MICROREACTORS: MATHEMATICAL MODELLING OF HYDRODYNAMICS, HEAT and MASS TRANSFER, DESIGN AND FABRICATION

Overview

In the past two decades throughout the world investigations of micro- and minireactors are actively conducted for their use instead of conventional devices as well as for new processes. Using of micro- and mini technologies cannot only improve the quality of end products, reducing energy and resource consumption, but also increase the manufacturing mobility and the possibility of its rapid readjusting to produce other products. Microreactors can be competitive for the conducting fast reactions, when mass transfer limits a reaction rate, as well as heat transfer, when it is necessary to remove quickly heat from the reactants. It is possible due to unusually high values of heat and mass transfer in microreactors. Another significant advantage of microreactors is a very narrow residence time distribution that can substantially reduce the formation of byproducts in the consecutive reactions. Microreactors can be used for the reactions in mixtures of gases as well as in gas–liquid, liquid–liquid systems and more recently for the synthesis of ionic liquids.

This course is organized in two modules that should be taken together in order to have through knowledge of microreactors. The Module A is meant for exposing the participants with fundamentals of microreactor: introduction of one channel and multichannel microreactor, maldistribution problem in multichannel microreactor, two phase flow regimes, hydrodynamics of Taylor flow and problem solving session. In Module B, the heat and mass transfer mathematical modeling and optimization related with microreactors will be covered.

Course participants will learn fundamentals of microreactors design and fabrication, hydrodynamics, heat and mass transfer these topics through lectures and problem solving sessions. It will also provide knowledge of practical problems and their solutions, through case studies and live projects related to microreactors modeling.

Modules	A: Fundamentals of microreactors: design, fabrication and hydrodynamics: From 20 th – 24 th December 2016 B: Heat and mass transfer, simulation & optimization: From 26 th – 29 th December 2016
Maximum Participants	60 (Final short listing will be done considering equal participation from the industry and academic both)
You Should Attend If	 You are a B.E./B. Tech, M.E./M.Tech., M.Sc., and Ph.D. students from all engineering and science discipline that are interested in learning about microreactors. You are a faculty member from academic institution or a scientists working in research organization and have interest in initiating research on microreactors. You are a practicing engineer working in private organization and your work profile includes closely associated activities.
Fees	The participation fees for taking the course is as follows: Participants from abroad : US \$500 Industry/ Research Organizations: Single Module Rs. 20000 Academic Institutions: Rs. 15000 The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.

The Faculty



Prof. Rufat Abiev is one of Institute Professors of St. Petersburg State Institute of Technology (Technical University) Russia, he is a Head of Department of Optimization of Chemical and Biotechnological

Equipment (since 2008). Dr. Abiev has written approximately more than 200 publications, 5 books, 5 chapters in a "New Handbook of chemist and technologist" (in Russian), 2 chapters in "Engineering Ecology Handbook" (in Russian), more than 50 papers in peerreviewed journals. He also has more than 60 issued or pending patents in Russia and Kazakhstan. His research interests are Process Intensification, Microreactors, Process Simulation, Bubbles and Droplets break up, Heat- and Mass Transfer intensification. Course Location: Indian Institute of Technology-Indore



Dr. Ritunesh Kumar is working as an Associate Professor in the Mechanical Engineering Department of Indian Institute of Technology, Indore. His research interests are heat transfer at micro-scale, desiccant

cooling system and biofuel.

Duration: 20th – 29th December, 2016

Course Coordinator:

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