**Problem Set 11 – Due April 24 at Midnight.**

Submit to the course website. Make sure your name is in the file header. Note any collaborations in the header as well. Each student must turn in their own set of solutions.

**Problem 1** – Question 22.2

**Problem 2** – Question 22.18. Plot all four dependent variables versus time. At what time does CB2 = 5?

**Problem 3** – Question 22.19. Let’s assume the time unit is hours. Please plot temp and concentration from 0 to 5 hours. Use subplots. What is the max reactor temperature? When is 95% conversion achieved?

**Problem 4 –** Cylindrical coordinates – Problem 20.17 from textbook.

**Problem 5 -** Integration from formulas

Part 1) Problem 20.6 from textbook. For part (c), use the integral function.

Part 2) Problem 20.8 from textbook – Plot the mass flow rate (mg/min) vs. time (min) curve for this problem. For part (b) use the ‘integral’ and ‘quadgk’ function and compare values.

Group work credit – as we have done throughout the semester, show collaboration on slack by commenting and helping each other in your group.