Course Syllabus
Last updated: Aug 20 09:15 PM CT (GMT-6)

Instructor: Dr. Anirudh Paranjothi

Contact Information:
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Zoom: See Office Hours, below
US Post: 230 MSCS; Stillwater, OK 74078-1053

Please use the Q&A discussion forum if your questions are generic. For example, questions regarding homework, assignments, quiz, exams, etc. Either TA or I will respond to your queries within 24 hours, though sometimes it could be as long as 48 hours or more, especially when communication takes place on a weekend or holiday. However, if you need to contact me on an individual basis for example, regarding a medical emergency or any other need, your best choice is by email using the address given above.

Your emails are important to me please make sure to begin the subject line with the course number in square brackets, followed by the message subject; for example: [CS 4243] Error in the following code snippet

***For those of you located anywhere other than my time zone (Central Time, GMT-6), please be aware that this also may affect the time it takes me to respond to your emails***

Office Hours:
Mondays 1:30 – 3:00 PM Central Time, Wednesdays 10:00 – 11:30 AM Central Time, and by appointment for other dates and times.

Office hours are held using Zoom, using the following Zoom meeting information:
https://zoom.us/j/98499287506?pwd=NWVpcVNaTFovOXIzWkMvZjA5ZGRMQT09

Meeting ID: 984 9928 7506
Passcode: 4243

Should something happen that prevents me from being available during office hours on any given date, I will post a notice in the Announcements section of the course Canvas site.
Teaching Assistant

Name: Abinash Borah
Email: aborah@okstate.edu
Office hours:
Tuesdays 5:30 – 6:30 PM Central Time, Thursdays 12:00 – 1:00 PM Central Time, Fridays 9:30 – 10:30 AM Central Time and by appointment for other dates and times.

Office hours Zoom info:
https://okstate-edu.zoom.us/j/91861005232
Meeting ID: 918 6100 5232
(Password not required)

Technical Support:

OSU Arts & Sciences Outreach Office
Email: casoutreach@okstate.edu
Phone: 1-405-744-5647

Textbooks (required)

- Computer Security, Matt Bishop, Addison-Wesley, 2019

Prerequisite:
Prerequisite: CS 3443 or equivalents
Knowledge of Programming

Course Description:
Overview of the components of computer and network security. Discussion of external processes required in secure systems, information assurance, backup, business resumption.
Detailed analysis of security encryption, protocols, hashing, certification, and authentication.

Course Objectives:

This course provides an introduction to computer security. The course will cover a broad range of basic topics in security including cryptography, key management, authentication, design of secure systems, digital signatures, software security, web security and network security. Threats and attacks to computer systems will also be discussed. Protective mechanisms such as defensive programming will be presented.

Course Outcomes:

- To understand the fundamental concepts of security.
- To apply secure design principles to design secure systems
- To implement defensive programming for secure systems
- To understand and recognize threats and attacks on software, networks, and the web
- To provide countermeasures to threats and attacks
- To explain the basic concepts of protecting systems using cryptography

Course Outline:

Topics to be covered. Following is the tentative syllabus for the course. It is intended to change based on availability of time.

A. Overview of Computer Security
B. Protection using Access Control Matrix
C. Introduction to Cryptography. Topics to be covered in outline include Data Encryption Standard and Advanced Encryption Standard, Public key cryptography, Cryptographic checksums such as HMAC and Digital signatures
D. Attacks on Software
   a. Attacks on privileged programs
   b. Attacks through environment variables
   c. Buffer overflow attack
E. Web attacks
   a. Cross-site scripting attack
b. SQL injection attack

F. Operating systems security

G. Internet security

H. Advanced encryption standard and stream ciphers

I. Public key cryptography

J. Introduction to Key Management. Topics will include Key generation and exchange, Cryptographic key infrastructures, storing and revoking keys

K. Authentication mechanisms. This section will briefly describe password selection, Attacking passwords, Biometrics, Location based authentication and Multifactor authentication

Course Canvas Site for the Course

We use Canvas for this course, which you can access at https://canvas.okstate.edu. Sign in using the O-Key username and password provided to you by OSU. Once you sign in, you will see the Canvas Dashboard, which provides you with a list of links for the courses in which you are enrolled. You should see our course listed as CS4243 Combined Paranjothi Fa22. Click on that link to go to the course homepage.

- Announcements – This provides you with important and time-sensitive updates and comments on class matters. Should something happen that prevents me from being available during my office hours on any given date, I will make an effort to post a notice in this section of the course Canvas site. I urge you to turn on notifications to receive Announcements posted through email.

- Discussions – This link takes you to the list of course discussion forums. Here, you will find a Q&A forum where questions/discussion concerning assignments or other aspects of the course can be posted, as well as Topical Discussion Forum, in which specific, topical discussion prompts will be posted by the instructor. Please keep your comments clean and civil.

