

WIRELESS COMMUNICATION SYSTEMS, COMPONENTS AND MEASUREMENTS

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Welcome to the 2011 IEEE International Courses for Wireless Technology Professionals – “Wireless Communication Systems, Components and Measurements” jointly organized by Wireless Communication Laboratory of Faculty of Science and Technology of University of Macau and IEEE (Macau) AP/MTT Joint Chapter. This course provides an intensive training to the participants about the latest wireless communication system, from the system architecture to component level. The course is organized in the following three parts:

Part I - Wireless Communication Systems

High-speed and multi-function wireless communication presents an essential application feature of advanced wireless technologies. This wireless technology should support enhanced services personalized to each individual user. The understanding of the latest telecommunication developments is concerned with the study of design principles, circuit technologies, system architectures and standards, and market trends that have been driving wireless communications for voice telephony, data communications, mobile internet and so forth. At the core of this part are mainly the cellular/microcellular/frequency re-use concepts commonly used in the emerging wireless communications. Broadband techniques with high spectral and power efficiency will be discussed. With practical examples, the following aspects are focused so as to allow the audience to grasp the important concepts of advanced wireless communications.

Part II - Wireless Communication Components

This part deals with the system architectures and RF design techniques for receivers and transmitters used in wireless communication systems. Nonlinear circuit analysis, CAE, and device modeling essential for the design and analysis of large signal elements such as power amplifiers, oscillators, mixers, modulators, and limiters as well as distortion and noise effects in small signal elements such as LNAs will be presented. Narrowband and broadband designs are compared. Basic impedance matching techniques are presented. Low-noise and power amplifier design platforms are also illustrated, discussing trade-offs amongst gain flatness, linearity, efficiency, noise and impedance matching. Besides, basic antenna theory is introduced together with examples that include compact and multi-band antennas used in wireless devices.

Part III - Wireless Communication Measurements

Characterization of RF and wireless components and systems requires accurate measurements and procedures in addition to the basic understanding of signal generation and processing. Constraints in low and high signal levels of modern transmitter and receiver are studied. Applying proper calibration and measurement procedures minimizes potential errors and inaccuracies in characterization. This part makes use of modern scalar and vector measurement facilities to demonstrate the signal characterization of selected RF/microwave components with low and high signal levels.

Date: August 10, 11 and 12, 2011
Time: 2:30 p.m. to 5:30 p.m.
Venue: Alameda Dr. Carlos d' Assumpção, n° 411-417, Edif. "Dynasty Plaza" 9° andar
Auditorium of Science and Technology Development Fund, Macao SAR, China

Organizers:



Supporting Organizations:



2011 IEEE INTERNATIONAL COURSES FOR WIRELESS TECHNOLOGY PROFESSIONALS

About the lecturer:



Dr. Ke Wu is professor of electrical engineering, and Tier-I Canada Research Chair in RF and millimeter-wave engineering at Ecole Polytechnique (University of Montreal). Dr. Wu also holds a number of visiting (guest) and honorary professorships at various universities around the world including the first Cheung Kong endowed chair professorship at Southeast University, the first Sir Yue-Kong Pao chair professorship at Ningbo University, and honorary professorship at Nanjing University of Science and Technology, Nanjing University of Post and Telecommunication, and City University of Hong Kong. He has been director of the Poly-Grames Research Center and the founding director of "Centre de recherche en électronique radiofréquence" (CREER) of Quebec. He has (co)-authored over 750 referred papers, a number of books/book chapters and patents. His current research interests involve substrate integrated circuits (SICs), antenna arrays, advanced CAD and modeling techniques, and development of low-cost RF and millimeter-wave transceivers. He is also interested in the modeling and design of microwave photonic circuits and systems. He serves on the Editorial Board of Microwave Journal, Microwave and Optical Technology Letters, and Wiley's Encyclopedia of RF and Microwave Engineering. He is an Associate Editor of International Journal of RF and Microwave Computer-Aided Engineering (RFMiCAE).

Dr. Wu is a member of Electromagnetics Academy, the Sigma Xi Honorary Society, and the URSI. He has held many positions in and has served on various international committees, including co-chair of the Technical Program Committee (TPC) for 1997 and 2008 Asia-Pacific Microwave Conferences (APMC), General Co-Chair of 1999 and 2000 SPIE's Inter. Symposia on Terahertz and Gigahertz Electronics and Photonics, General Chair of 8th Inter. Microwave and Optical Technology (ISMOT'2001), TPC Chair of 2003 IEEE Radio and Wireless Conference (RAWCON'2003), General Co-Chair of RAWCON'2004, Co-Chair of 2005 APMC Inter. Steering Committee, General Chair of 2007 URSI Inter. Symp. on Signals, Systems and Electronics (ISSSE), and General Co-Chair of 2008 and 2009 Global Symposia on Millimeter-Waves, and Inter. Steering Committee Chair of 2008 Inter. Conference on Microwave and Millimeter-Wave Technology. In particular, he will be General Chair of 2012 IEEE MTT-S International Microwave Symposium (IMS). He has served on Editorial or Review Boards of various technical journals, including the IEEE TRANSACTIONS ON MTT, the IEEE TRANSACTIONS ON AP, the IEEE MWCL and the IEEE Proceedings. He served on the Steering Committee for the 1997 joint IEEE AP-S/URSI Inter. Symp. and the TPC for the IEEE MTT-S Inter. Microwave Symp. He is currently chair of the joint IEEE chapters of MTTs/APS/LEOS in Montreal. He is an elected MTT-S AdCom member for 2006-2012 and serves as Chair of the IEEE MTT-S Member and Geographic Activities (MGA) Committee. He was the recipient of a URSI Young Scientist Award, IEE Oliver Lodge Premium Award, Asia-Pacific Microwave Prize, IEEE CCECE Best Paper Award, University Research Award "Prix Poly 1873 pour l'Excellence en Recherche" presented by the Ecole Polytechnique on the occasion of its 125th anniversary, Urgel-Archambault Prize (the highest honor) in the field of physical sciences, mathematics and engineering from ACFAS, 2004 Fessenden Medal of IEEE Canada, and 2009 Thomas W. Eadie Medal of the Royal Society of Canada (The Canadian Academy of the Sciences and Humanities). In 2002, he became the first recipient of the IEEE MTT-S Outstanding Young Engineer Award. He is Fellow of the IEEE, Fellow of the Canadian Academy of Engineering and Fellow of the Royal Society of Canada. He is a MTT-S Distinguished Microwave lecturer from January 2009 to December 2011.

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