

**CBE 40455 Chemical Reaction Engineering**  
**Fall 2020**  
**MWF 10:25-11:15**  
**101 Jordan and (live online)**

**Synopsis:**

Our understanding of fluid flow, mass and heat transfer, thermodynamics and chemistry are directed toward developing and understanding procedures and processes to optimally synthesize useful quantities of commodity and specialty chemicals and products.

The topics will include fundamentals of reaction kinetics and catalysis, analysis of various reactor configurations and operating strategies and synthesis pathways for simple and complex molecules. Applications will be drawn from “classic” chemical engineering and the pharmaceutical, materials and food industries. We will also use our “rich” tool set to analyze various living systems and necessarily the COVID-19 epidemic.

**Instructor:**

Mark J. McCready

Offices: 257I Fitzpatrick Hall and 340 McCourtney,

email: [mjm@nd.edu](mailto:mjm@nd.edu)

There will be ~3 Zoom office hour/problem sessions. One will be on Thursday evening, others to be determined.

**Teaching Assistant: ?**

**Textbook:**

*Fundamentals of Chemical Reaction Engineering*, M. E. Davis, R. J. Davis (originally McGraw-Hill 2003). Now available online: <https://authors.library.caltech.edu/25070/1/FundChemReaxEng.pdf> (Feel free to thank the authors for making this excellent text available for free.)

**Course Grading:**

Homework: 10% (1 set/week due on Fridays)

“midsession” hour exams: 40%. (9/4, **10/21 — changed from first version**)

Two final session exams 50% (9/25, 11/20)

**Additional Info:**

It is presumed that all students will follow the: *Undergraduate Academic Code of Honor*.

Some of the “Covid” procedures may still be under development, but the three that could be of most importance:

1. Wear masks as directed. Professor Leighton and I have tested them. If they fit, they work!
2. You will need to sit at one of the seats labeled “Here”. I presume you will settle into a favorite spot and as engineers, you could probably remember on Friday where you sat last Friday. But how about if someone takes on the “leadership” opportunity to remind the instructor to take “pano” shot of the classroom each day!
3. Don’t cross the green line:

