CENG 210S Introduction to Chemical Engineering

Classroom: ML 107  
Class schedule: MWF 9:00-11:15

Instructor: Michael Loewenberg  
Office: 303 Mason Lab  
Email: michael.loewenberg@yale.edu  
Office hours: Monday afternoon

Objectives:

This is a general introduction to engineering analysis and to chemical engineering principles. Material will include the derivation of governing equations from first principles and the analysis of these equations, including dimensional analysis, scaling arguments, and approximation techniques. The goal of this course is for students to obtain the necessary qualitative knowledge and quantitative skills for mathematically modeling a broad range of problems that arise in engineering, science, and beyond.

Prerequisite: Calculus.

Text:


Exams, homework, and in-class work

4 non-cumulative tests, 20% each  
weekly homework assignments, 20%

Note about problem sets and tests:

Test problems will be drawn from problem sets.
Topics

1. Conservation laws;
   Steady-state and transient systems;
   Lumped and distributed parameters;

2. Fluxes, Constitutive equations.

3. Dimensional analysis;
   Characteristic scales;
   Dimensionless parameters;
   Problem solving.

4. Scaling arguments;
   Estimates;
   Approximation solutions.