REGISTRATION FEES

Amount: (inclusive of GST)

Electronic Transfer (preferred mode) Account Name: CEP-STC, IIT Kharagpur Account Number: 95562200002955 Bank Name: SYNDICATE BANK Bank Branch Name: SRIC. IIT KHARAGPUR Branch Code: 9556 IFS Code: SYNB0009556 Bank Address: IIT KHARAGPUR, KHARAGPUR-721 302, PASCHIM MIDINIPUR DIST. (WEST BENGAL), INDIA

Demand Draft

Payments can be made through crossed demand draft drawn in favour of "CEP-STC, IIT Kharagpur" payable at Kharagpur

DEMAND DRAFT DETAILS

Amount	
Bank Name	
Place	
Branch Code	
DD No. & Date	

Declaration

The information provided is true to the best of my knowledge. If selected. I agree to abide by the rules and regulations of the course and shall attend the course for the entire duration without any failure.

Signature of participant

Place:

Date:

Please complete the details above and mail along with registration fee (DD or NEFT receipt) to:

Prof. Anandaroop Bhattacharya Dept. of Mechanical Engineering IIT Kharagpur - 721302



About IIT Kharagpur

History

First in the chain of IITs to be set up by the Government of India. Indian Institute of Technology. Kharagpur started in 1951 in the erstwhile Hijli Detention Camp. It has now blossomed into one of the finest technical institutions in the world, with 585 faculty members in 19 Departments, 9 Centers, and 12 Schools offering 6 M.Sc. programmes, 5 Joint M.Sc. - Ph.D. programmes, 15 B.Tech (Hons.) programmes, 49 joint M.Tech. - Ph.D programmes, 2 M.Tech. programmes (in videoconferencing mode), 1 Master of City Planning programme, 1 Master of Medical Science and Technology programme, 1 LL.B. in Intellectual Property Rights programme, 34 Dual- Degree (both B.Tech and M.Tech) programmes, and 2 Management programmes. It also has MS, Ph.D, and D.Sc. programmes.

Location

Kharagpur is known world over for two landmarks. One, the longest railway platform, and the other, the Indian Institute of Technology, more commonly known as IIT. Situated about 120 km west of Kolkata. Kharagpur can be reached in about 2 hours by train from Howrah railway station of Kolkata or 3 hours by car from Kolkata Airport. Kharagpur is also connected by direct train services to most major cities of the country. The Institute is about 10 minutes drive (5 km) from the Kharagpur railway station. Private taxi, autorickshaw or cycle-rickshaw can be hired to reach the Institute.

Weather

Winter (October to February) is moderate and pleasant (10 to 25 C) in Kharagpur, Summer (March to June) is hot (25 to 40 C) and sometimes humid. Rains are normally confined to the months of June to September.

ELECTRONIC PACKAGING AND DESIGN

Overview

Advanced packaging has permitted the integration of electronics into all manner of products and applications, embedding electronics into every facet of our lives and making them ubiquitous in every engineering system. We are facing an ever-increasing demand in the speed and amount of information we need to transmit, communicate and process. To meet this demand and compete in the international marketplace, we have to constantly seek methods to achieve early adoption of new and emerging technologies, improve quality and reliability, and reduce cost. It is now generally recognized that the performance and price of an electronic system are ultimately limited, not so much by advancements in new device and chip technology, but by our ability to package and manufacture these individual chips into modules, substrates, boards, sub-systems and systems.

Electronic packaging is one of the most critical topics that a practicing engineer in the electronics industry must know about. It is the science and technology that takes the VLSI microchip and transforms it into an usable system/product. The design of an electronic system requires engineering expertise from many different disciplines. In fact, cost, size, weight, manufacturability, quality, reliability, and even commercial success of electronic systems and products depend on holistic system design that require emphasis on mechanical design (based on the principles of mechanics and thermal transport), manufacturing and materials engineering, not just on electrical design.



Objectives of the Course This course is designed to provide a basic knowledge of the technologies and processes required for the packaging and manufacturing of electronic products. The focus of the course will be on the mechanical, materials and manufacturing aspects which are often neglected in the design phase with potentially catastrophic consequences. Students will be exposed to the underlying scientific and technological knowledge-base needed to become proficient builders and users of electronic systems. Course topics will include fundamental principles for packaging active and passive electronic devices; design and testing of components, circuit boards, connectors, and assemblies; thermal, mechanical, electrical and multi-physics modelling; and reliability assessment methods.

