

# Design, Packaging and Life Cycle Engineering of Electronic Systems

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## 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. Advanced packaging has been a key enabler for the mobile computing revolution, and has been instrumental in creating wearable electronics, implantable health monitors, autonomous systems, energy efficient transportation systems and novel energy generation technologies that have to thrive in harsh environments. The design of electronic systems 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) and materials engineering, not just on electrical design.

## Objectives

The objective of the course is to introduce students to the principles of mechanical and materials engineering required for designing, manufacturing and sustaining reliable electronic systems. 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 as well as MEMS and microsystems; design of components, circuit boards, connectors, and assemblies; additive and subtractive manufacturing techniques. and assessment of electronics for surviving life cycle profiles containing power cycles, thermal environments, humidity, vibration, shock, and combined stress conditions.

<b>Course</b>	<b>A: Duration : January 4 – January 10, 2018</b> <b>B: Venue : Indian Institute of Technology Kharagpur</b> <b>Number of participants for the course will be limited to 40.</b>
<b>You Should Attend If you are...</b>	<ul style="list-style-type: none"> <li>• Engineers, managers/executives and researchers from design and manufacturing companies responsible for building, using and sustaining electronic systems and products</li> <li>• Researchers from R&amp;D laboratories working on Electronic Packaging, Design and Manufacturing</li> <li>• Graduate students and senior undergraduate students from reputed academic and technical institutions at all levels seeking careers in design and packaging of electronic systems</li> <li>• Faculty from reputed academic and technical institutions</li> </ul>
<b>Fees</b>	The participation fees for taking the course is as follows: <b>Participants from abroad : US \$300</b> <b>Participants from Industry: INR 7,500</b> <b>Faculty or Scientists of Research / Academic Institutions: INR 5,000</b> <b>Students of Academic Institutions: INR 1,000</b> 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 and food on payment basis.

## The Faculty



**Dr. Abhijit Dasgupta**, Jeong H. Kim Professor of Mechanical Engineering at University of Maryland, obtained his Ph.D. in Theoretical & Applied Mechanics from the University of Illinois in Urbana-Champaign in 1988. Since then he has been a professor of Mechanical Engineering at the University of Maryland in College Park, MD. He has over 30 years of expertise in the constitutive behavior and damage mechanics of engineered materials. He is an expert in developing static and dynamic material failure models for reliability assessment, for real-time health monitoring, and for accelerated stress testing. He has many years of experience in advanced computational mechanics for multi-physics, multi-scale, static and dynamic problems with time-dependent material behavior, which arise frequently in “smart” structures, in microelectronic and photonic systems, in MEMS, and in nanotechnologies. His research is funded by an international consortium of leading electronics manufacturers as well as by such government funding agencies as NSF, ARL and ARO. He has published over 300 articles and conference papers; served on editorial boards of three international archival journals; presented over 40 workshops and short courses; helped form research and educational roadmaps for the electronics industry, and provided consulting services to numerous industry leaders. During his professional career, he has received six major awards from industry, academia and government, won 7 best paper awards, and presented 6 keynote/plenary lectures, because of his educational and research contributions in this field. He is an ASME Fellow and a past Chair of the Electronic and Photonics Packaging Division of ASME.



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



## Course Coordinator

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