Advanced Wireless Networks: From 5G to Cognitive Radio

Overview

Emerging wireless network, both 5G and beyond, promises to offer a 1000 fold increase in data rate, through network densification and connectivity, through advanced cellular standards and device-to-device links. The emphasis of this course is hence both on technologies that shall result in massive spectrum enhancements and bring about energy efficiency in operation. It will first help navigate the complex landscape of evolving legacy technologies, such as the LTE standard that will see several new versions in the next few years to cope with these different scenarios. Moreover, it will delve into new and disruptive paradigms such as cognitive radio networks (CRNs) that promises to address the problem of spectrum scarcity by cognition of the environment and re-configurability within licensed bands. The course will discuss architectures for CRN and then cross-layer protocols spanning link, routing and transport layers. It will also describe concrete applications to specific scenarios like wireless medical telemetry service (WMTS), vehicular networks towards realization of smart city, smart home etc. Finally, the course will also discuss novel circuit and protocol development in powering future sensors and IoT through energy harvesting, mainly from the energy contained in the wireless spectrum.

Modules	• Introduction to Next Generation/5G Wireless Network • Introduction to Cognitive Radio • Bandwidth Estimation on LTE-A and CR • Energy Efficient Spectrum Sensing and Data Transmission in CR • Network Architecture Designs: CR in Vehicular Networks (CRV) • CR in Wireless Medical Telemetry Service (WMTS) • Spectrum and Path Routing in CR • Harnessing Energy from RF Spectrum: Wireless Energy Transfer and Scavenging • Energy Harvesting System Design • EE-SE trade-off and Energy Harvesting • IOT in CR **Number of participants for the course will be limited to FORTY.**
You Should Attend If…	❖ Graduate and Post-graduate students (B.Tech /M.Sc / M. Tech /Ph. D) of ECE/IT/CSE/EE **Faculty from Academic and Technical institutions of ECE/IT/CSE/EE** ❖ Practicing Engineers, Business Executives (Tech) as well as researchers from vendor, operator and government organizations including R&D laboratories.
Fees	The participation fees for taking the course is as follows: **Participants from abroad : US $200** **Industry/ Research Organizations: Rs. 10000** **Academic Institutions: Rs. 2000** **Students at all levels: Rs. 500** The above fees include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges. The participants will be provided with accommodation on payment basis.

How to Apply?	If you wish to register for the course please visit the website of GIAN http://www.gian.iitkgp.ac.in **1)** Click on Course Registration. **2)** Register and then **3)** Log-in **4)** Fill up your details **5)** Upload your photo and signature **6)** Make online payment of Rs. 500 **7)** Then click on Course Registration. List of available course will be shown **8)** Check the course **Advanced Wireless Networks: From 5G to Cognitive Radio** **9)** Click on Save **10)** Click on Confirm Courses Then you are done. Wait for our Communication. **11)** If selected then you have to pay the fees of the course and after paying the fees, your participation will be confirmed.

The Faculty

Prof. Kaushik Chowdhury is Associate Professor and Faculty Fellow at Department at Northeastern University, Boston, MA, USA. He is the recipient of the 2015 US National Science Foundation (NSF) CAREER award and the 2016 Office of Naval Research Director of Research Early Career award. In 2017, he was awarded the Presidential Early Career Award for Scientists and Engineers by President Obama. He received the Best Paper Award at the IEEE ICC Conference in 2009, 2012, 2013, which is the flagship conference of the IEEE Communications Society. He received other Best Paper awards for wireless research at the ICNC Conference in 2013 and IEE CAMAD in 2016. His research interests lie in wireless cognitive radio ad hoc networks, unmanned aerial systems, energy harvesting, and intra-body communication. He has offered special topic courses in the area of Cognitive Radio at his university, as well as at the University of Pavia, Italy (Fall 2015, 2016) and at the University Technology of Compiegne, France (Summer 2015). He has also participated as a speaker in international summer schools in the area of energy harvesting (2014) and vehicular networking (2016). He is currently an area editor for the IEEE Transactions on Wireless Communications and Elsevier Computer Networks journals. He served as the Chair for the IEEE Technical Committee on Simulation from 2014-17.

Prof. Santi P. Maity has been working as Professor since September, 2012 in the Dept. of Information Technology, Indian Institute of Engineering Science and Technology, Shibpur, India. His research interests include Cognitive Radio Networks, multicarrier (MC)-CDMA, Compressed Sensing image reconstruction on noisy channel, Medical Image Analysis, Blood Vessels and Lesion Detection on Retinal Images, Digital Image Watermarking, Secret Sharing etc. He has delivered about 45 invited lectures and tutorial talk in International and National Conferences, National Seminars, Workshops, Faculty Development Programs and acted as Coordinator, TPC Member, Program Chair(s) and General Chair(s) in International Conferences.

Date: 18th December, 2017to 22nd December, 2017

Course Coordinator

Prof. Santi P. Maity
Professor, Dept. of Information Technology
Indian Institute of Engineering Science & Technology (IIEST), Shibpur
Phone: 033-26684561/62/63 Ext.249/309
Mobile: 9830023316
E-mail: santipmaity@it.iiests.ac.in
santi.maity@gmail.com

http://www.gian.iitkgp.ac.in
http://www.iiests.ac.in