

Department of Electrical and Computer Engineering
Faculty of Engineering and Architecture
American University of Beirut
Course Information

Course title: Internet Engineering

Course number: EECE 651

Catalog description:

A course that provides an in-depth coverage of the Internet architecture, internet protocols, routing, router design; discusses recent developments on the Internet such as IPv6, IP switching, and mobile IP; and gives a detailed study of TCP.

Credit hours: 3 credits

Required or elective:

Elective for CCE / ECE students

Prerequisites:

By course: EECE 450 – Computer Networks

By topic: Basic concepts in networking and TCP/IP. Basic algorithms.

Textbook(s) and/or required materials

D. Comer, *Internetworking With TCP/IP, Volume 1: Principles Protocols, and Architecture*, 5th edition, 2006.

References:

- D. Medhi and K. Ramasamy, *Network Routing*, Morgan Kaufmann, 2007.
- M. Hassan and R. Jain, *High Performance TCP/IP Networking: Concepts, Issues, and Solutions*, Prentice-Hall, 2003.
- G. Varghese, *Network Algorithmics*, Morgan Kaufmann, 2004.

Course Objectives

<i>The objectives of this course are to:</i>	<i>Correlates to program objectives</i>
1. Present students with a study of the design, operation, and challenges of the Internet as a global network.	1,2,4
2. Provide students with advanced insight into addressing, routing, and performance on the Internet, and understand recent developments such as IPv6 and mobility.	1,2,4
3. Prepare students for research in the area of internet engineering	1,2
4. Enhance students communication and team work skills	1,3

Course Topics

No.	Subjects covered	75 min. lectures
1	Internet Architecture	2
2	Internet Protocols	5
3	Routing	3
4	Router Design	2
5	IP Switching	3
6	IPv6	2
7	Mobility	2
8	TCP	6

Course Learning Outcomes

At the end of the course, students:	Correlates to program outcomes*		
	H	M	L
1. Are able to describe the architecture of the Internet	(a) (o)		
2. Are able to describe the advanced functions performed by the Internet Protocol (IP) and supporting protocols (eg. ICMP, UDP)	(a) (o) (k)		
3. Are able to describe IP addressing and are able to design an internetwork with assigned addresses and NAT	(a) (o) (e) (k)		
4. Are able to describe the inner workings of interior routing protocols (eg. RIP and OSPF)	(a) (o)		
5. Are able to describe the operation of BGP and how routing on the global Internet behaves	(a) (o)		
6. Are able to describe the functions performed by routers	(a) (o)		
7. Are able to optimize the design of routers for performance	(a) (o) (e) (k)		
8. Are able to describe IP switching and the operation of MPLS	(a) (o)		
9. Are able to describe IPv6 and its new format and addressing schemes	(a) (o)		
10. Are able to describe the challenges involved in supporting mobility on the Internet and the possible solutions	(a) (o) (e)	(j)	
11. Are able to describe the operation of TCP and its advanced features.	(a) (o) (k)		
12. Are able to measure and optimize the performance of TCP	(a) (o) (e) (k)		
13. Are able to conduct research in the field of internet engineering	(a) (i)	(j)	
14. Are able to function in a team	(d)		
15. Are able to communicate efficiently	(g)		

* H: High correlation, M: Medium correlation, L: Low correlation

Class/laboratory schedule

Two 75-minute lectures per week.

Resources of the course

Textbook, Moodle, paper reading list.

Computer usage

Network analysis tools

Evaluation methods

1. Final exam		30%
2. Research paper		30%
Literature review	12%	
Final paper	18%	
3. Project		30%
Progress report	10%	
Presentation	10%	
Final report	10%	
4. Class participation		10%

Professional component

Engineering topics: 100%

General education: 0%

Mathematics and basic sciences: 0%

Person(s) who prepared this description and date of preparation

Ayman Kayssi, September 2009

Date of last revision

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