

Seminar on **RF System and RFIC Design**



Date: Sep 20 –21, 2006
Time: 9:30pm – 5:00pm
Fee: HK\$ 3,000 / person

Venue: Convention Hall 1, G/f., Core Building, Science Park, Shatin, Hong Kong

Introduction: This course is aimed to provide an opportunity for participants to acquire technical insights on some of the vital aspects of RF System and RFIC Design from industry perspective. It is structured into two modules. The first module will cover the vital aspect and design considerations on various functional blocks of RF System. Designs on commercial products will be presented to the participants to gain in-depth and integral perspective on RF System Design. The second module will provide an overview on the design flow of RFIC. Specific issues pertaining to RFIC design will be highlighted for discussion. Practical design issues and tips on some critical RF building block such as LNA, Mixer and Biasing circuits will be presented. Both modules will be conducted by experienced RF experts from the industry with local and overseas working experience. Interactive and open discussions between speakers and participants are encouraged and facilitated to make the whole course more interesting and thought stimulating.

Who should attend:

IC designers, wireless product designers, field application engineers, business development engineers and managers, design managers

Who you will learn:

- Basics of RF System and RFIC design
- Process technology and CAD tools for RFIC design
- Critical issues and design tips on critical RF building blocks

Instructors:

Dr. C M Yuen received his B.Eng. and Ph.D degree in Electronic Engineering from the City University of Hong Kong. His research interest is mainly in the design of RF and Microwave circuits for low voltage and low power consumption wireless systems. He has twenty years of experience in RF product design and manufacturing in Hong Kong and Mainland China. Dr. Yuen is currently an advisory engineer in the field of HDTV and IPTV.

Mr. Henry Lau received his M.Sc. and MBA degrees from UK and US respectively. He has more than 20 years of experience in designing RF system, products and RFICs in both Hong Kong and US. He had worked for Motorola and Conexant in US as Principal Engineer on developing RFICs for cellular phone and silicon tuner applications. Mr. Lau holds four US patents and has two patents pending. He is currently running Lexiwave Technology Ltd., a fabless semiconductor company in Hong Kong and US designing and selling RFICs.

Course Content:

DAY 1: RF System Design - VHF and UHF Low Power RF Transceiver

Transmitter

- Circuit blocks: oscillator, modulator, buffer amplifier, frequency multiplier, power amplifier, output filter
- Major issues: C/N, modulation depth, voltage gain, power gain, power efficiency, harmonic prevention and suppression

Receiver

- Circuit blocks: LNA, local oscillator, mixer, IF amplifier, demodulator, baseband amplifier, compander
- Major Issues: Gain / intermodulation balance, bandwidth and noise, mixer gain, mixer efficiency, IF gain and bandwidth, baseband bandwidth, S/N optimization, current consumption

Frequency Synthesizer

- Circuit Blocks: RF Oscillator, buffer amplifier, PLL chip, loop filter, quartz crystal oscillator
- Major Issues: Phase noise, channel acquisition, programming technique, frequency stability: temperature, supply voltage, load pulling

Antenna

- External antenna: dimension, connector quality
- Internal antenna: dimension, location, spacing, material, matching

DAY 2: RFIC Design – Basics and Building Block Design

Basics of RFIC Design

- Methodology and considerations
- Process technology: Bipolar, CMOS, BiCMOS, SiGe BiCMOS

RFIC Building Block Design

- Low Noise Amplifier (LNA): topology and design considerations
- Mixer: topology and design considerations
- Voltage and Current Biasing: bandgap, PTAT, startup circuitry

RFIC Design Flow and CAD Tools

- RF and Analog and Design Flows
- Simulation and Layout Tools: Cadence, ADS, TopSpice, Tanner

Registration Form

Seminar on RF System and RFIC Design

September 20, 2006 9:30am – 5:00pm (Seminar) & 5:00pm – 5:30pm (Laboratory Tour)
September 21, 2006 9:30am – 5:00pm (Seminar)

Convention Hall 1, G/f., Core Building 1, Science Park, Shatin

Standard Course Fees: HK\$ 3,000 per person* (handout & lunch included)

*Reimbursement for 75% course fees from entitled T(M)AP applicable for Science Park tenants/Incubatees

Return form with full payment **before September 13, 2006** to

FAX: 2607 4040 or **EMAIL:** enquiry.iuc@hkstp.org

Enquiry: Industry & University Collaboration, BDTS, HKSTP (TEL: 2629 6695)

Company: _____ [] SP Tenant [] Incubatee

Address: _____

Contact: _____ Title: _____

Tel: _____ Fax: _____ E-mail: _____

Note: Payment receipt will be mailed to above address and contact person

Name	Title	Email	Lab Tour*	Sub-Total
			[<input type="checkbox"/>]	HK\$
			[<input type="checkbox"/>]	HK\$
			[<input type="checkbox"/>]	HK\$
			[<input type="checkbox"/>]	HK\$
Total:				HK\$

* Please tick for attendance

Payment

I shall pay for the Total Amount of **HK\$** _____ by below marked payment method:

[] **By Cheque**

Payable to "**Hong Kong Science and Technology Parks Corporation**" with copy of this registration form to:

Hong Kong Science and Technology Parks Corporation

Unit 307, IC Development Centre, Hong Kong Science Park, Shatin

Attention: Industry & University Collaboration (RF System & RFIC Design course)

[] **By Credit Card** VISA MasterCard

Card Number: _____ - _____ - _____ - _____ Expiry Date : _____(MM)/ _____ (YY)

Name of Cardholder: _____ Signature: _____

Remarks: 1. First-come-first-served for registration completed with full payment. Substitutions allowed. Cancellations non-refundable.
2. Class would be re-scheduled/cancelled (refundable) if registration below expected size.
3. Organizer reserves the right to amend program without prior notice.

This information is brought to you by Industry & University Collaboration, HK Science & Technology Parks Corp ("HKSTP").

HKSTP is a statutory body set up by the Government of the Hong Kong Special Administrative Region with the mission in leading the transformation of Hong Kong into Asia's hub for technology and innovation in the four focused clusters: Electronics, Biotechnology, Precision Engineering, Information Technology & Telecommunications.