

Fabrication, Testing and System Integration of Solid Oxide Fuel Cells

Overview

Fuel cells are considered as clean and efficient energy conversion systems which directly convert chemical energy to electrical energy. Solid oxide fuel cells (SOFC) offer the prospect of delivering clean power from conventional, easy-to-store, hydrocarbon fuels at high efficiencies without the concomitant formation of pollutants that are usually associated with the high temperature thermochemical processing of these fuels. SOFCs are still under development; the course aims to cover the practical aspects of conducting experimental research in SOFCs such as synthesis and characterization of electrode and electrolyte materials, design and fabrication of cells, stack development, performance testing and system integration.

This course is organized in the form of eleven hours of lectures and three tutorials spread over five days structured as five modules. The first module consisting of one lecture and one tutorial provides an introduction to fuel cells in general. The second module of four lectures will discuss the structure of solid oxide fuel cells and the materials used to make its key components. The third module discusses the design, fabrication and performance evaluation of a single SOFC cell. The fourth module discusses the design and testing of SOFC stacks. The fifth module discusses post-mortem analysis and modeling issues.

Course participants will learn these topics through lectures, tutorials and assignments. A graded examination will be conducted on the last day of the course.

Course structure	Dates: 27th June, 2016 to 2nd July, 2016 Number of participants for the course will be limited to forty.
You Should Attend If...	<ul style="list-style-type: none">▪ you are an engineer or research scientist working in the development of solid oxide fuel cells▪ you are an advanced level undergraduate student or a post-graduate student specializing in the area of electrochemical energy conversion or development of materials for electrochemical applications▪ you are a student or faculty from academic institution interested in learning how to do experimental research in solid oxide fuel cells
Fees	The participation fees for taking the course is as follows: Students : Rs. 1000/- Academic Institutions: Rs. 5000/- Industry/ Research Organizations: Rs. 10000/- The above fee include all instructional materials. The participants will be provided with accommodation on payment basis subject to availability.

The Faculty



Dr. Aman Dhir is a Teaching Fellow of the department of chemical engineering and Manager of the Centre for Hydrogen and Fuel Cell Research at University of Birmingham, UK. His research interests include polymer electrolyte and solid oxide fuel cells for stationary and transport applications.



Dr. Sreenivas Jayanti is a Professor in the department of chemical engineering at IIT Madras, Chennai. His research interests include clean coal technologies, carbon carbon and sequestration, fuel cells and redox flow batteries.



Dr. Ranjit Bauri is an Associate Professor in the department of metallurgical and materials engineering at IIT Madras, Chennai. His research interests include solid oxide fuel cells, metal matrix composites and materials processing.

Course Co-ordinator

Prof. Sreenivas Jayanti

Phone: (044) 2257 4168

E-mail: sjayanti@iitm.ac.in

<http://www.gian.iitkgp.ac.in>