

Thermal Management of Electronics

Overview

Thermal management is essential in electronics, as it improves reliability and enhances performance by removing heat generated by the devices. From a reliability and performance point of view, thermal management needs to be carried out for every electronic device which dissipates heat. This is essential for modern electronics, for as they consume more power, they also generate more heat. This course will provide insights into different Thermal Management techniques and delve deeper into the use of microchannels for the same. The objective of the course is to provide an overview of the importance of thermal management of electronics and the range of options available to solve thermal issues; and to develop the skills to analyze and solve electronics cooling problems. Learning Outcomes

At the conclusion of this course, the students are expected to:

1. Understand how and where heat is generated in electronics
2. Identify the various options available for thermal management of electronics
3. Apply the fundamental heat transfer and fluid flow equations to solve electronics cooling problems

Modules	<p>A: Introduction, Heat generation in electronics, Temperature Measurements& Jedec Standards : October 30, 2017</p> <p>B: TIM & Spreading Resistance, Air/Liquid Cooling : October 31, 2017</p> <p>C: Two-phase Cooling, Thermoelectric Coolers, Data center HVAC : November 01, 2017</p> <p>D: Flow boiling heat transfer in microchannels : November 02, 2017</p> <p>E: Use of nanofluids and other applications : November 03, 2017</p> <p>Number of participants for the course will be limited to Fifty (50)</p>
You Should Attend If...	<ul style="list-style-type: none"> ▪ Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories. ▪ Students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.
Fees	<p>For Students from India:</p> <p style="padding-left: 40px;">Participation without grading: Rs. 500/-</p> <p style="padding-left: 40px;">Participation with grading: Rs. 1000/-</p> <p>For Faculty/Scientists/Industry from India</p> <p style="padding-left: 40px;">Faculty (Internal & External) & Scientists from R&D Labs: Rs. 2000/-</p> <p style="padding-left: 40px;">Persons working in Industry / Consultancy firms : Rs. 4000/-</p> <p>For Participants from abroad</p> <p style="padding-left: 40px;">Students : USD 50</p> <p style="padding-left: 40px;">Faculty/Scientists/Persons from Industry & Consultancy firms : USD 100</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.</p>

The Faculty

1. Dr. Poh Seng Lee, Department of Mechanical Engineering, NUS, Singapore (Foreign Faculty)

Dr. PS Lee is currently Associate Professor in the Department of Mechanical Engineering at NUS, Singapore. He is also the Assistant Dean, Office of Vice-Dean of Research & Technology and Deputy Director, Centre for Energy Research & Technology, Faculty of Engineering, National University of Singapore. His research interests include microfluidics and microscale heat transfer, high performance thermal management techniques (in particular microchannel single- and two-phase cooling) and hybrid solar energy harvesting systems. His work were published in top international journals and widely cited. One of his papers won the International Journal of Heat and Mass Transfer Most Cited Papers Award for 2005-2008. In addition, he developed various novel and effective passive techniques for enhancing the heat transfer performance of microchannel heat sinks and mitigating the critical issues of hotspots and large temperature gradients in electronics devices and holds 2 US patents related to these efforts. He is also the recipient of various awards including the 2009 Tan Kah Kee Young Inventors Award, 2011 Asia Pacific Clean Energy Summit Top 10 Defence Energy Technology Solutions Award and the 2011 Institution of Engineers Singapore (IES) Prestigious Engineering Achievement Award.

2. Dr. Karthik B, Department of Mechanical Engineering, NIT, Warangal, India (Host Faculty)

3. Dr. Kiran Kumar K, Department of Mechanical Engineering, NIT, Warangal, India (Host Faculty)

Course Co-ordinators

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