

Charge and Spin Based Electronics: From Devices to Circuits and Systems

Overview

The scaling down of Silicon devices, the driving force behind the growth of the semiconductor industry, is facing severe challenges beyond the 14nm technology regime. Hence, research has started in earnest to develop “new switches” that can either replace the CMOS switches or can add new functionalities that CMOS cannot achieve. In this series of lectures, I will present the challenges to designing scaled CMOS devices, solutions to reduce short channel effects in scaled CMOS transistors, and current research and developments in beyond-CMOS device technologies such as Tunnel FETs, ferro-electric FETs, spin-transfer torque based devices. Since some of the beyond CMOS devices may not be suitable as drop-in replacement for CMOS, there is a need to consider circuits and systems that are enabled by such technologies.

Modules	Module A: Scaled CMOS devices : June 13 - June 17, 2016 Module B: Spintronics : June 20 - June 24, 2016 Number of participants for the course will be limited to thirty.
You Should Attend If...	<ul style="list-style-type: none">▪ You are an industry practitioner involved in IC Design, fabrication and test of integrated circuits.▪ You are a Doctoral/post-graduate/undergraduate student, or faculty in electrical/electronic engineering and computer science/engineering from academic institution.
Fees	The participation fees for taking the course is as follows: Participants from abroad : US \$300 Industry/ Research Organizations: Rs. 20000 Academic Institutions: Rs. 5000 Students at all levels: Rs. 500 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.

The Faculty



Prof. Kaushik Roy is currently Edward G. Tiedemann Jr. Distinguished Professor in the department of electrical and computer engineering at Purdue University, West Lafayette, IN, USA. His research interests include spintronics, device-circuit co-design for nano-scale Silicon and non-Silicon technologies, low-power electronics for portable computing and wireless communications, and new computing models enabled by emerging technologies.



Prof. Hafizur Rahaman is a Professor of Indian Institute of Engineering Science and Technology (IEST), Shibpur, India. His research interest include design and testing of Integrated Circuits and nano-biochips, emerging nanotechnologies including reversible computing.

Course Co-ordinator

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