

CHE 1013 Chemical Engineering Problem Solving

Required course for ChE Program

Catalog Description: Problem-solving strategies, emphasizing the use of personal computers. Introduction to chemical engineering design problems, including economic analysis and solution by numerical techniques. Programming using VBA for Excel.

Prerequisite: ChE 1002 or permission of instructor.

Corequisite: Math 2014.

Prerequisites by Topic: Engineering calculations; units, dimensions, and unit conversions; derivatives, integrals.

Recent Textbook: *Spreadsheet Tools for Engineers: Excel 2000 Version* by Bryon S. Gottfried, McGraw Hill Companies, Inc. and *Power Programming with VBA/Excel* by Steven C. Chapra, published by Prentice-Hall 2003.

Other Required Materials: none

Course Objectives: By the end of the course the student should be able to demonstrate that they are able to:

1. Conduct an experiment to gather engineering data and analyze this data to draw meaning
2. Use spreadsheets to do basic engineering calculations, graphing and simple statistical analysis including curve-fitting.
3. Write programs with a structured programming language using branching decision structures and looping structures.

Major Topics Covered in the Course: Introduction to Word; memorandum writing; introduction to Excel; formulae, formatting, and plotting; economic analysis; laboratory experiment and design project; interpolation and extrapolation; numerical integration and differentiation; solving equations for single and multiple roots; data fitting and sorting; solving simultaneous linear and nonlinear equations; introduction to Visual Basic for Excel.

Class/Laboratory Schedule: Lecture meets for three 50-minute sessions each week for 14 weeks.

Professional Component Contribution: This course introduces computer programming skills and relates them to mathematics and basic engineering calculations. One design project is assigned in this course.