Form 2B

City University of Hong Kong

Information on a Course
offered by Department of _Electronic Engineering
with effect from Semester B 2014/15

Part I

Course Title:	Mobile Communication and Networks
Course Code:	EE6453
Course Duration:	One Semester (13 weeks)
No. of credits:	3
Level:	P6
Medium of Instruction:	English
Prerequisites *(Course Code and Title)*:	Nil
Precursors *(Course Code and Title)*:	EE3008 Principles of Communications; or equivalent
Equivalent Course *(Course Code and Title)* :	Nil
Exclusive Courses: *(Course Code and Title)*:	Nil

Part II

1. Course Aims:

The course aims to provide students with theoretical and technical knowledge in cellular mobile communications.

2. Course Intended Learning Outcomes (CILOs)

Upon successful completion of this course, students should be able to:

No.	CILOs
1.	Evaluate and characterize the large-scale and small-scale propagation behaviour of wireless channels using empirical and statistical models, and apply effective techniques to combat multi-path fading
2.	Analyze frequency reuse principles for the 1st generation cellular systems
3.	Analyze coding and modulation techniques for the 2nd generation cellular systems
4.	Analyze CDMA technology for the 3rd generation cellular systems
5.	Analyze OFDM technology for the 4th generation cellular systems
6.	Comment on new technology for future cellular systems

3. Teaching and Learning Activities (TLAs)

CILOs 1-6	Lecture

Timetabling Information

Pattern	**Hours**
Lecture:	39*
Tutorials:	
Laboratory:	
Other activities:	

* Some of the lecture hours will be used for tutorials.

4. Assessment Tasks/Activities

	Type of assessment tasks	*Weighting (if applicable)*
Continuous Assessment	Two tests	30%
Examination	Written exam	70% 2 hours

Remarks: To pass the course, students are required to achieve at least 35% in course work and 35% in the examination.

5. Grading of Student Achievement:

Refer to Grading of Courses in the Academic Regulations for Taught Postgraduate Degrees.

Letter Grade	**Grade Point**	**Grade Definitions**
A+ A A-	4.3 4.0 3.7	Excellent
B+ B B-	3.3 3.0 2.7	Good
C+ C C-	2.3 2.0 1.7	Adequate
D	1.0	Marginal
F	0.0	Failure

6. Constructive Alignment with Programme Outcomes

PILO	**How the course contribute to the specific PILO(s)**
1, 2, 3, 4,5,6	This course provides students with knowledge and various techniques for mobile communications. Students are encouraged to develop the ability to integrate their learning of the course into a real-world design in Mobile Communication Systems and Networks Students are encouraged to develop the ability to integrate their learning of the course into a real-world design in Mobile Communication Systems and Networks

Part III

Keyword Syllabus:

Signal propagation and mobile channels: Fast fading and slow fading; flat fading and frequency-selective fading; vehicle motion and Doppler frequency shift; coherence bandwidth and coherence time.

Cellular systems: Frequency reuse; reuse pattern; system capacity; channel assignment; signal to co-channel interference ratio; power control and handoff.

Modulation and coding techniques: Brief description of GSM; convolutional codes and turbo codes; generation polynomials; shift registers encoder; trellis diagram and Viterbi decoder; free distance and correction capability; Soft-in soft-output decoder; MSK and its power spectrum.

CDMA systems: Brief description of IS-95; spreading codes; PN sequences; processing gains; interleaving;

OFDM systems: Brief description of LTE; DFT and FFT; adaptive loading; cyclic pre-fix; peak-to-average-power ratio; time-frequency resource.

Multiple antenna techniques: Beam patterns to nullify co-channel interferers; maximal ratio combining; equal gain combining; selection combining; diversity gain; space-division multiple access (SDMA).

Recommended Reading:

1) titles: 《Wireless Communications》
authors: Andrea Goldsmith（Stanford University）
years: 2005
publishers: Cambridge University Press

2) titles: 《Fundamentals of Wireless Communication》
authors: David Tse （UC Berkeley）
years: 2005
publishers: Cambridge University Press

Online Resources (if any)
Nil