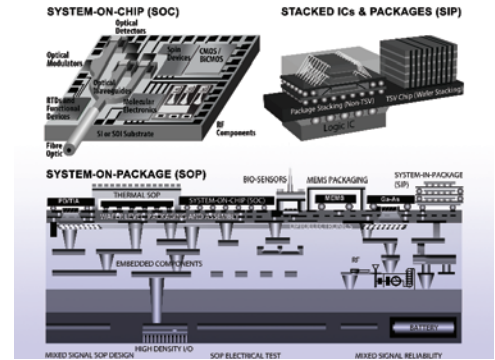




Fall 2008

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ECE/ME/MSE 6776: Introduction to SOP, SIP, 3D and SOC - An Interdisciplinary Perspective (3-0-3)

This is a system level overview and a cross-disciplinary microsystems packaging course that reviews and discusses the latest technology advances leading to highly miniaturized digital convergent systems for consumer, computer, telecom, wireless, healthcare and automotive systems. The course integrates various disciplines including electrical, materials, chemical and mechanical engineering and is an advanced introductory overview course that introduces the concept of SOP, SIP, 3D and SOC for graduate students in ECE, ME, MSE, ChemE, Physics and Chemistry. It provides both fundamental and applied aspects of digital convergent system technologies based on 14 years of intense research advances at the Microsystems Packaging Research Center at Georgia Tech by 35 faculty, 500 graduate students and more than 100 electronics companies. This course will be taught by multiple faculty experts in each of the topics.

Course Objectives:

- Provide a system level perspective with an overview of all system technologies and their applications.
- Explain what is meant by SOP, SOC, SOB, SIP, MCM and 3D and why miniaturize components & systems.
- Explain two basic laws: Moore's Law for ICs and System Integration Law for Systems.
- Explain, Compare & Contrast the five key microsystems technologies: SOB, SOC, SIP, 3D, MCM and SOP.
- Explain the implications of SOP technology for Digital Convergence.
- Explain the role of such disciplines as ECE, ME, ChE, MSE in SOP R&D & Mfg. and job careers in the industry.
- Review SOP technologies: Mixed signal design and test, Digital SOP, Thermal SOP, RF SOP, MEMS SOP, Opto SOP, SOP substrate with embedded components, Nano and Bio SOP, WL SOP, IC and system assembly, and SOP reliability.
- Explain future of SOP, such all-Si based SOP as a potential disruptive technology.
- Prepare students for industry culture by team work, interdisciplinarity, selection of an R&D topic to write and present a term paper with individual contributions..

- **Prerequisites:** Any introductory packaging course including EE4058 or the consent of an instructor.
- **Suggested Text and Reading:** Introduction to System-On-Package (SOP), McGraw-Hill, Rao R. Tummala and Madhavan Swaminathan, Spring 2008, ISBN-10: 0071459065, and Fundamentals of Microsystems Packaging edited by Rao. R. Tummala, McGraw Hill, ISBN 0-07-137169-9, 2001; selected research papers and class notes.
- **Schedule:** 12:05pm to 1:25pm Tues. & Thurs., Instructional Center 109; begins Aug. 18, 2008
- **Format:** Lectures, invited presentations, student team presentations