Advanced Wireless Communication Technologies: Cognitive Radio, Spectrum Sharing, and Optical Wireless Communications

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Overview

After years of advances and developments in telecommunications industry, mobile cellular systems are becoming mature. Physical layer (PHY-Layer) was at the forefront of rapid changes in the previous decades and still remains an important research area in new radio frequency (RF) technologies such as: Cognitive Radio (CR) and Spectrum Sharing, Energy Harvesting and Wireless Powered Communications, and Optical Wireless Communications (OWC).

CR has emerged as one of the most promising technologies to resolve the issue of spectrum scarcity, caused by the escalating growth in wireless data traffic. One of the principal requirements of CR is the effectiveness of spectrum sharing performed by secondary (unlicensed) nodes, which is expected to intelligently mitigate any harmful interference caused to the primary (licensed) network nodes. The concept of spectrum sharing was originally proposed in CR networks to allow secondary or unlicensed users to opportunistically access the temporally or spatially unused spectrum bands of the primary or licensed users. OWC (indoor and outdoor) is an alternative effective way of transmitting information with considerably higher bandwidth compared to RF communications. Energy harvesting through RF transmissions technique seems to be a very promising solution to power hungry applications such as wireless sensor networks where limited lifetime degrades the performance of the network.

The topics in the module include i) Cooperative Cognitive Radio, ii) Spectrum Sharing and Carrier Aggregation, iii) Energy Harvesting and Wireless Power Transfer, and iv) Optical Wireless Communications (FSO & VLC). Course participants will learn the above topics through lectures. Also tutorials will be organized during different topics of the course to stimulate research motivation of participants.

Modules	**A: Cooperative Cognitive Radio: Dec 13** **Spectrum Sharing and Carrier Aggregation: Dec 14** **Energy Harvesting and Wireless Power Transfer: Dec 15** **B: Optical Wireless Communications Dec 16 - Dec 17** **The course inauguration and desk registration will take place on Dec 12, 2016 (Evening).**
You Should Attend If…	▪ You are a student (B.Tech./M.Sc./M.Tech./Ph.D.) and aspiring researcher within broad domain of communication engineering. ▪ You are an Executive/engineer or researcher from manufacturing, service and government organizations including R&D laboratories. ▪ You are Faculty and staff from reputed academic institutions and technical institutions.
Fees	The participation fees per person for attending the course is as follows: **Participants from abroad : US $300** **Industry/ Research Organizations: Rs. 5000/-** **Academic Institutions:** **Students: Rs. 1000/- (For SC/ST students course fee is Rs. 500/- only)** **Non-Students: Rs. 3000/-** **For five days Lunch, each participant will be charged Rs. 800/- only in addition to the course fees.** The above fees include all instructional materials, computer use for tutorials, free internet facility. The participants will be provided with single bedded shared accommodation and dinner on additional payment basis.

The Faculty

Dr. Theodoros A. Tsiftsis received the B.Sc. degree in physics from Aristotle University of Thessaloniki, Thessaloniki, Greece, in 1993, the M.Sc. degree in digital systems engineering from Heriot-Watt University, Edinburgh, U.K., in 1995, the M.Sc. degree in decision sciences from Athens University of Economics and Business, Athens, Greece, in 2000, and the Ph.D. degree in electrical engineering from the University of Patras, Patras, Greece, in 2006. He joined the Technological Educational Institute of Central Greece in 2010. He is currently an Associate Professor with the Department of Electrical and Electronics Engineering, School of Engineering, Nazarbayev University, Kazakhstan. He has authored over 100 technical papers in scientific journals and international conferences and approx. 2755 citations (GoogleScholar) (h-Index 27). Dr. Tsiftsis has participated in plethora of research projects and he actually serves as a National Expert for Greece in the HORIZON 2020 Information and Communication Technologies theme (2014-2020). His research interests include the broad areas of cooperative communications, communication theory, wireless communications, and optical wireless communication systems. Dr. Tsiftsis acts as reviewer for several international journals and serves as *Area Editor of Wireless Communications Area of the IEEE Transactions on Communications* and *Associate Editor in IEICE Transactions on Communications*. He has also served as *Senior Editor in IEEE Communications Letters*, *Assoc. Editor of IEEE Transactions on Vehicular Technology* and *IET* Communications.

Dr. Prabhat Kumar Sharma is an Assistant Professor in the Department of Electronics and Communication Engineering, Visvesvaraya National Institute of Technology, Nagpur (India). He received his Ph.D. degree in wireless communications from University of Delhi, New Delhi, India in 2015. He has authored several papers in the journals and conferences of international repute. His research interests include optical wireless communication, cognitive radio, full duplex communication and power line communications. Dr. Sharma acts as a regular reviewer for reputed journals such as *IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Communications Letters, IEEE Transactions on Vehicular Technology IEEE, IET Communications and IEEE Internet of Things Journal.*

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Course Co-ordinator

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For Registration:
http://www.gian.iitkgp.ac.in/GREGN

For more details:
http://www.vnit.ac.in