Hours (33%)
Laboratory session	NA	NA	NA	NA

Topics

Weeks	List of Topics
1-4	First and Second Law
	Thermodynamics of flow processes
	steam power plants and Refrigeration
5-8	Equations of state and thermodynamic relations.
	thermodynamic properties of pure fluids
9-11	vapor-liquid equilibria
	Phase equilibria
	solution thermodynamics and Chemical Reaction Equilibria
12	Chemical Reaction Equilibria