

A First Course on Kinetics and Reaction Engineering

Unit 24. Lesson Plan

Before Class

- Provide the redacted slides and the handout to the students and tell them to bring them to class

During Class

- Introduce today's topic and where it fits in the course (Slides 1 and 2)
- Review of Unit 24 (5 to 10 minutes)
 - Slides 3 and 4: go over the key concepts on the slides
- Ask whether the students have any questions from their pre-class preparation and answer them
 - Slide 5
- Learning Activity 24.1 (~20 minutes)
 - Slide 6: Explain to the students that they are going to set up an Excel spreadsheet that plots the heat absorbed and heat generated terms like those shown in the informational reading. They are provided with a template file that contains all the parameters given in this problem statement. They need to enter the code that calculates the values to be plotted.
 - Slide 7: Tell them that once they enter the code that calculates k , n_A heat absorbed and heat generated, their spreadsheet should look as shown. Tell them to enter the code and then to use the resulting spreadsheet to determine how each parameter at the top affects the plot. That is, if you increase one of the parameters, how does the plot change. Tell them they should try to explain why each change occurs. Give them 15 minutes to work
 - Slide 8: Use this slide to go over the results or alternatively, ask them how each parameter affects the plot before showing this slide and use this slide to explain why the parameters have the observed effect.
- Learning Activity 24.2 (~20 minutes)
 - Slide 9: Go over the task and then let them get started. The main purpose of this activity is to make sure they know how to find multiple roots to equation sets using whatever software they are using for the course. Tell them that by having the plot, they should be able to make good guesses for each of the three solutions. Point out that normally they won't have the slide to help them make a first guess.
- Slide 10: Put the material covered in this class into the overall context of the course.

After Class

- Provide the complete slides, the final version of the handout and, optionally, the MATLAB file (or equivalent for the math software your students use) that could be used for activity 4.2 to the students.