Title (Units): **COMP7360 Enterprise Networking and Cloud Computing (3,3,0)**

Course Aims: To give students an in-depth knowledge of enterprise networking and cloud computing; to learn the techniques of Ethernet LANs, wireless LANs, MANs, and WANs for enterprise networking; to learn TCP/IP internetworking principles; to learn network security and network management; and to learn the architecture and services of cloud computing.

Prerequisite: Postgraduate Student Standing

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

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
1	Describe Ethernet LANs, wireless LANs, MANs, WANs, and TCP/IP internetworking
2	Identify common network security issues and the corresponding countermeasures
3	Describe the architecture and services of cloud computing
	Professional Skill
4	Design Ethernet LANs and wireless LANs for enterprises
5	Manage enterprise networks
6	Design and implement cloud computing for enterprises

Calendar Description: This course provides an in-depth knowledge of enterprise networking and cloud computing. Topics include Ethernet LANs, wireless LANs, MANs, WANs, TCP/IP internetworking, network security, network management, cloud computing architecture, cloud computing services, design and implementation of cloud computing.

Teaching and Learning Activities (TLAs):

CILOs	Type of TLA
1-6	Students will learn the enterprise networking and cloud computing technologies via lectures and assignments.

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
1	Continuous Assessment	40%	1-6	Continuous assessments are designed to measure how well the students have learned the basic techniques in enterprise networking and cloud computing.
2	Examination	60%	1-6	Final examination questions are designed to see how far students have achieved their intended learning outcomes.

Assessment Rubrics:

	Excellent (A)	Good (B)	Satisfactory (C)	Fail (F)
Ethernet LANs, wireless LANs, MANs, WANs, and TCP/IP internetworking	• Demonstrates thorough knowledge and understanding of key concepts of Ethernet LANs,	• Demonstrates sufficient knowledge and understanding of key concepts of Ethernet LANs,	• Demonstrates some knowledge and understanding of key concepts of Ethernet LANs, wireless LANs, MANs, WANs,	• Demonstrates limited knowledge and understanding of key concepts of Ethernet LANs,

	wireless LANs, MANs, WANs, and TCP/IP internetworking • Has a high degree of effectiveness and correctness in the design of Ethernet LANs and wireless LANs for enterprises	wireless LANs, MANs, WANs, and TCP/IP internetworking • Has a considerable degree of effectiveness and correctness in the design of Ethernet LANs and wireless LANs for enterprises	and TCP/IP internetworking • Has some degree of effectiveness and correctness in the design of Ethernet LANs and wireless LANs for enterprises	wireless LANs, MANs, WANs, and TCP/IP internetworking • Has limited degree of effectiveness and correctness in the design of Ethernet LANs and wireless LANs for enterprises
Network Security and Management	• Demonstrates thorough knowledge and understanding of key concepts of network security and management • Has a high degree of effectiveness in managing enterprise networks	• Demonstrates sufficient knowledge and understanding of key concepts of network security and management • Has a considerable degree of effectiveness in managing enterprise networks	• Demonstrates some knowledge and understanding of key concepts of network security and management • Has some degree of effectiveness in managing enterprise networks	• Demonstrates limited knowledge and understanding of key concepts of network security and management • Has a limited degree of effectiveness in managing enterprise networks
Cloud Computing	• Demonstrates thorough knowledge and understanding of key concepts of cloud computing architecture and services • Has a high degree of effectiveness in the design of cloud computing solutions for enterprises	• Demonstrates sufficient knowledge and understanding of key concepts of cloud computing architecture and services • Has a considerable degree of effectiveness in the design of cloud computing solutions for enterprises	• Demonstrates some knowledge and understanding of key concepts of cloud computing architecture and services • Has some degree of effectiveness in the design of cloud computing solutions for enterprises	• Demonstrates limited knowledge and understanding of key concepts of cloud computing architecture and services • Has a limited degree of effectiveness in the design of cloud computing solutions for enterprises

Course Content and CILOs Mapping:

Content		**CILO No.**
I	Ethernet Local Area Networks	1,4
II	Wireless Local Area Networks	1,4
III	Metropolitan Area Networks and Wide Area Networks	1
IV	TCP/IP Internetworking	1

V	Network Security and Management	2,5
VI	Cloud Computing Architecture	3
VII	Cloud Computing Services	3
VIII	Cloud Design and Implementation	6

References:

- William Stallings and Tom Case, Business Data Communications – Infrastructure, Networking and Security, 7th Edition, Pearson, 2013.
- Behrouz A. Forouzan, Data Communications and Networking, 5th Global Edition, McGraw-Hill Education, 2013.
- Michael J. Kavis, Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, & IaaS), Wiley, 2014.
- Thomas Erl, Ricardo Puttini, Zaigham Mahmood, Cloud Computing: Concepts, Technology and Architecture, Prentice Hall, 2014.

Course Content:

Topic

I. Ethernet Local Area Networks
   A. LAN topologies and transmission media
   B. Ethernet protocol architecture
   C. Switched Ethernet
   D. Spanning tree protocol
   E. Virtual LANs

II. Wireless Local Area Networks
   A. Properties of wireless networks
   B. IEEE 802.11 WLAN

III. Metropolitan Area Networks and Wide Area Networks
   A. SONET/SDH
   B. Metro Ethernet
   C. Leased line networks
   D. Frame relay and ATM

IV. TCP/IP Internetworking
   A. Internet protocol: IPv4 and IPv6
   B. Routing protocols
   C. Transport protocols
   D. Quality of service

V. Network Security and Management
   A. Network security
   B. Virtual private networks
   C. Network management

VI. Cloud Computing Architecture
   A. Overview of cloud computing
   B. Private, public, and hybrid clouds

VII. Cloud Computing Services
   A. Infrastructure as a service
   B. Software as a service
   C. Platform as a service
   D. Case studies: enterprise applications

VIII. Cloud Design and Implementation

A. Cloud design
B. Cloud implementation
C. Cloud management
D. Case studies