City University of Hong Kong

Information on a Course
offered by Department of Computer Science
with effect from Semester A in 2012 / 2013

Part I

Course Title: Computer Networks and Internets

Course Code: CS5222

Course Duration: One Semester

Credit Units: 3

Level: P5

Medium of Instruction: English

Prerequisites: Nil

Precursors: Nil

Equivalent Courses: Nil

Exclusive Courses: Nil

Part II

Course Aims

The aims of this course is to (i) introduce the fundamental concepts of computer networks using the TCP/IP Model as a framework; (ii) develop understanding in the structure, operation, and application protocols of the Internet. Specifically this course

(i) introduces the concept of layered architecture in computer networks and the structure of the TCP/IP model;

(ii) covers the design issues in providing reliable transport of data in the lower protocol layers and the services provided in the higher layers;

(iii) examines the characteristics, technologies and current standards in local area networks;

(iv) covers the main protocol elements of the TCP/IP protocol suit;

(v) examines the structure, naming and routing aspects of the Internet;

(vi) examines some of the main Internet application protocols.

Course Intended Learning Outcomes (CILOs)
Upon successful completion of this course, students should be able to:

No.	CILOs	Weighting (if applicable)
1.	identify the fundamental technologies for the hardware and software of the internet;	
2.	describe the conceptual and implementation aspects of network applications and its use in most of the application layer protocols such as HTTP, SMTP and FTP;	
3.	investigate the implementation details on both reliable and unreliable services that can be provided by the transport layer protocol and to identify problems about the protocols;	
4.	identify and make critique on the underlying principles of routing algorithms and its related protocols being applied to the Internet;	
5.	describe the services, principle and specific protocol provided in Local area network.	

Teaching and Learning Activities (TLAs)
(Indicative of likely activities and tasks designed to facilitate students' achievement of the CILOs. Final details will be provided to students in their first week of attendance in this course)

Teaching pattern:
Suggested lecture/tutorial/laboratory mix: 2 hrs. lecture; 1 hr. tutorial.

ILO No	TLAs	Hours/week (if applicable)
CILO 1 to CILO 5	Lectures to introduce the basic concepts, design considerations and methodologies illustrated with case examples.	2 hours of lecture per week
CLO 1 to CILO 5	Tutorial sessions used for discussions and given problems related to the lecture topics.	1 hour tutorial per week
CILO 2	Various different protocols will be investigated and discovered using software protocol analyzer.	

Assessment Tasks/Activities

(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs. Final details will be provided to students in their first week of attendance in this course)

ILO No	Type of assessment tasks/activities	Weighting (if applicable)	Remarks
CILO 1 to CILO 5	Tutorials with short questions and assignments.		
CILO 1 to CILO 5	Examination.		
CILO 1 to CILO 3	Mid-term quiz.		

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

Examination duration: 2 hours

Percentage of coursework, examination, etc.: 30% CW; 70% Exam

Grading pattern: Standard (A+AA-…F)

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

Part III

Keyword Syllabus

Network architecture: layered architecture, service and protocols; Data transport services and protocols: elements of protocols, service specification; Local Area Networks: LAN topologies, medium access methods: CSMA/CD; LAN performance, access delays, throughput; LAN standards; Wide-area networks, network technologies, circuit, packet, cell switching; Routing algorithms, Internetworking, IP, routing in Internet, mobile IP; Transport layer issues: connection management, multiplexing, quality of service. TCP/UDP protocol suite; Congestion and flow control schemes; Socket communication, client-server communications; Domain name system; Application protocols, HTTP, SMTP, POP, SNTP.

Syllabus

1. Computer Network and the internet
2. Application Layer – HTTP, FTP, SMTP, DNS
3. Transport Layer – Multiplexing and Demultiplexing, UDP, TCP
4. Network Layer – Virtual Circuit and Datagram network, Router, Routing Algorithms
5. Link Layer – Error detection and correction techniques, Multple Access Protocol

Recommended Reading
Text(s)

Computer Networking - A Top down Approach featuring the Internet by James F Kurose and Keith Ross, Pearson International Edition

Supplementary Reading

Computer Networking and the Internet, Fred Halsall, Addison Wesley, ISBN 0321263588

Online Resources