COLLEGE OF ENGINEERING
Computer Science and Engineering

CMPS 485 Computer Security
Fall 2018

Instructor Information

Dr. Abdelkarim Erradi
Assistant Professor
Office: 132 Female Engineering Building
Phone: 4403 4254
Email: erradi@qu.edu.qa
Office Hours:

- Female - **Tuesday 9am to 10am** at my office
- Male - **Tuesday 12:15 to 1:15pm** at CSE Meeting Room BCR-E104
- Other times are available **by appointment only** on Sunday or Tuesday before 2pm

TA Information

Name:
Office:
Phone:
E-mail:
Office Hours:

Class/Laboratory Schedule

L01 - MW 8:00 am - 9:20 am @ BCR - C201
L51 - UTR 8:00 am - 8:50 am @ C07 - 0237

Coordinator Information

See instructor information above

Course Information

Catalog Description:
Fundamentals of information security. Risks and vulnerabilities, controls and protection methods, cryptography, authentication, host-based and network-based security issues, legal and ethical implications.

Credits:
3 Credit hours

Contact Hours:
3 Lecture hours

Prerequisites:
CMPE 355

Textbook(s):
None

References:
Online resources as specified by the instructor.

Course Objectives:

- Analyze problems using a security mindset.
- Secure and defend computer systems and networks.
- Provide a broad enough security background to allow students to make informed analysis of security products, news reports, etc. that they are likely to encounter in a work environment.

Course Learning Outcomes (CLO):

1. Demonstrate an understanding of the basic principles of symmetric key cryptography, asymmetric key cryptography, operating modes, and hashing.
2. Analyze and assess the security of a system through direct interaction with it.
3. Work in a team to examine and analyze a self-chosen security topic and effectively communicate it verbally and in writing.
4. Make informed computer security judgments based on legal and ethical principles and identify global impacts of security on individuals, organizations and society.

Relationship of Course Outcomes to Student Outcomes (SO):

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

CS Student Outcomes (CS-SO)

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

CE Student Outcomes (CE-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	**Chapter***	**Section***	**Weeks**
Cryptography			4
Authentication & Authorization			2
Network Security: Port scanning, Network attacks, Protecting the Network			3
Web Security			2
Ethics and Legal Issues			1
Recent Cybersecurity Incidents and their Impacts			1
Student Presentations			1
Total			**14**

*Optional

Method of Instruction

The course is taught through lectures, examples, demos and hands-on assignment. The approach adopted is learning by working on hands-on exercises to reinforce the concepts introduced in the lectures.

Learning Activities

To achieve the objectives of the course, students will carry out several learning activities:

1. **Readings**: The lectures will follow the topics listed in the course detailed schedule. The students are expected to read the assigned online resources and slides. The assigned reading will elaborate on information presented in the lectures. **Each student is responsible for reading all related material prior to each lecture.** This is a senior-level course and students are expected to learn independently as much as needed in order to complete the course requirements.

2. **Lectures**: students are expected to attend every lecture; this is where the course material will be discussed and ambiguities clarified. Class participation is highly encouraged. The tools to be applied in the assignments will be presented in the lectures via examples and demos. There are no labs for this course but students are required to practice and extend the examples and the demos provided.
3. **Homework assignments**: Assignments will be given so that students practice and apply the material covered in class.
4. **Exams:** Quizzes, midterm and the final exams assess the students' learning gained from the course.
5. **Review paper & Presentation**: Students will explore in more depth a security related topic then presents their findings to the class.

Assessment Methods and Grading Policy

Quizzes	=	15% (5 Quizzes)
Homework	=	20% (4 homework assignments)
Review paper & Presentation	=	20%
Midterm	=	20%
Final exam	=	25%

ABET Contribution of Course to Professional Component

Math & Basic Science	: 30%
Engineering	: 40%
Engineering Design	: 10%
General Education	: 20%

Computer/Software Usage

Kali Linux (Penetration Testing toolkit)
Nmap port scanner
aircrack-ng suite
Wireshark
Java or Python programming language (student choice)

Laboratory Projects

None.

Course Ground Rules

Attendance Policy:

- University attendance policies will be enforced. Attendance will be taken during each class meeting. Please arrive on time. You are responsible for all material covered and all announcements made in class.

- Keep your mobile phone silent during lecture time and pay utmost attention to the lecture.
- Use of electronic devices (such as smartphones and tablets) is strictly forbidden during the lecture.
- Do not hesitate to ask if you have any questions about any of the material discussed during the lecture.

Homework Submission:

- All homework or project documents should be written using MS-Word and/or appropriate computer software. All due assignments must be submitted online. No hand-written submission will be accepted.
- Students may need to demo their work to the instructor during office hours throughout the semester.
- Late submission policy: 10 points deduction for each late day.
- After posting the grades on Blackboard, an office hour will be announced for the students to review their graded works with the instructor. The student has 10 working days maximum to come to the office hour to review his/her graded work.

Academic Honesty:

- Plagiarism (cheating on an exam, sumitting work that is not your own) will not be tolerated. The university rules will be enforced in case of cheating and plagiarism.
- Student submissions must submit their own work without copying from the Internet or from other students. Students could be asked to explain their submission.
- If you have copied someone else's work for the assignment or have allowed someone else to copy your work, both students will get a ZERO mark for the assignment.
- Outsourcing or getting external help to complete assignments is strongly prohibited, and disciplinary actions will be taken if outsourcing is confirmed.

University Code of Conduct

QU expects its students to adopt and abide by the highest standards of conduct in their interaction with professors, peers, staff members and the wider university community. Moreover, QU expects its students to act maturely and responsibly in their relationships with others. Every student is expected to assume the obligations and responsibilities required from them for being members of the QU community.

As such, a student is expected not to engage in behaviors that compromise their integrity, as well as the integrity of QU. Further information regarding the University Code of Conduct may be found on the web at http://www.qu.edu.qa/students/code-of-conduct

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

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 student 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: Abdelkarim Erradi
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