Course Number

- ICS 322

Course Title

- Data Communications and Computer Networks

Course Credit:

- 2 units

Delivery Method

- Hybrid (In-class and Online)

Course website

- http://myclass.myvirtuallearning.org
- myvle.slu.edu.ph

Course Coordinator

- Lambert P. Famorca

Course Description

It is the role of the IT professional to select, design, deploy, integrate, and administer network and communication infrastructures in an organization. This knowledge area includes data communications, telecommunications, inter/internetworking, and infrastructure security. It also includes application of networking to multimedia, information storage and distribution, the Internet and the World Wide Web.

Course Objectives

By the end of the course, students should be able to:

- Identify the communication channels and media used by various communication equipment in networking;
- Identify and understand the differences between the ISO Reference Model and the TCP/IP Reference Model;
- Identify and describe the importance of standards in in networking;
- Recognize and understand networking standards bodies and identify their roles;
- Identify various communication and terminal equipment used in networking;
- Identify, distinguish and explain the similarities and differences between LANs and WANs;
- Describe and identify the functions of the IEEE Networking Specifications;
- Design and configure a Local Area Network using a Network Simulator Tool;
- Design and configure a Wide Area Network using a Network Simulator Tool;
- Identify issues and services for the proper management of a Local Area Network;
- Discuss the needed security requirements for the proper implementation of a Local Area Network; and
- Prepare and Develop a Network Acceptable Policy.

Course Modules

1	Course Introduction
	• Course Objectives
	• Introductions and course logistics
	• Career Path for Network Professionals

2	Network Basics
	• Network Concepts
	• Network Architectures
	• Network Benefits and Concerns

3	Networking Standards and the OSI Reference Model
	• Networking Standards Organizations
	• The OSI Reference Model
	• Applying the OSI Reference Model
	• IEEE Networking Specifications

4	Transmission Basics and Networking Media
	• Transmission Basics
	• Media Characteristics
	• Type of Media
	• Cable Installation and Management

5	Topologies and Ethernet Standards
	• Physical Topologies
	• Logical Topologies
	• Hybrid Topologies
	• Backbone Networks
	• Switching and Ethernet

6	Introduction to TCP/IP Protocols
	• TCP/IP Protocol Suite
	• IPv4 and IPv6 Addressing
	• IP Address Management
	• Sockets and Ports
	• Host Names and Domain Name System (DNS)
	• Application Layer Protocols

7	Network Hardware and Components, Switching and Routing
	• Network Interface Cards (NICs)
	• Repeaters and Hubs
	• Switches, Bridges and Routers
	• Gateways

8	Wide Area Networks (WAN)
	• WAN Essentials
	• WAN Topologies
	• WAN Architectures
	• WAN Technologies

9	Wireless Networking
	• The IEEE 802 Networking Specification
	• Wireless Networking Standards
	• Wireless Networking Devices
	• Wireless Networking Configuration

10	Virtual Networks and Remote Access
	• Virtualization
	• Virtual Network Components
	• VLANs
	• Virtual Private Networks (VPNs)
	• Cloud Computing

11	Network Security
	• Security Threats
	• Threat Mitigation
	• Security Policies
	• Security in Network Design

12	Network Management
	• Fundamentals of Network Management
	• Network Integrity and Availability
	• Fault and Performance Management
	• Asset Management
	• Troubleshooting Network Problems

Assessment Tasks

Task No.	Assessment Task	Individual or Group	Weighting %	Delivery
1	Chapter Quizzes and Seatworks	Individual	30%	Hybrid
2	Term Examinations (Prelim, Midterm, Final)	Individual	60%	In-class
3	Research Works	Individual	5%	Hybrid
4	Project	Individual	5%	Hybrid
			100%	

