

A First Course on Kinetics and Reaction Engineering

Unit 34. Lesson Plan

Before Class

- Provide the redacted slides to the students
- Tell the students to print the worksheet for Activity 34.1 and bring it to class
- Tell the students to print the equations from Unit 17 or, preferably, the AFCoKaRE Exam Handout and bring it to class

During Class

- Introduce today's topic and where it fits in the course
 - Slides 1 and 2
- Review of Unit 34 (5 minutes)
 - Slides 3 and 4
 - point out the similarity to the axial dispersion model
 - emphasize that the axial and radial dispersion coefficients are not equal and point out that if these were actual molecular diffusivities, they would be
 - Slide 5: ask whether the students have any questions from their pre-class preparation and answer them
- Learning Activity 34.1 (~40 minutes)
 - Slides 6 and 7: Read through the problem statement.
 - Slides 8 and 9: Put up the slide with the instructions for the next task, ask if there are any questions, and tell them to start working on the task. Circulate through the class as they work, answering questions and observing. When most have completed the task, have someone describe their answer and discuss, if necessary. Then put up the slide with the results.
 - Slides 9 and 10: Repeat
 - Slides 11 and 11: Repeat
 - Slides 12 and 13: Repeat
 - Slides 14 and 15: Repeat
 - Slides 16 and 17: Repeat
- Summary
 - Slide 18: Put the material covered in this class into the overall context of the course.

After Class

- Make the complete slides available to the students
- Optionally assign the completion of the PFR problem as homework.

Variations

- I don't expect the students to solve the PDEs; if you choose to have them solve the 2-D model equations, present the PFR solution prior to starting the problem, then have them do the 2-D modeling.