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

Course Syllabus

1. General Information:

Alpha-numeric codification: ICOM/INEL 5318
Course Title: Intermediate Routing, Switching, and Wide Area Networks
Number of credits: 3
Contact Period: 3 hours of lecture per week

2. Course Description:

English: Link state routing protocols and intermediate level concepts such as switching, wide area networks or WAN standards, virtual local area networks or VLAN, network design, and redundancy will be studied and configured. Strategies for managing and saving address space such as variable length subnet masks and network address translation will also be introduced and studied.

Spanish: Se estudiará y configurará protocolos de enrutamiento tipo estado del enlace y conceptos de nivel intermedio como conmutación, estándares de redes de área amplias o "WAN", redes de area local virtuales o "VLAN" , diseño de redes y redundancia. Se presentará y estudiará además estrategias para manejar y ahorrar espacio de direcciones como submáscaras de largo variable y traducción de direcciones de red.

3. Pre/Co-requisites and other requirements:

Prerequisites: ICOM/INEL 4308 Networking and Routing Fundamentals or equivalent

4. Course Objectives:

After sucessfully completing this course, the student will be able to: Design, configure, and troubleshoot a local area network to satisfy the requirements of a small to medium size company making sure the design is efficient, scalable, accessible, and secure.

5. Instructional Strategies:

☒conference ☒discussion ☐computation ☒laboratory

☐seminar with formal presentation ☐seminar without formal presentation ☐workshop

☐art workshop ☐practice ☐trip ☐thesis ☐special problems ☐tutoring

☐research ☐other, please specify:

6. Minimum or Required Resources Available:

Access to a computer lab is required in order to administer the online assessments. A working computer projector and a working computer are required in the classroom. A computer projector is also required in the lab. The networking lab requires at least six (6) routers, at least three (3) switches, and at least six (6) computer workstations. The routers need a minimum of one (1) FastEthernet interface and two (2) type V.35 serial cable interfaces. The routers need the capacity to run several routing protocols such as RIP v1 and v2, EIGRP, IS-IS, BGP, and OSPF and to handle at least the 801.1q standard. The

switches must be able to handle at least the 801.1q standard and have no less than 12 ThinEthernet and two (2) FastEthernet LAN interfaces.

7. Course time frame and thematic outline

Outline	Contact Hours
Classless Routing	2
Routing Protocols	3
Special Areas and Considerations	6
Switching Concepts and configuration	3
Virtual Local Area Networks	2
Scaling IP Addresses	3
WAN Technologies	3
WAN Design	2
WAN Standards	10
Introduction to Network Administration	5
Exams	6
Total hours: (equivalent to contact period)	

8. Grading System

☒ Quantifiable (letters) ☐ Not Quantifiable

9. Evaluation Strategies

	Quantity	Percent
☒ **Exams**	**At least 3**	**40**
☒ **Final Exam**	**1**	**20**
☐ **Short Quizzes**		
☐ **Oral Reports**		
☐ **Monographies**		
☐ **Portfolio**		
☒ **Projects**	**2**	**10**
☐ **Journals**		
☒ **Other, specify: Practical Exam**	**2**	**30**
TOTAL:		**100%**

10. Bibliography:

Peterson, Larry L., and Davie, Bruce B., (2003) Computer Networks: A Systems Approach 3rd Edition. San Francisco, CA: Morgan Kaufmann Publishers.

Comer, Douglas, (2004) Computer Networks and Internets with Internet Applications 4th Edition. Upper Saddle River, NJ. Prentice Hall

Tannenbaum, Andrew, (2003) Computer Network 4th Edition. Upper Saddle River, NJ, Prentice Hall PTR

Kurose, James F., and Ross, Keith W., (2004) Computer Networking : A Top-Down Approach Featuring the Internet 3rd Edition. Addison Wesley.

Stallings, William, (2004) Data and Computer Communications 7th Edition. Upper Saddle River,

NJ, Prentice Hall

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. Course Outcomes	**Map to Program Outcomes**
1. Divide a major network into subnets of different sizes using VLSM.	(a)
2. Configure networking devices using concepts introduced or enhanced in this course.	(c)
3. Verify and troubleshoot routing protocols operation	(e)
4. Apply and troubleshoot key concepts, methods, and issues associated with routing and WANs	(c)