Assessment Task 1 – Chapter Quizzes / Seatworks

Goal	For the student to demonstrate an understanding of the course content
Output	The students will be required to accomplish an End of Chapter (EoC) quiz and seatwork. The quiz will contain MCQ, True or False, Short Answer and Matching Type questions. The seatwork will be a design and analysis type of exercise. The quiz and seatwork will focus on lectures, readings and course materials.
Format	This is an individual assessment
Criteria	• Understanding of network knowledge as discussed in class • Application of network concepts as discussed in class

Assessment Task 2 – Term Examinations

Goal	For the student to demonstrate an understanding of the course content
Output	The students will be required to accomplish Term Examinations (Prelim, Midterm, Final). The exam will contain MCQ, True or False, Short Answer and Matching Type questions. The exam will focus on lectures, readings and course materials covered during the Term.
Format	This is an individual assessment
Criteria	• Understanding of network knowledge as discussed in class • Application of network concepts as discussed in class

Assessment Task 3 – Research Works

Goal	For the student to demonstrate an understanding of research
Output	The students will be required to utilize library services in creating a report on current networking practices. The report should include a list of networking research topics, its corresponding URL and a reflection of the selected topic.
Format	This is an individual assessment
Criteria	• Understanding of network research topics • Understanding of best practices in network management • Utilization of available University library services

Assessment Task 4 – Project

Goal	For the student to demonstrate the ability to design networks according to business requirements
Output	Using the University as a case study, students are required to prepare a complete Network Plan for the University. The Plan should include network management, security requirements and acceptable use policies.
Format	This is an individual assessment
Criteria	- Application of network management and security concepts - Critical analysis and evaluation of network management and security requirements - Design and configure networks to meet and satisfy network management and security requirements - Design and prepare a revised University Acceptable Use Policy - Written communication skills

Grading Policy:

University policies on attendance will be implemented. Three Periodic Grades (prelim-PG, midterm-MG, and tentative final grade-TFG) and a final grade-FG will be given to the student.

Where:

$$FG = (PG+MG+TFG)/3$$

PG, MG and TFG are computed based on students' scores on activities for the prelim period, midterm period, and final period respectively. The scores are proportionately rated based on a 50-100 grade scale through the formula

Grade = ((Student's Score)/(Perfect Score))*50+50

A PG, MG or FG that is lower than or equal to 65 is set to 65 and a PG, MG or FG that is equal to 100 is set to 99.

The grade that appears on the pink grade form issued by the registrar's office is final. Unless the student can present concrete evidences that the grade computation is erroneous, the final grade cannot be changed. If necessary, request for correction of grade must be done by the student himself/herself. (The student should bring his/her compilation of his/her examination/quiz papers to the instructor when the latter is available for consultation in the faculty room. Phone calls and visits to the faculty's residence by the student for the purpose of grade verification will not be entertained.)

Methodologies/Strategies:

Lecture
Seatwork
Examinations
Home works
Case Studies
Research Work
Forum
Online Quizzes

Other Course Policies:

Academic Integrity

Academic Honesty
Course Honor Code
Any form of cheating is not allowed in the course. A student who cheats will be given the grade 65, a failing grade, on the quiz/exam/requirement for which cheating is done. (See student handbook).

The following describes what are considered acts of cheating for the course.
1. Opening of notes, books and the like during classroom tests regardless of whether the student was able to copy from the material or not, unless the instructor explicitly;
2. Making glances at classmates' papers/copying from classmates' paper during tests is cheating.
3. Making glances at classmates' monitor during tests is cheating.
4. During examinations, it is any student's responsibility to guard his/her paper's accessibility to his/her classmates. Any student who willfully lets her answers be copied by other students will be subjected to the same penalty as the cheaters.
5. Using communication paraphernalia such as cellular phones, tablets, and the like during examinations is considered cheating.
6. Copying/ sharing outputs for any homework or project are considered cheating.
7. Writing notes on walls, chairs, floor, dress, body and the like for purposes of classroom exams.

