

Thermo-Fluid Science for Bioengineering & Energy Applications

Overview

Course participants will be introduced to a review of thermal science and fluid dynamics and subsequently get an exposure to application of thermo-fluid sciences in problem solving in the area of Energy as well as Bioengineering applications. Also case studies and assignments will be shared to stimulate research motivation of participants. A large number of engineering problems related to practical applications would be covered. Examples include but are not limited to industrial LASER implementation for PV application for solar energy, optimum design of nuclear waste management system, efficiency enhancement of energy generation in wind and biomass gasification, targeted drug delivery in lungs / blood vessels / tumour cells / internal wounded site, LASER based surgery, effect of LASER surgery on cancer cells and healthy cells, response of cell to LASER and thermo-fluidic environment, hemodynamic flow involving non-Newtonian rheology and realistic pulse profile and designing of innovative diagnostic tools / implants / scaffolds involve the understanding of thermo-fluid sciences in micro and nano confinements. The proposed course would also cover the recent advances in micro/nano-scale transport phenomena.

Objectives

The primary objectives of the course are as follows:

- I. Reviewing to the fundamentals of Fluid Dynamics and Thermal Sciences
- II. Providing exposure to Bioengineering and Energy relevant problems,
- III. Providing exposure to hands-on experience and work-out sessions for thermo-fluidic mechanics
- IV. Stimulate thinking and enhance the overall appreciation of the convergence of science and engineering for societal impact.

Modules	Thermo-fluid Science for Energy and Bioengineering Application: May 27th – June 1st, 2016 Number of participants for the course will be limited to fifty.
You Should Attend If...	<ul style="list-style-type: none"> ▪ you are either a mechanical engineer or associates or research scientist interested in designing or development of technology for advance energy applications for critical environment. ▪ you are a medical professional or biomedical engineer or research scientist interested in designing or development of advance technologies for critical health care application. ▪ you are a student at all levels (B. Tech/MSc/M. Tech/PhD) or faculty from academic institution motivated for involving in multi-disciplinary research and who are interested in learning how to do research on Thermo-fluid science based energy system of Bioengineering.
Fees	<p>The participation fees for taking the course is as follows:</p> <p>Participants from abroad : US \$500 Industry/ Research Organizations: ` Rs. 7000 Faculty from Academic Institutions: ` Rs. 3000 Student from Academic Institutions: Rs. 1000</p> <p>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 subjected to availability.</p>

The Faculty



Prof. Kunal Mitra is from the Mechanical and Biomedical Engineering at Florida Institute of Technology, USA. His research interests include short pulse laser-tissue interaction for biomedical imaging and development of optical tomography system for cancer detection, use of lasers for therapeutic applications, bio-heat transfer modeling, laser interaction at the cellular level using nano-biosensors for understanding of mechanisms, medical device development, development of efficient PV systems, development of nano-material polymer based light weight high-efficiency photovoltaic cells, and laser material processing applications.



Prof. Suman Chakraborty is currently a Professor in the Mechanical Engineering Department and Head of Medical Science & Technology Department of Indian Institute of Technology (IIT) Kharagpur, India. His research interests include Microfluidics and Micro/nano scale transport processes involving bio-medical, bio-technological, chip cooling, and energy related applications. He is recipient of numerous laurels including Bhatnagar Fellowship.



Prof. Himadri Chattopadhyay is from the Mechanical Engineering Department of Jadavpur University, Kolkata, India, who also served as Director of School of BioScience and Engineering of Jadavpur University. His research interests include CFD, Heat Transfer Augmentation, Jet Impingement Turbulence, Energy Efficiency, Materials Processing, Biofluids and FSI in Biomedical engineering.



Prof. Arindam Bit from the Dept. of Biomedical Engineering at National Institute of Technology, Raipur works in Bio-instrumentation and Biofluids. His research interests include bio-fluid mechanics, cellular biomechanics, micro-bioreactor designing, engineering aspects of tissue engineering, bio-micro-fluidics, and cryogenic cell-behaviour.

Course Co-ordinators

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