[151003D02] Advanced Topics in Instrumentation

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Overview

In this course, the important sensors and associated instrumentation required for measurement and monitoring of vital environmental parameters will be discussed. This is a research level cum higher undergraduate level course and it is interdisciplinary, in nature.

The natural environment plays a key role in making the life of human and other animals enjoyable and fruitful in the Earth. It is a well-known that the effect of the numerous manmade pollution is huge. It is a high-time to monitor and asses the natural environmental parameters on a regular basis. There are a very few sources available that provides information on how to develop and use sensor systems for effective environmental monitoring. This course is aimed at developing the technical skills for the researchers and engineers working/planning to work in the in the area of environmental monitoring.

Objectives of the course include, (a) to provide an overview of the importance of environmental monitoring, (b) to develop necessary skill-set to select appropriate sensors and develop the associated signal conditioning to monitor important environmental parameters, (c) to train the students/engineers on the best methods to transmit, store and analyse and interpret the data from the sensors, and (d) to provide a hands-on experience in electronic system design concept, in the point of view of environmental monitoring.

Modules/Brief Syllabus	Importance of environmental monitoring, climate change issues and parameters to be sensed and monitored, sensors, measurement methods, interfacing electronic circuit design, communication protocols, standards, installation and maintenance issues, energy sources for sensing and communication, ethical issues, data analysis and interpretation, system design concept.
You may consider attending If…	▪ you are a student or faculty from an academic institution interested in learning/ wish to work in the environmental monitoring domain. ▪ you are an electronics engineer or research scientist interested in designing and development of sensors and instrumentation systems for environmental monitoring .
Fees	The participation fees for taking the course is as follows: Student participants : Rs. 2000 Industry/ Research Organizations: Rs. 20000 Faculty members from Academic Institutions: Rs. 10000 The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, etc. The participants will be provided with accommodation on payment basis.

The Faculty

Prof. Subhas Mukhopadhyay received the Masters degree in electrical engineering from the Indian Institute of Science, Bangalore, India and the Ph.D. degree in engineering from Jadavpur University, and the Doctor of Engineering degree from Kanazawa University, KanazawaShi, Japan.

He is currently a Professor of sensing technology with the School of Engineering and Advanced Technology, Massey University, Palmerston North, New Zealand. He has over 25 years of teaching and research experience. He has authored/co-authored over 300 papers in different international journals, conferences, and books. He has edited thirteen conference proceedings, twelve special issues of international journals as a Lead Guest Editor and twenty-five books, with Springer-Verlag. His research interests include sensors and sensing technology.

Dr. Mukhopadhyay has been awarded numerous awards in his career. He is a Fellow of the IEEE (USA), IET(U.K.) and IETE (India). He is a Topical Editor of the IEEE Sensors journal and an Associate Editor of the IEEE transactions on Instrumentation and Measurements.

He was the Technical Program Chair of ICARA 2004, ICARA 2006, and ICARA 2009. He was the General Chair/Co-Chair of ICST 2005, ICST 2007, IEEE ROSE 2007, IEEE EPSA 2008, ICST 2008, IEEE Sensors 2008, ICST 2010, IEEE Sensors 2010, and ICST 2011, and ICST 2012, and ICST 2013 and ICST 2014. He has organized the IEEE Sensors Conference at Christchurch, New Zealand, as the General Chair in October 2009. He was a Distinguished Lecturer of the IEEE Sensors Council, 2010-2013.

Prof. Jagadeesh Kumar received the B.E. degree in electronics and communication engineering from the College of Engineering, Chennai, India, in 1978, and the M.Tech. and Ph.D. degrees from IIT Madras, Chennai, in 1980 and 1986, respectively.

He was with King's College London, London, U.K., in 1988, the Asian Institute of Technology, Bangkok, Thailand, in 1996, the University of Braunschweig, Braunschweig, Germany, in 1998, and the University of Aachen, Aachen, Germany, in 1999. He had guided 7 Ph.D. scholars and 11 M.S. scholars. He is currently a Professor of Electrical Engineering with IIT Madras, where he is the Head of the Central Electronics Center. He has authored 50 journal articles, mostly in the IEEE journals, and presented 90 papers in international conferences. He holds six patents. His current research interests include measurements, instrumentation, and signal processing. Dr. Kumar received the Young Scientist Award from the Department of Science and Technology in 1988 and the DAAD Fellowship Award in 1997.

Dr. Boby George received the M.Tech. and Ph.D. degrees in electrical engineering from IIT Madras, Chennai, India, in 2003 and 2007, respectively. He was a Post-Doctoral Fellow with the Institute of Electrical Measurement and Measurement Signal Processing, Technical University of Graz, Graz, Austria, from 2007 to 2010. Since 2010, he has been with the faculty of the Department of Electrical Engineering, IIT Madras, where he is currently an Associate Professor. His current research interests include sensors and electronic instrumentation.

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