Course Outline and Schedule

Level	Particulars	P/M/F	Target Duration	
			Hours	Minutes
1	Course Introduction	Prelims	1	
	1.1 Course Objectives		0	25
	1.2 Introductions and course logistics		0	25
	1.3 Career Path for Network Professionals		0	10
2	Network Basics	Prelims	4	30
	2.1 Types of Networks		1	30
	2.2 Elements of Typical Client/Server Networks		0	30
	2.3 Uses of Networks		0	30
	2.4 Network Benefits and Concerns		0	30
	2.4 Network Architectures		0	30
	End of Chapter Quiz and Seatwork		1	0
	Research Work			
3	Networking Standards and the OSI Reference Model	Prelims	6	0
	3.1 Networking Standards Organizations		1	0
	3.2 The OSI Reference Model		2	0
	3.3 Applying the OSI Reference Model		1	0
	3.4 IEEE Networking Specifications		1	0
	End of Chapter Quiz and Seatwork		1	0
4	Transmission Basics and Networking Media	Prelims	5	30
	4.1 Transmission Basics		0	30
	4.2 Media Characteristics		1	30
	4.3 Type of Media		1	30
	4.4 Cable Installation and Management		1	0
	End of Chapter Quiz and Seatwork		1	0
	Research Work			
5	Topologies and Ethernet Standards	Prelims	6	0
	5.1 Physical Topologies		0	30
	5.2 Logical Topologies		0	30
	5.3 Hybrid Topologies		0	30

	Topic	Term		
	5.4 Backbone Networks		0	45
	5.5 Switching and Ethernet		0	45
	End of Chapter Quiz and Seatwork		1	0
	Preliminary Examination		2	0
6	Introduction to TCP/IP Protocols	Midterm	6	30
	6.1 TCP/IP Protocol Suite		0	30
	6.2 IPv4 and IPv6 Addressing		1	30
	6.3 IP Address Management		1	30
	6.4 Sockets and Ports		0	30
	6.5 Host Names and Domain Name System (DNS)		0	30
	6.6 Application Layer Protocols		1	0
	End of Chapter Quiz and Seatwork		1	0
	Research Work			
7	Network Hardware and Components, Switching and Routing	Midterm	5	0
	7.1 Network Interface Cards (NICs)		0	30
	7.2 Repeaters and Hubs		1	30
	7.3 Switches, Bridges and Routers		1	30
	7.4 Gateways		0	30
	End of Chapter Quiz and Seatwork		1	0
8	Wide Area Networks (WAN)	Midterm	4	0
	8.1 WAN Essentials		1	0
	8.2 WAN Topologies		0	45
	8.3 WAN Architectures		0	45
	8.4 WAN Technologies		0	30
	End of Chapter Quiz and Seatwork		1	0
9	Wireless Networking	Midterm	6	0
	9.1 The IEEE 802 Networking Specification		1	0
	9.2 Wireless Networking Standards		0	45
	9.3 Wireless Networking Devices		0	30
	9.4 Wireless Networking Configuration		0	45
	End of Chapter Quiz and Seatwork		1	0
	Research Work			
	Midterm Examination		2	0
10	Virtual Networks and Remote Access	Finals	6	0
	10.1 Virtualization		1	30
	10.2 Virtual Network Components		0	30
	10.3 VLANs		1	0
	10.4 Virtual Private Networks (VPNs)		1	30
	10.5 Cloud Computing		0	30
	End of Chapter Quiz and Seatwork		1	0
11	Network Security	Finals	5	0
	11.1 Security Threats			30
	11.2 Threat Mitigation			30
	11.3 Security Policies		1	30
	11.4 Security in Network Design		1	30
	End of Chapter Quiz and Seatwork		1	0
	Research Work			
12	Network Management	Finals	9	30
	12.1 Fundamentals of Network Management		1	30
	12.2 Network Integrity and Availability		0	30

12.3 Fault and Performance Management		1	30
12.4 Asset Management		0	30
12.5 Troubleshooting Network Problems		1	30
End of Chapter Quiz and Seatwork		1	0
Final Examination		2	0