City University of Hong Kong
Course Syllabus

offered by Department of Electronic Engineering
with effect from Semester B in 2017/2018

Part I Course Overview

Course Title:	Advanced Topics in Networking Technologies
Course Code:	EE6413
Course Duration:	One Semester (13 weeks)
Credit Units:	3
Level:	P6
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	EE5412 Telecommunication Networks or equivalent
Precursors: *(Course Code and Title)*	EE6412 Signaling, Switching and Routing in Telecommunication Networks; or equivalent
Equivalent Courses: *(Course Code and Title)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

This course aims to provide students with an understanding of the principles, protocols and performance evaluation techniques of various wired and wireless networks.

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.	Demonstrate the functions of different layers of OSI network model.		✓		
2.	Describe the latest MAC protocols and their applications in 802.11 and 3G networks.		✓	✓	
3.	Describe the latest routing protocols and their applications in Internet and wireless ad-hoc networks.		✓	✓	
4.	Identify the requirements and protocol design methods of practical wired and wireless networks.		✓	✓	✓
5.	Apply system management techniques to networks that use different networking technologies.		✓	✓	✓
		100%			

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	5		
Lecture	Principles, protocols and performance evaluation techniques of various wired and wireless networks are described and illustrated.	✓	✓	✓	✓	✓		3 hrs/wk
Case study	A representative network is selected as an example to demonstrate the design principles and performance evaluation techniques described in the lectures.			✓	✓	✓		
Course project	Students are encouraged to form a team and choose an advanced topic in the area of wired or wireless networking as their course project, and present his/her findings and ideas in class. Comments on their presentations will be provided so that they could better prepare for the final project reports.			✓	✓	✓		

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: 40%								
At least 3 assignments (course project etc.)		✓	✓	✓	✓		40%	
Examination: 60% (duration: 2hrs)								
							100%	

Remark:

To pass the course, students are required to achieve at least 30% in course work and 30% in the examination.

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 level
2. Coursework	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal level

6. Constructive Alignment with Programme Outcomes

PILO	How the course contribute to the specific PILO(s)
1, 2, 3	The course provides students with amble opportunities in acquiring knowledge of and evaluation of new networking technologies, and also the applications of mathematics and engineering problem solving skills which are central to the aims of this program.
4, 5	Students are required to complete a course project to gain practical experience in networking design and management. The analytical and practical skills developed are central to the aims of this course.

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

1. Keyword Syllabus

Computer Networks
Streaming multimedia, P2P file sharing, TCP and UDP, IPv6, multicast, CSMA/CD, ATM and MPLS.

Cellular Networks
Fading channel, CDMA, OFDMA, scheduling, handoff, mobility management.

Wireless LAN and Wireless Ad-hoc Networks
WiFi, CSMA/CA, QoS provisioning, DSDV, AODV, DSR, mobile IP, energy management.

Networks Management
System configurations, logging, notifications, upgrades with minimum service disruption, system management.

* some of the materials in Networks Management shall be delivered via mini-project, in the laboratory including telecommunications network management, and cloud computing infrastructure management.

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.	James F. Kurose and Keith W. Ross, *Computer Networking: A Top-Down Approach* (6th Edition), Pearson, 2013.

2.2 Additional Readings

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

1.	C. Siva Ram Murthy and B. S. Manoj, *Ad Hoc Wireless Networks: Architectures and Protocols*, Prentice Hall, 2004.
2.	Dimitri Bertsekas and Robert Gallager, *Data Networks* (2nd Edition), Prentice Hall, 1992.
3.	David Tse and Pramod Viswanath, *Fundamentals of Wireless Communication*, Cambridge University Press, 2005.
4.	Jeffrey G. Andrews, Arunabha Ghosh and Rias Muhamed, *Fundamentals of WiMAX*, Prentice Hall, 2007.
5.	Maria Toeroe and Francis Tam, *Service Availability: Principles and Practice*, Wiley, 2012.