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Reaction Engineering Short Course on Laboratory Reactors

The Dow Chemical Company
Reaction Engineering | Core R&D

Presented by:
Dan Hickman, Ph.D.
Jing Liu, Ph.D.

Developed by the Core R&D Reaction Engineering group of The Dow Chemical Company and designed for chemists and engineers who operate or use data from laboratory reactors, this course contains fundamental reaction engineering knowledge essential for generating high quality data from a laboratory scale reactor.

The course content includes general principles and practical tips for designing and operating laboratory reactors. The bulk of the course content focuses on stirred tank and fixed bed reactors for a variety of reaction systems, including homogeneous liquid phase, gas-liquid, gas-solid, liquid-solid, and gas-liquid-solid systems.

At the end of this course, chemists and engineers will have a better understanding of the critical factors affecting the performance of laboratory scale reactors and the appropriate means for addressing those factors to maximize the probability of generating quality data. During this course, the instructors will introduce a publicly available tool for estimating gradients in heterogeneous catalyst particles and for sizing laboratory fixed bed reactors.

Thursday, June 6 at 8:30AM
322 ISE Lab

This course will be followed by a panel discussion featuring Dr. Hickman, Dr. Liu, and Prof. Cathy Fromen of UD's Department of Chemical and Biomolecular Engineering, as well as a presentation on interviewing skills by Dr. Hickman and Dr. Wasserman, and 1-on-1 meetings with students hosted by Dr. Hickman and Dr. Liu.

This tool is the product of a collaboration between Dow and Purdue University.



INSTRUCTORS



Daniel A. Hickman, Ph. D. is a Fellow in the Engineering and Process Science department of The Dow Chemical Company's Core Research & Development organization.

He received his B.S. in chemical engineering from Iowa State University (1988) and his Ph.D. in chemical engineering from the University of Minnesota (1992) in the field of short contact time catalytic monolith reactors.



Jing Liu, Ph. D., is an Associate Research Scientist in the Engineering and Process Science (E&PS) department of The Dow Chemical Company's Core Research & Development organization.

She received her Ph.D. in chemical engineering from University of Michigan (2015), and her Ph.D. thesis is on characterizing metal/oxygen batteries with multiphase continuum-scale models.



Scott H. Wasserman, Ph.D. is an Associate R&D Director and Intellectual Capital Manager with The Dow Chemical Company.

He also leads Dow's Ph.D. Recruiting team at the University of Delaware, having enabled the hiring of many UD graduates and post-docs in the past approximately 20 years. He earned his B.S. in chemical engineering with Distinction at UD in 1988, and his Ph.D. in chemical engineering at Princeton University in 1993.

COURSE OUTLINE

1. Introduction to fundamental concepts and principles
2. Stirred tank reactors
 - a. For liquid and gas-liquid systems
 - b. For gas-liquid-solid slurry systems
3. Fixed bed reactors
 - a. For gas-solid systems