

CHEN 2683 - Chemical Engineering Principles 1

Summer 2026 Syllabus, Section 01, CRN 30073,

Credit hours: 3

Instructor

Holly Martin

Professional Qualifications:

PhD., Chemical Engineering, Mississippi State University, 2006

B.S., Chemical Engineering, Mississippi State University, 2002

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Communication Expectations:

Email will usually be responded to within 24 hours; if you have not heard from me after 24 hours, please email me again, as I either missed the email or did not receive the email.

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Course Description

2683. Chemical Engineering Principles 1. Engineering units and dimensions. Hydrostatics. Material balances for non-reacting and reacting processes. Ideal and non-ideal gas relationships. Ideal multi-phase equilibrium calculations. Prereq.: MATH 1571, MATH 1571H or MATH 1585H, CHEM 1515. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	Elementary Principles of Chemical Processes	R.M. Felder, R.W. Rousseau,	978-0-471-68757-3

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Day	Date	Reading(s)	Proposed Topic	Due/To Prepare for Class
Tue	5/12		Unit Conversions – Within Systems and Between Systems; Derived Units; Dimensional Homogeneity	
Wed	5/13		Dimensionless Quantities; Interpolation; Specific Gravity, Mass, and Volume	
Thu	5/14		Flow Rates; Mass, Moles, and Conversions; Average Molecular Weight	
Tue	5/19		Pressure; Process Classification; General Balances	Questions from Week 1 Homework 1
Wed	5/20		Types of Balances; Balances on Single-Unit Processes	

Thu	5/21		Balances on Single-Unit Processes	Homework 2
Tue	5/26		Balances on Multiple-Unit Processes	Questions from Week 2 Homework 3
Wed	5/27		Recycle and By-Pass	
Thu	5/28		Chemical Reaction Stoichiometry	Homework 4
Tue	6/2		Reactions; Extent of Reaction	Questions from Week 3
Wed	6/3	Material from May 12 to May 27	Test 1; Balances on Molecular Species; Yield and Selectivity	TEST 1 - Closed Book In Class
Thu	6/4		Balances on Atomic Species; Product Separation and Recycle	Homework 5
Tue	6/9		Balances on Atomic Species; Purge	Questions from Week 4
Wed	6/10		Combustion Reactions	TEST 1 - Open Book Due
Thu	6/11		Liquid Mixture Densities; Ideal Gases; Non Ideal Gases	Homework 6
Tue	6/16		Equations of State; Compressibility Phase Diagrams; Vapor Pressures	Questions from Week 5
Wed	6/17	Material from May 28 to June 10	Test 2; Gibbs Phase Rule; Single Component Gas-Liquid Systems – Raoult's Law	Homework 7 TEST 2 - Closed Book In Class
Thu	6/18		Multi-Component Gas-Liquid Systems – Raoult's Law; Henry's Law	Homework 8
Tue	6/23		Distillation; Temperature Determination	Questions from Week 6 Homework 10
Wed	6/24		Phase Diagrams for Ternary Systems	TEST 2 - Open Book Due Homework 11
Thu	6/25	Comprehensive with emphasis on Material from June 11 to 24	Final Exam	Questions from Week 7 TEST 3 - Closed Book In Class TEST 3 - Open Book due Sunday

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