COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CMPE 457 / Data communication and computer networks II

Spring 2023

Instructor Information

Name: Dr. Mohamed Mahmoud
Academic title : Associate Professor
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Office Hours:

- Sundays and Tuesdays, 10:00 am to 12:00 pm.

TA Information

TBD

Class/Laboratory Schedule

Sundays, Tuesdays, Thursdays, C07 – 248
L53: 8 am to 8:50
L51: 9 am to 9:50

Coordinator Information

Course Information

Catalog Description:
Builds upon fundamental knowledge and concepts addressed in the "Data Communications and Computer Networks I" course. Signal modulation, coding techniques; wireless transmission; radio frequency, multiplexing, circuit and packet switching, medium access control; interior and exterior routing protocols, autonomous systems, link state routing; IPv6 address space, transmission methods from IPv4 to IPv6; network and internet security, VPN, cryptography, encryption schemes, firewalls, intrusion detection; congestion control, quality of service; protocols for network management; network socket programming.

Credits: 3 (3 hours theory)

Contact Hours: 3 (3 hours theory)

Prerequisites: CMPE 455 Data communication and computer networks I

Textbook(s):

1. Data Communications and Networking, 5th Edition, Behrouz A. Forouzan, McGraw-Hill, 2013

References:

1. CISCO-CCNA #2 exploration course material from NetAcad program. Available at http://cisco.netacad.net
2. Computer Networks and Internets, 4th Ed., Douglas E. Comer, Prentice Hall 2001 (ISBN-13: 978-013-123627-1) (http://www.netbook.cs.purdue.edu/)

Course Objectives:

1. Understand the design principles of the Internet model with emphasis on application, transport, internet and routing protocols.
2. Understand the design principles of network programming and security.

Course Learning Outcomes (CLO):

CO-CMPE457-1. Discuss the basic principles of signals, digital, and analog communications.
CO-CMPE457-2. Identify concepts and techniques that involve data link and medium access control as part of the data link layer, including, framing, flow, and error control, random access, reservation, and channelization protocols.
CO-CMPE457-3. Identify the detailed characteristics of common dynamic routing protocols, such as RIP, EIGRP, and OSPF protocols.
CO-CMPE457-4. Develop network programs using the socket interface in accordance with the client-server communication model.
CO-CMPE457-5. Work in a group of students on an assignment relevant to the course that involves several activities, including; survey, software development, and oral presentation.

Relationship of Course Outcomes to "a" to "k" ABET Outcomes:

Course Learning Outcomes (CLO)	Related Student Outcomes (SO)						
	1	2	3	4	5	6	7
1	√						
2	√	√					
3	√	√					
4	√	√					
5	√	√	√		√	√	√

Student Outcomes (SO)

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topics Covered:

Topics	Chapters in the textbook
Introduction to internet protocol suite	1,2
Data and signals	3
Digital transmission	4
Analog Transmission	5
Data link control	11
Multi access control	12
Dynamic routing protocols	
Security and cryptography	

Method of Instruction

In-class lectures, with sessions of open discussions.

Assessment Methods and Grading Policy

Quiz : 15% (best 3 out of 4 quizzes)
Homeworks : 10% (2 homeworks)
Project : 20% (development based)
Midterm exam : 20% (March 26th, at the lecture time)
Final exam : 25% (scheduled by the university)
Attendance : 10%

ABET Contribution of Course to Professional Component

Math & Basic Science : 20%
Engineering : 50%
Engineering Design : 25%
General Education : 5%

Computer/Software Usage

Laboratory Projects

N/A

Course Ground Rules

- **Late assignment submissions will be penalized 25% per late day.**
- **ClassWeb** Page: - All handouts and class notes will be published on the blackboard class web page (http://mybb.qu.edu.qa/). You are expected to check this page frequently (at least twice a week).
- **Email Communication:** In order to receive the highest priority, you must include the keyword [**CMPE 457 – Data Communication and Computer Networks II**] in the subject line of your email messages, and preferably send your questions to everyone in class.
- If you need a copy of Visual C++ ver. 6.0, you can contact the lab assistants (Mr. Ayman Zayan for boys, and Ms. Fatima for girls). Other tools for assignments maybe provided.
- Not attending any scheduled test or exam means that you will not have the mark of this exam unless there is an official documentation provided.
- Students are not allowed to be late for the lectures; you have to be on time and prepared well for any question.
- Chatting, and phone rings are not allowed in the lecture.

Support for Students with Special Needs

It is Qatar University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their Instructor to ensure that their individual needs are met. The University through its Special Needs Section will exert all efforts to accommodate for individuals' needs.
Contact Information for Special Needs Section:
Tel-Female: (00974) 4403 3843

Tel-Male: (00974) 4403 3854
Location: Student Activities Building
Email: specialneeds@qu.edu.qa

Academic Support and Learning Resources

The University Student Learning Support Center (SLSC) provides academic support services to male and female students at QU. The SLSC is a supportive environment where students can seek assistance with academic coursework, writing assignments, transitioning to college academic life, and other academic issues. SLSC programs include: Peer Tutoring, the Writing Lab, Writing Workshops, and Academic Success Workshops. Students may also seek confidential academic counseling from the professional staff at the Center.

Contact Information for Students Support and Learning Resources:
Tel: (00974) 4403 3876
Fax: (00974) 4403 3871
Location: Female Student Activities Building
E-mail: learningcenter@qu.edu.qa

Student Complaints Policy

Students at Qatar University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

Declaration

This syllabus and contents are subject to changes in the event of extenuating circumstances. The instructor (with approval of the Head of Department) reserves the right to make changes as necessary. If changes are necessitated during the term of the course, the students will be notified by email communication and posting the notification on the online teaching tool Blackboard. It is the student's responsibility to check on announcements made while they were absent.

Faculty Name: Mohamed Mahmoud
Last Modified: January 2023
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