



## ONE-WEEK SHORT TERM COURSE ON SENSOR NETWORKS FOR CIVILIAN APPLICATIONS

(Sponsored by Ministry of Human Resource Development (MHRD), Under the Scheme 'GIAN')

(01 JANUARY 2018 –07 JANUARY 2018)

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### MOTIVATION

Mobile systems have a unique capability of maintaining the same contact number even if one moves from one location to another, which has made them increasingly popular. The mobile telephones are not only convenient but are also providing flexibility and versatility and there have been a growing number of wireless phone subscribers as well as service providers. A Wireless Sensor Network (WSN) employs a Base Station (BS) or a sink collecting information from several sensor nodes (SNs) and has become very popular for monitoring activities without any human intervention. Various characteristics of WSNs are covered as SNs have small local memory, and processing of raw data and inclusion of wireless transceiver have made them versatile and useful in monitoring of an unattended area. Various underlying issues and associated parameters for civilian applications are studied in detail. As all WS units get power from the battery, it is critical to conserve energy as much as possible. But, there are many civilian applications where access to the event area is possible and SNs can be placed at predefined locations. Firstly, topologies that are appropriate for these applications are defined and associated performance issues are characterized. Three such examples of SNs in rectangular, triangular and hexagonal tiles of clusters are shown. There are many underlying issues that need careful considerations and this course provides an insight of various parameters that affect the performance and have long-lasting impact. Applications for biomedical area is also explored. Security considerations are also covered to illustrate the balance between algorithmic complexity, power consumption and security requirements.

### OBJECTIVES

The main objectives of this course are to:

- i) Understanding Wireless technology and recent advances in Sensor Networks for civilian applications,
- ii) Providing exposure to engineers and researchers from both industry and universities,
- iii) Building in confidence and capability amongst the participants in the applications of wireless technologies and techniques for civilian applications,
- iv) Providing exposure to practical problems and their solutions, through case studies, and
- v) Enhancing the capability of the participants to identify and manage system-related problems.

<b>Course Schedule</b>	<b>January 01-07, 2018</b> Number of participants for the course will be limited to <b>30</b> .
<b>Who Can Attend?</b>	<ul style="list-style-type: none"> <li>• Faculties, Instructors, Researchers, Postdoctoral Fellows, students at all levels (B.Tech./M.Sc./ MCA/MTech/PhD) who want to learn state-of-the-art in sensor networks.</li> <li>• Executives, engineers and researchers, working in industries, as well as, in government research organizations.</li> </ul>
<b>Fees</b>	<p>Participants from Abroad: <b>US \$100</b>  Industry/Research Organizations: <b>Rs. 3000/-</b>  Faculty Members / Researches: <b>Rs. 1500/-</b>  Students (pursuing Bachelors / Masters courses/Ph. D.): <b>Rs. 750/-</b></p> <ul style="list-style-type: none"> <li>• Registration fee only includes attendance to sessions, course material and lecture notes.</li> <li>• The course fee does not include accommodation. However, the participants will be provided accommodation on payment basis in the institute guest-house based on availability.</li> <li>• The registration fee should be paid by DD drawn in favor of “<b>Director, NIT Kurukshetra</b>”, payable at <b>SBI NIT Kurukshetra</b>.</li> </ul> <p>To register or for any questions please send an email to <a href="mailto:bbgupta@nitkkr.ac.in">bbgupta@nitkkr.ac.in</a></p>

## REGISTRATION PROCESS

Registration for GIAN courses are not automatic because of the constraints on maximum number of participants allowed to register for a course. To register for one or multiple non-overlapping courses, you have to apply online using the following steps:

### Stage 1:

Web (Portal) Registration: Visit GIAN Website at the link:

<http://www.gian.iitkgp.ac.in/GREGN/index> and create login user ID and Password. Fill up blank registration form and do web registration by paying Rs. 500/- on line through Net Banking/ Debit/ Credit Card. This provides the user with life time registration to enroll in any number of GIAN courses offered.

### Stage 2:

Course Registration (Through GIAN Portal): Log in to the GIAN portal with the user ID and Password created. Click on “Course Registration” option given at the top of the registration form. Select the Course titled “**Sensor Networks for Civilian Applications**” from the list and click on “Save” option. Confirm your registration by Clicking on “Confirm Course”.

Only Selected Candidates will be intimated through E-mail by Course Coordinator. They have to remit the necessary course fee in the form of DD drawn in favor of “**The Director, NIT Kurukshetra**” payable at NIT Kurukshetra.

**The last date of registration is 15 December 2017.**

**Number of participants for the course is limited to 30.**

## **COURSE FACULTY**

Prof. Dharma P. Agrawal  
OBR Distinguished Professor,  
Department of Electrical Engineering and Computer Science  
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**Dr. Dharma P. Agrawal** is OBR Distinguished Professor and the founding director for the Centre for Distributed and Mobile Computing in the Department of Electrical Engineering and Computer Science. He has been a faculty member at the ECE Dept., Carnegie Mellon University (on sabbatical leave), N.C.S.U. Raleigh and the Wayne State University. His current research interests include applications of sensor networks in monitoring Parkinson’s disease patients and neurosis, applications of sensor networks in monitoring fitness of athletes’ personnel wellness, efficient secured communication in Sensor networks, secured group communication in Vehicular Networks, and security in mesh networks for 4G technology. This course is based on his recent book entitled Embedded Sensor Systems being published by Springer in Jan. 2017. His recent contribution in the form of a co-authored introductory text book on Introduction to Wireless and Mobile Computing has been widely accepted throughout the world. His co-authored book on Ad hoc and Sensor Networks, 2<sup>nd</sup> edition, has been published in spring of 2011. He is a founding Editorial Board Member, International Journal on Distributed Sensor Networks, International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC), International Journal of Ad Hoc & Sensor Wireless Networks and the Journal of Information Assurance and Security (JIAS). He has served as an editor of the IEEE Computer magazine, and the IEEE Transactions on Computers, the Journal of Parallel and Distributed Systems and the International Journal of High Speed Computing. He was awarded a Third Millennium Medal, by the IEEE for his outstanding contributions. He has delivered keynote speech at 41 different international conferences. He has published over 687 papers, given 57 different

tutorials and extensive training courses in various conferences in USA, and numerous institutions in Taiwan, Korea, Jordan, UAE, Malaysia, and India in the areas of Ad hoc and Sensor Networks and Mesh Networks, including security issues. He has graduated 75 PhDs and 67 MS students. He has been named as an ISI Highly Cited Researcher, is a Fellow of the IEEE, the ACM, the AAAS and the World Innovation Foundation, and recipient of 2008 IEEE CS Harry Goode Award. In June 2011, he was selected as the best Mentor for Doctoral Students at the University of Cincinnati. Recently, he has been inducted as a charter fellow of the National Academy of Inventors.

## **COURSE COORDINATOR & CONTACT INFORMATION**

### **Dr. B. B. Gupta**

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**Dr. B. B. Gupta** is Assistant Professor in the Department of Computer Engineering, National Institute of Technology Kurukshetra, India. He has published more than 100 research papers in International conferences and Journals of high repute. His research interest includes Information security, Cyber Security, Mobile/Smartphone, Cloud Computing, Web security, Intrusion detection, Computer networks and Phishing.