



ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL
Faculty of Electrical and Computer Engineering
COURSE SYLLABUS
Data Networks I

1. CODE AND NUMBER OF CREDITS

CODE	FIEC04978	
NUMBER OF CREDITS : 4	Theoretical: 4	Practical: 0

2. COURSE DESCRIPTION

This course offers knowledge integration related with communications systems protocols, architecture, addressing and design. The different flow control, media access and error detection techniques are analyzed. The routing protocols, transport protocols and network media access are compared. The student analyzes different technologies, such as, Frame Relay, ATM, SONET, SDH and MPLS. At the end of the course, the student should be prepared to design networks, efficiently address it and select the adequate technology depending on the economic and technical aspects.

3. PRE-REQUISITES AND CO-REQUISITES

PRE-REQUISITES	FIEC04960 DIGITAL COMUNICACIONES
CO-REQUISITES	

4. CORE TEXT AND OTHER REQUIRED REFERENCES FOR THE TEACHING OF THE COURSE

CORE TEXT	1. Stallings W., Data and Computer Communications, Prentice Hall, 2006, Eight Edition
REFERENCES	1. Forouzan B., Data Communications and Networking, McGraw Hill, 2006. 2. Tomasi W., Introduction to Data Communications and Networking, Prentice Hall, 2005. 3. Wang H., Packet Broadband Network Handbook, McGraw Hill, 2003 4. Bates R. & Bates W., Principles of Voice and Data Communications, Career Education, 2006. 5. Beasley J., Networking, New Riders Press, 2008 6. Olifer N. & Olifer V., Computer Networks: Principles, Technologies and Protocols for Network Design, Wiley, 2006

5. COURSE LEARNING OUTCOMES

At the end of the course, the student will be able to:

- Expose the students to the basic principles and design of data and communication network systems

6. COURSE PROGRAM

- I. Networks Introduction (2 sessions - 4 hours)
 - Technology Impact
 - Network's elements
 - Communication's schemes
- II. Protocols and Architecture (2 sessions - 4 hours)
 - Communication's Protocols
 - Communication's Standard
 - HTTP/TCP/IP/Ethernet Protocol Stack
 - OSI Reference Model
 - TCP/IP Model
- III. Application Layer (2 sessions - 4 hours)
 - SMTP and POP
 - HTTP and DNS



- Telnet and SSH
- DHCP
- IV. Transmission Layer (2 sessions - 4 hours)
 - TCP
 - UDP
- V. Packet switching (6 sessions - 12 hours)
 - Routed Protocols IPv4 and IPv6
 - Routing Protocols
 - Network Addressing
- VI. Data Link (5 sessions - 10 hours)
 - Switching types
 - Communication types
 - Error detection and correction
 - Flow control
- VII. Queuing Theory (2 sessions - 4 hours)
 - Queuing Theory Elements
 - Poisson Process
 - Queue M/M/1
 - Little Formula
 - Birth-Death Process
 - Queue M/G/1
- VIII. Transmission Media (2 sessions - 4 hours)
 - Copper cable
 - Optic Fiber
 - Wireless media
- IX. LAN Transmission Technologies (2 sessions - 4 hours)
- X. WAN Transmission Technologies (3 sessions - 6 hours)

7. WORKLOAD: THEORY/PRACTICE

Sessions per week: two (2)
Hours per session: two (2) hours

8. CONTRIBUTION OF THE COURSE TO THE EDUCATION OF THE STUDENT

This course is oriented to engineering design

BASIC TRAINING	PROFESSIONAL TRAINING	SOCIAL SKILLS DEVELOPMENT
	X	

9. THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES OF THE COURSE AND THE LEARNING OUTCOMES OF THE DEGREE PROGRAM

LEARNING OUTCOMES OF THE DEGREE PROGRAM*	CONTRIBUTION (High, Medium, Low)	LEARNING OUTCOMES OF THE COURSE**	THE STUDENT MUST:
a) An ability to apply knowledge of mathematics, science and engineering	High	1	Realize network division calculations and protocol analysis
b) An ability to design and conduct experiments, and to analyze and interpret data			
c) An ability to design a system, component or process to satisfy realistic constraints			
d) An ability to function on multidisciplinary teams			
e) An ability to identify,			



formulate and solve engineering problems			
f) An understanding of ethical and professional responsibility			
g) An ability to communicate effectively			
h) A broad education necessary to understand the impact of engineering solutions in a social, environmental, economic and global context			
i) A recognition of the need for, and an ability to engage in life-long learning			
j) A knowledge of contemporary issues			
k) An ability to use the techniques, skills, and modern tools necessary for engineering practice			
l) Capacity to lead, manage and undertake projects			

10. EVALUATION IN THE COURSE

Evaluation activities	
Exams	X
Tests	X
Homework/tasks	
Projects	
Laboratory/Experiments	
Class participation	
Visits	
Other	X

11. PERSON RESPONSIBLE FOR THE CREATION OF THE SYLLABUS AND THE DATE OF ITS CREATION

Created by	Patricia Chavez MSEE
Date	05/Mar/2013

12. APPROVAL

ACADEMIC SECRETARY OF THE ACADEMIC DEPARTMENT	DIRECTOR OF TECHNICAL ACADEMIC SECRETARY
NAME: Mrs. Leonor Caicedo G.	NAME: Eng. Marcos Mendoza
SIGNATURE: 	SIGNATURE:
Date of approval by the Directive Council: 2013-537 2013-10-7	<p>ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL</p> <p>----- Ing. Marcos Mendoza V. DIRECTOR DE LA SECRETARÍA TÉCNICA ACADÉMICA</p>



13. VALIDITY OF THE SYLLABUS

RESOLUTION OF THE POLYTECHNIC BOARD:	13-12-343
DATE:	2013-12-12