Dates Durat



- Engineers, managers/executives and researchers from design and manufacturing companies responsible for building, using and sustaining electronic products.
- Researchers from R&D laboratories working on Electronic Packaging, Design and Manufacturing
- · Graduate students and senior undergraduate students from reputed academic and technical institutions at all levels seeking careers in design and packaging of electronic systems • Faculty from reputed academic and technical institutions
- The course does not have any pre-requisites and is designed to cater to an audience with diverse backgrounds. Some introductory level understanding of Basic Electronics. Mechanics of Solids and Heat Transfer will be helpful.



Course Schedule and Methods

S:	
tion:	

March 8-10, 2018 12 hours

Important Dates

Last date for receiving application: 5th March, 2018

Course Contents

Introduction to Electronic Packaging

- History of Electronic Packaging
- Function of Electronic Packaging
- Constraints of Electronic Packaging
- Surface Mount Technology
- Microelectronics Packaging
- Power Electronics Packaging
- Challenges

Advanced Packaging Technologies

- System on Chip (SoC) vs System in Package (SiP)
- Heterogeneous Integration
- Challenges of Wide Band Gap Devices
- Through Silicon Via and 3D-IC's
- Wafer Level Packaging
- Embedded Die Technology
- Advanced Interconnects

Design and Test

- Traditional Design Flows
- Physical Design
- Electrical and Thermal Design
- Mechanical Design
- Qualification Testing
- Failure Analysis and Reliability Testing

Modelling Tools

- Different Levels of Model Abstraction
- Circuit Simulators
- Finite Element Analysis
- Electrical Modelling
- Thermal Modelling
- Stress Analysis

- Chip-Package-System Interactions
- Multi-Physics Modelling
- Optimisation and Uncertainty Analysis
- Physics of Failure Reliability
- Robustness Predictions
- Case Studies

The Faculty



Prof. Christopher Bailey is Professor of Computational Mechanics and Director of the Computational Mechanics and Reliability Group at the University of Greenwich, UK. He has over 20 years professional experience in electronic packaging (both microelectronics and power electronics) with a particular focus

on design tools and modelling for electrical, thermal and reliability assessments of electronic packaging. In the 2014 UK Research Excellence Framework, over 70% of Professors Bailey's research outputs and impact of his work was rated in the two highest categories of internationally excellent and world leading.

Professor Bailev is considered internationally to be a pioneer in the area of design tools and modelling for electronic packaging and systems. In 2009 his work received the Times Award of Outstanding Engineering Research Team, and his work in knowledge transfer to industry has received numerous awards including best knowledge transfer partnership in 2008. He has published over 250 papers in journals and professional conferences, and his work has received best paper prize at a number of conferences; the most recent being Fraunhofer Direct Digital Manufacturing Conference, Berlin, Germany, 2016. He is a regular invited keynote and short course presenter at international conferences. Apart from being an outstanding academic, Professor Bailey has consulted with over 40 companies worldwide providing both technical expertise and guidance.

Professor Bailey is also affiliated with the IEEE Components, Packaging and Manufacturing Technology (CPMT) Society where is a vice-president, and he is also leading on the codesign, modelling and simulation activities for the Heterogeneous Integration Technology roadmap which is sponsored by a number of IEEE societies as well as other professional societies such as AMSE and SEMI.



Dr. Anandaroop Bhattacharya is an Associate Professor of Mechanical Engineering at IIT Kharagpur. His research interests lie in the areas of electronics cooling, microfluidics, transport in porous media and gas turbine heat transfer. Prior to

joining IIT in 2015, Anandaroop spent 12 years in the industry in USA and India working for Intel, General Motors and General Electric.

Registration Fees

Participants from abroad: USD 500 + 18% GST

Participants from Industry: INR 12,000 + 18% GST

Faculty/Scientists from Research/Academic

Institutions: INR 7,500 +18% GST

Students of Academic Institutions: FREE

Accommodation and food for participants can be

The above fee includes all instructional materials, computer use for tutorials and assignments. laboratory visits, 24-hr free internet facility.

Category

Organiza

arranged on separate payment basis.

Course Co-ordinator

Accommodation

Dr. Anandaroop Bhattacharya Dept. of Mechanical Engg. IIT Kharagpur Kharagpur – 721302, India Phone: +91 3222 - 282946 E-mail: anandaroop@mech.iitkgp.ernet.in



SHORT TERM COURSE Electronic Packaging and Design 8 TH – 10 TH March, 2018
Name
Date of Birth
Gender Male Female
Category Abroad Industry Student
Organization
Address for Correspondence
Phone:
E-mail
Highest Academic Qualification
Domain expertise and Experience (in years)
Accommodation Required (at IIT Kharagpur)

REGISTRATION FORM