

**City University of Hong Kong
Course Syllabus**

**offered by College/School/Department of Electrical Engineering
with effect from Semester B in 2019/2020**

Part I Course Overview

Course Title: Mobile Data Networks

Course Code: EE4316

Course Duration: One Semester (13 weeks)

Credit Units: 3

Level: B4

Proposed Area:
(for GE courses only)

Arts and Humanities
 Study of Societies, Social and Business Organisations
 Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites:
(Course Code and Title) EE3009 Data Communications and Networking

Precursors:
(Course Code and Title) Nil

Equivalent Courses:
(Course Code and Title) Nil

Exclusive Courses:
(Course Code and Title) CS4284 Mobile Computing

Part II Course Details

1. Abstract

The aim of this course is to provide students with the knowledge of various network technologies and related protocol architectures to support mobile data communications.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs [#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Explain the principles of cellular mobile network		✓	✓	
2.	Evaluate the performance of cellular mobile networks		✓	✓	
3.	Explain the design principles mobile of 802.11 WLAN		✓	✓	
4.	Explain the design principles of new generations of mobile networks		✓	✓	
		100%			

* If weighting is assigned to CILOs, they should add up to 100%.

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4			
Lecture and Tutorial	Key concepts are described and illustrated, with related tutorial questions	✓	✓	✓	✓			3 hrs/ week (2 hrs Lect, 1 hr Tut)

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3	4	5			
Continuous Assessment: <u>50%</u>								
Tests (min.: 2)	✓	✓	✓	✓			40%	
#Assignments (min.: 3)	✓	✓	✓				10%	
Examination: <u>50%</u> (duration: 2 hrs , if applicable)								
Examination							50%	
							100%	

* The weightings should add up to 100%.

Remark:

To pass the course, students are required to achieve at least 30% in course work and 30% in the examination.
may include homework, tutorial exercise, project/mini-project, presentation

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Examination	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Coursework	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal levels

6. Constructive Alignment with Major Outcomes

MILO	How the course contribute to the specific MILO(s)
1, 2	Students are able to understand the techniques in design and analyse cellular mobile networks.
3,4,5	Students are able to understand the general principles in 802.11 WLAN and Mobile IP protocols.

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

Fundamentals of Cellular Networks

Circuit Switching, Cellular Topology, Signal-to-interference ratio, FDMA, AMPS system, Capacity Expansion Techniques, Teletraffic Analysis

GSM Networks

System Architecture, Protocols, TDMA, Localization and Calling, Logical and Physical Channels

GPRS Services

Reference Architecture, Location and Handoff Management, Protocol Layers

UMTS

System Architecture, CDMA, 3.5G (HSDPA, HSUPA and HSPA)

4th Generation Systems and Beyond

System architecture, evolved packet core (EPC), OFDMA, LTE, LTE Advanced, Introduction to 5G

802.11 Wireless LAN

System Architecture, Protocol Architecture, Medium Access Control, MAC management, Security

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	N/A
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2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Pahlavan and Krishnamurthy: <u>Principles of Wireless Access and Localization</u> , (Wiley, 2013)
2.	Rappaport T S: <u>Wireless Communications: Principles and Practice</u> , (Prentice Hall PTR, 2002)
3.	Murthy and Manoj: <u>Ad Hoc Wireless Networks: Architecture and Protocols</u> , (Prentice Hall, 2004)
4.	Dahlman: <u>4G LTE Advanced Pro and the road to 5G</u> , (Academic Press, 2016)