

University of Puerto Rico
 Mayagüez Campus
 College of Engineering
 Department of Electrical and Computer Engineering
 Bachelor of Science in Electrical Engineering

Course Syllabus

1. General Information:	
Alpha-numeric codification: INEL 4307 Course Title: Communication between Computers Number of credits: 3 Contact Period: 3 hours of lecture per week Electives in INEL and ICOM	
2. Course Description:	
English: Computer network organization. Characteristics of voice grade channels used for digital communication. Synchronization and multiplexing. Information codes and interfacing standards and protocols. Data encryption techniques. Distributed computing and local area networks. Spanish: Características de los canales de voz que se utilizan para la comunicación digital. Sincronización y múltiplex. Claves de información, normas de interconexión y protocolos de comunicación. Técnicas para encifrar datos. Computación distribuida y redes locales	
3. Pre/Co-requisites and other requirements:	
Prerequisite INEL 4301, INEL 4206 and (ININ 4010 or ININ 4011).	
4. Course Objectives:	
To introduce the techniques and standards used in computer communications including: the OSI layered model, modulation and demodulation techniques, physical, link, network, and transport-layer protocols, including the TCP architecture.	
5. Instructional Strategies:	
<input checked="" type="checkbox"/> lecture <input type="checkbox"/> discussion <input type="checkbox"/> computation <input type="checkbox"/> laboratory <input type="checkbox"/> seminar with formal presentation <input type="checkbox"/> seminar without formal presentation <input type="checkbox"/> workshop <input type="checkbox"/> art workshop <input type="checkbox"/> practice <input type="checkbox"/> trip <input type="checkbox"/> thesis <input type="checkbox"/> special problems <input type="checkbox"/> tutoring <input type="checkbox"/> research <input type="checkbox"/> other, please specify:	
6. Minimum or Required Resources Available:	
Materials, equipment, and physical facilities needed to fulfill the course objectives.	
7. Course time frame and thematic outline	
Outline	Contact Hours
Introduction to computer communications	1
Protocols and protocol architecture	4
Data communications: properties, models, techniques	15
Wide Area Networks: architectures and techniques	12
TCP/IP	6
Local Area Networks: architecture and techniques	4
Exams	3
Total hours: (equivalent to contact period)	45
8. Grading System	
<input checked="" type="checkbox"/> Quantifiable (letters) <input type="checkbox"/> Not Quantifiable	
9. Evaluation Strategies (Suggested): The faculty member teaching the course will provide the student with	

the evaluation strategy he/she will be using throughout the semester. This will be done within the first week of classes.

	Quantity	Percent
<input checked="" type="checkbox"/> Exams	3	60%
<input checked="" type="checkbox"/> Final Exam	1	20%
<input type="checkbox"/> Short Quizzes		
<input type="checkbox"/> Oral Reports		
<input type="checkbox"/> Monographies		
<input type="checkbox"/> Portfolio		
<input type="checkbox"/> Projects		
<input type="checkbox"/> Journals		
<input checked="" type="checkbox"/> Other, specify: Homework	Varies	20%
TOTAL:		100%

10. Bibliography:

Stallings, William, Data and Computer Communications, 8th Edition, Pearson Prentice-Hall, 2007

11. According to Law 51

Students will identify themselves with the Institution and the instructor of the course for purposes of assessment (exams) accommodations. For more information please call the Student with Disabilities Office which is part of the Dean of Students office (Chemistry Building, room 019) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.

12. Contribution of Course to meeting the requirements of Criterion 5:

Math	Basic Science	General	Engineering Topic
			✓

12. Course Outcomes

Map to ABET Outcomes

- Understand and explain the architecture of computer communications using the OSI Reference Model, the specifications of protocols, and technical literature in the field. In addition, the student should be capable of making simple design decisions on network topology, and participate in the design and implementation of computer communication protocols. (i)
- Identify the theoretical limitations of communication systems using Nyquist and Shannon-Hartley theorems. (a)
- Understand and make informed decisions about selecting the appropriate transmission medium and coding technique for data communications. (c)
- Understand and explain the principles of framing a protocol data unit, flow and error control across a digital data link. (a)
- Evaluate the performance of data link protocols in terms of utilization, net throughput, and latency. (a)
- Describe and classify computer communication networks according to geographical extension (WAN vs LAN), topology and switching technique: circuit switching, packet switching using virtual circuits, datagrams, or cells. (c)
- Understand how routing functions are implemented in Wide Area Networks including the use of least cost algorithms (Bellman-Ford and Dijkstra) and flooding. (a)
- Understand and apply the fundamental principles of the IP and TCP layers in WAN. (a)
- Understand the organization and nomenclature of the local area network based on the IEEE802 standards family and their scope. (i)
- Understand and explain how network stations exercise media access control under IEEE802.3 and IEEE802.11 sections of the standard. (a)

Person (s) who prepared this description and date of preparation: Jorge Cruz Emeric. Submitted by: Miguel Vélez, Julio 07.