

Michigan State University
ECE456: Computer and Communications Security
Spring 2019 Syllabus

Instructor: Dr. Jian Ren
Office: 2211 Engineering Building
Phone: (517) 353-4379
Email: renjian@msu.edu
Website: <https://d21.msu.edu>
Class Hours: M W F: 3:00PM - 3:50PM
Classroom: 2205 Engineering Building
Office Hours: M W: 11:00am - 12:00pm or by appointment

Required Text

- Network Security - *Private Communications in a Public World*, 2nd Edition, by Charlie Kaufman, Radia Perlman, and Mike Speciner, Prentice Hall, ISBN: 0-13-046019-2, 2002.

Suggested Text

- Cryptography and Network Security - *Principles and Practice*, 3rd Edition, by William Stallings, ISBN: 0-13-091429-0. Prentice-Hall, Inc., 2003
- Introduction to Computer Security, by Matt Bishop, Addison-Wesley-Longman ISBN: 0-321-24744-2
- Cryptography and Data Security, by Dorothy Denning, Addison-Wesley, ISBN: 0-201-10150-5
- Wireless Communications and Networks, by William Stallings, Prentice-Hall, Inc.
- Computer Networks, Fourth Edition, by Andrew S. Tanenbaum, Prentice-Hall, 2003

Course Outline

1. Introduction to cryptography
 - (a) Symmetric ciphers
 - i. Classic ciphers
 - ii. Block ciphers and data encryption standard (DES)
 - iii. Advanced encryption standard (AES)
 - iv. Confidentiality using symmetric encryption
 - (b) Public-key encryption
 - i. Public-key cryptography: RSA and ElGamal
 - ii. Key management
 - iii. Digital signature and non-repudiation
 - iv. Message authentication and hash functions
2. Network security practices
 - (a) Authentication applications
 - (b) Electronic mail security
 - (c) IP security
 - (d) Web security
3. System security
 - (a) Intrusion detection

- (b) Firewalls
- 4. Wireless security
 - (a) Why is wireless communication different from wired communication?
 - (b) CDMA security
 - (c) GSM security
- 5. Selected topics.

Grading Policy

There will be 2 50-minute exams. In the event that you must miss an exam (for any reason), the makeup will be a qualitative oral exam with me.

Grade Breakdown:

Exams:	50% total (2 exams, 25% each)
Homework:	20% total
Final Project:	30%

Homework assignments will be posted on the MSU D2L website regularly, together with their due dates. Posting of new assignments will be announced in class. You must submit your homework before the class on the due date.

Grading Scale:

≥ 90%	= 4.0
≥ 85%	= 3.5
≥ 80%	= 3.0
≥ 75%	= 2.5
≥ 70%	= 2.0
≥ 65%	= 1.5
≥ 60%	= 1.0
< 60%	= 0.0

Attendance Policy

Attendance is required.

Academic Integrity

Student Life, Section 2.3.3: “*The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards.*”

Students who commit an act of academic dishonesty may receive a 0.0 on the assignment or in the course. If I choose to give the student in question a 0.0 on a particular assignment (including exams, projects, quizzes, etc.), that assignment is no longer ‘droppable’, if applicable.

Important Dates:

Classes begin:	1/7/2019
Martin Luther King Day:	1/21/2019 (No Class)
Spring Break	Mon, 3/4-3/8/2019
Exam #1:	Date will be announced two weeks in advance
Exam #2:	Date will be announced two weeks in advance
Final Project Due:	4/23/2019
Last day of class:	4/23/2019

Classroom Policy:

Spartan Life, Section 2.3.5: “*The student’s behavior in the classroom shall be conducive to the teaching and learning process for all concerned.*” This means that I do not appreciate sleeping, reading the paper, ringing cell phones, etc. Please try to develop your professional skills while in this class.