

Mechanics of Nano-Electronics Packaging

Overview

Reliability of electronics packaging is very important for consumer electronics. Prediction of failure mechanics of electronic packaging requires an understanding of response from nano to micro and continuum scales. Objective of this course is to teach students how to model an electronics package and to simulate the in-situ use conditions of an electronics device using computational mechanics programs in order to predict failure and performance of the electronics device. Students will learn about nano mechanics of materials with an engineering design perspective. In this course students will learn about nonlinear modelling of electronics materials and reliability/failure prediction in electronic packaging when they are subjected to electro-thermal-mechanical and chemical loads. The interface between nano and continuum scales (multi-scale modelling) will also be addressed.

Introduction of state-of-the-art nano electronics packaging technologies. Main mechanics challenges facing state-of-the-art and electronics packaging. Introduction of next generation electronics packaging. Principles of mechanics that is used in the simulation of the response and failure of electronic packaging. The emphasis of the course will be on understanding the multi-scale failure mechanics of electronics packaging at nano scale and to link the nanomechanics to continuum scale (micro and above). Course will also include hands on training on the use of some standard packages to do some simple simulations relevant to electronic packaging..

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| Dates for the Course | 5 th December 2016 to 9 th December 2016 |
| Host Institute | IIT Madras |
| No. of Credits | 1 |
| Maximum No. of Participants | 50 |
| You Should Attend If... | <ul style="list-style-type: none"> ▪ Electronics and Mechanical engineers or research scientist interested in designing next generation electronics devices and/or electronics packaging. ▪ Engineers who want to learn about nano and micro mechanics applications in nano-electronics. ▪ Students and faculty members interested in learning about nano-mechanics research as it relates to nano-electronics packaging. |
| Course Registration Fees | <p>The participation fees for taking the course is as follows: Student Participants: Rs.1000 Faculty Participants: Rs.2500 Government Research Organization Participants: Rs.5000 Industry Participants: Rs.5000</p> <p>The above fee is towards participation in the course, the course material, computer use for tutorials and assignments, and laboratory equipment usage charges.</p> <p>Mode of payment: Demand draft in favour of "Registrar, IIT Madras" payable at Chennai The demand draft is to be sent to the Course Coordinator at the address given below.</p> |
| Accommodation | The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Request for hostel accommodation may be submitted through the link: http://hosteldine.iitm.ac.in/iitmhostel |

Course Faculty



Prof. Cemal Basaran is the Director of the Electronic Packaging Laboratory at University at Buffalo, The State University of New York. His research interests include electronics packaging reliability modeling and testing under thermo-mechanical-electrical loads. He has published 130 + peer reviewed archival journal papers in the topic. He has served as Associate Editor of 11 journals including IEEE Transactions on Components, Packaging and Manufacturing Technology , ASME Journal of Electronic Packaging and ASCE Journal of Nanomechanics and Micromechanics. More info available at

<http://www.packaging.buffalo.edu/>



Prof. C. Lakshmana Rao is a Professor in the Department of Applied Mechanics at IIT Madras. His research interests include Modeling of piezopolymeric sensors, Impact and blast resistance and Fracture modeling in materials. He has published 40+ peer reviewed archived journal papers on his research work. He has authored text books on 'Engineering Mechanics – Statics and Dynamics', 'Modeling of Engineering Materials' and 'Applied Impact Mechanics'. He is currently the Secretary of 'Indian Society of Applied Mechanics'.

<https://home.iitm.ac.in/lakshman/>

Course Coordinator

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URL: [http:// home.iitm.ac.in/lakshman/gian](http://home.iitm.ac.in/lakshman/gian)