- Grades – As assignments are graded, scores will be posted here. I will do my best to grade assignments in a timely fashion.
Assignments

The categories of assignments for the course are as follows:

- **Topical discussion assignments** – I will post questions or topics for discussion to the Topical Discussion Forum on the Discussions page of the course Canvas site, along with a due date/time for participation. Each student who makes at least two meaningful and thoughtful posts in response to the instructor or to other students, no later than the due date/time, will receive points for the assignment.

- **Homework/Quizzes** – There will be one homework after every two topics covered in the course outline. Each student works on the homework individually and there will be a quiz based on every homework one week after the homework due date. For example, if the homework is due on 9/19, there will be a quiz on 9/26.

- **Individual Programming Assignments**: There will be individual programming assignments based on internet security/security attacks using an online platform; as the name implies, each student works on these assignments individually.

- **Examinations** – The course includes a final examination. The examination will be taken using an online proctoring service approved by OSU for a small fee that will be charged to your OSU Bursar account.

The point breakdown for the assignments is as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topical Discussion</td>
<td>15%</td>
</tr>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>15%</td>
</tr>
<tr>
<td>Individual Programming Assignments</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
</tbody>
</table>

Total CS4243 Percentage: **100%**
Due Dates & Late work policy

- *Topical discussions and Quizzes* are due 11:59 PM CT (GMT -6) on the date specified on the assignment posted on the course Canvas site.

- *Homework and Individual Programming Assignments* are due by 11:59 PM CT (GMT -6) on the date specified on the assignment posted on the course Canvas site. They may be turned in late, but they lose a percentage of their graded point values according to the following schedule:
  - Submitted by 11:59 PM of the due date .................................................................0%
  - Submitted by 11:59 PM of the second day following the due date .......................15%
  - Submitted by 11:59 PM of the third day following the due date ..........................50%
  - Submitted by 11:59 PM of the fourth day following the due date .........................100%

- Each student will be granted 1 *grace date* for use during the semester to counteract late submissions for *individual programming assignments only*. Each grace date applied to a solution you submit “undoes” one late date for that assignment. For example:
  - Submitted by the second day following the due date
    → one grace date makes it as though it was submitted on time.
  - Submitted by the third day following the due date
    → one grace date makes it as though it was submitted by the second day following the due date

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***The instructor will apply grace dates at the end of the semester in such a way to maximize your total points. Unused grace dates are discarded***

Grading policy:

Grades will be assigned based on point totals as follows:

- 100% to 90%: A
- 90% to 80%: B
- 80% to 70%: C
- 70% to 60%: D
- 60% to 0%: F

Exam Logistics

Final exam will be administered by an online proctoring service approved by OSU. It must be taken within a 48-hour window that extends from Noon CT on the first date specified by the instructor through 11:59AM CT on the second date.
Collaboration policies:

- **Assignments:** Discussion of concepts, ideas, and techniques is acceptable. After discussion, each student must write up his/her own solution. Copying another person’s work, in part or in whole, is not allowed. Giving another student your work, in part or in whole, is considered cheating as well. If you are unsure whether your collaboration is acceptable, speak with the instructor in advance. Take care that your solutions are not exposed to or by other students.

- **Examinations:** During an examination period, no communication of any kind about the exam is allowed, except with the instructor or proctor.

- **Drop and Add Policy:** Students will be allowed to drop as long as the University permits them to do so. A grade of W or F will be determined on the basis of the points earned until that time.

- **Academic Dishonesty/misconduct:** The Computer Science departmental policy for academic dishonesty and misconduct applies to this class. In addition, a student attempting to gain unfair advantage by keeping an examination paper longer than the time permitted is guilty of academic misconduct. Discussion of homework or individual programming assignments is encouraged, but students must work independently.

- **Computer Usage:** The Computer Science departmental policy for computer usage applies to this class. Computer Policy: Computers and other electronic devices such as cell phones may be used ONLY for legitimate classroom purposes, such as taking notes, downloading course materials, or working on an in class activity. E-mail, instant messaging, surfing the Internet, reading the news, or playing games are not considered legitimate classroom purposes; such inappropriate computer use is distracting to those seated around you and is unprofessional.

- **Americans with disabilities act:** The Computer Science departmental policy for students with disabilities applies to this class. Anyone who has a need for examinations by special arrangements should see the instructor at the earliest possible opportunity during scheduled office hours.

- **Ethics:** During the course of the semester, you will learn techniques and tools that can be used to compromise the security of computer systems and computer networks. It is very important that you never use these techniques or tools without the permission of the computer or network owner. You should never attempt to attack the computers or networks belonging to the computer science department, the university, a classmate, or the course staff. If a student unethically exploited a vulnerability, the student would fail the class.
Students who do not comply with the collaboration policies described here will be assigned sanctions in accordance with OSU policy 2-0822 (Academic Integrity). Depending on the circumstances of the violation, the sanctions may result in a score of zero on an assignment, a final grade of F! for the course, or dismissal from OSU. In all instances, the violation will be reported to the appropriate institutional officials.