A First Course on Kinetics and Reaction Engineering

Unit 21. Lesson Plan

Before Class

- Provide the redacted slides and the handouts 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 21 (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 21.1 (~20 minutes)
  - Slide 6: Put up the slide, explain what students are to do, and tell them to start on the assignment individually; circulate and answer questions as they work. Give them ~10 minutes, then tell them to pair up and compare answers and resolve any differences. Give them ~5 minutes to do so. Then ask for show of hands who thought first question was steady state? transient? If there isn't complete agreement, have them argue it out. If they can't resolve or resolve incorrectly, step in and explain.
  - Slide 7: Summarize the answers. Note a few are tricky: problem is steady state but asks for variation over time. The answer is that the quantity will be constant.
- Learning Activity 21.2 (~20 minutes)
  - Slide 8: Show them the task and have them work in small groups on sketching the CSTR performance; circulate, observe, answer questions as they work. Give them ~10 minutes
  - Slide 9: Walk through the qualitative behavior using the slide; answer questions, if any are posed. When done, ask them to discuss (by groups) how the batch will compare to the CSTR. After ~5 minutes, discuss shape of curve, concluding that it will be similar to the CSTR. Have them vote whether they think CSTR will lie above or below the batch.
  - Slide 10: Show the comparison and walk them through the reasoning.
- Slide 11: Put the material covered in this class into the overall context of the course.

After Class

- Provide the complete slides to the students.