CIS377 – Introduction to Cybersecurity

CIS377.400 Fall 2023 for 3 credits
Department of Computer and Information Sciences

Meeting Time: Wednesdays 11am – 12:15pm in TM0226
Professor: **Dr. Atul Rawal**
Office: YR206N
E-mail: arawal@towson.edu or atul.rawal@ieee.org
Office Hours: Wednesdays @ 12:30pm – 2:30pm and by appointments via email (Note: Let me know if you require other arrangements.)

The best way to get answers to questions is by sending me an e-mail.

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I. Course Overview

Course Description

This course provides an overview of key cybersecurity concepts and practices and broadly characterizes the global security landscape, including cyber law and cyber warfare. It is structured as a series of ordered modules that cover foundational security principles, risk management, and adversarial thinking as an organizing narrative for a series of modules on data security, system security, network security, personal security, and societal security.

Course Learning Outcomes

- Describe and apply foundational cybersecurity principles.
- Apply risk management techniques to identify cyber assets in an organization, enumerate cyber threats and vulnerabilities, and conceptualize potential mitigations.
- Classify cyber vulnerabilities according to how they affect an organization.
- Recognize data security challenges and apply cryptographic techniques, at a high level, to protect data.
- Describe system level security challenges and list techniques used to prevent and detect such issues.
- Summarize network security concerns and associated mitigation best practices.
- Recognize the social, political, cultural and economic impact of security in cyberspace.
- Discuss current events and debates in cybersecurity.

Course Materials

Required Materials - Easttom, Chuck. Fundamentals Computer Security, 4th Ed. Pearson, 2018. ISBN: 978-0-13-577477-9.

Additional Materials - As assigned on Blackboard

Course Mode

Hybrid - This class is half in-person for 1 hour and 15 minutes and half online. Students are expected to come to class prepared to discuss the material scheduled for that week. The weekly assignments for each student's independent completion of homework will be due on Tuesdays by 11:59pm. **As a result of our hybrid format, the homework assignments should take at least 2 hours to complete, so be sure to put the appropriate effort in to each week's work.**

Course Format: Active learning will include lectures, discussion sessions, presentations and projects. There will be a tabletop class exercise demonstrating real time management of a cyber breach. Other assignments will require critical thinking and analysis from the students. Assignments will require a multitude of instructional practices including but not limited to group-structured learning, individual research, presentations, debates, and interactive discussions.

II. Course Requirements, Grading, and Evaluation

Grades: The final grade will be a weighted average of the following components.

Graded Components	Contribution to Overall Grade
Quizzes	15 %
Homework & Assignments	20 %
Final Project	25 %
Midterm	20 %
Final Exam	20 %
Total	**100%**

Grading Scale	
A	93-100
A-	90-92.99
B+	87-89.99
B	83-86.99
B-	80-82.99
C+	75-79.99
C	70-74.99
D+	67-69.99
D	63-66.99
D-	60-62.99
F	Below 60

Computer and Information Sciences Program Objectives:

CS Program Objectives:

- Students can use their proficiency in theoretical and applied computing principles & practices to solve a variety of problems.
- Students can explain the theoretical and applied principles that underlie computer science.
- Students will understand the ethical and societal concerns and dilemmas facing computer scientists and can formulate appropriate solutions and courses of action.
- Students can work effectively in teams and communicate effectively.

IS Program Objectives:

- Students can use their proficiency in information systems principles & practices and quantitative analysis to solve a variety of problems.
- Students can explain the quantitative and business principles that underlie information systems.
- Students will understand the ethical and societal concerns and dilemmas facing information systems professionals and can formulate appropriate solutions and courses of action.
- Students can work effectively in teams and communicate effectively.

IT Program Objectives:

- Understand and apply appropriate information technologies and employ appropriate methods, processes and tools to address real-world problems.
- Select, deploy and maintain information technology resources to help an organization achieve its goals and objectives.
- Anticipate the changing direction of information technology and evaluate and recommend the use of appropriate new technologies.
- Understand the ethical and societal issues facing information technology professionals and be able to formulate appropriate solutions.
- Work effectively in teams and communicate effectively.

III. Course and University Policies

Attendance and Absence Policy

Attendance/absence policy as it relates to grades in this course, consistent with TU Class Attendance/Absence Policy. This class will meet once a week for 1 hour and 15 minutes each & the virtual assignments will be given for the class at the beginning of the week. Due to the assignments, labs and teamwork, attendance is vital. In the event of an emergency, please notify the instructor in advance. **Multiple absences may result in course failure.**

Should a student's absence occur during a regularly scheduled exam or project presentation, the student will automatically receive a grade of 0 for the exam or presentation unless one of these two things occur: 1.) The student notifies the instructor of the absence prior to the exam or presentation and supplies a written doctor's excuse explaining the absence or 2.) The instructor reserves the right to excuse certain extraordinary situations. Upon the occurrence of the two above exceptions, the student will be able to schedule a make-up exam.

Mask Policy

Although masks at TU are currently optional, know that we are still in a pandemic and this is a volatile situation that may require face coverings. Should masks be required: "While on the Towson University campus, clear expectations have been shared with the University community about the wearing of masks. **According to the TU Communications, if Face coverings over the nose and mouth are required while you are indoors at all times**. There are no exceptions. Students not wearing a mask will be given a warning and asked to wear one or will be asked to leave the classroom immediately. Students who have additional incidents with the mask expectation after a first warning will be referred to the Office of Student Conduct and Civility Education for failure to comply with a directive of university officials. (Office of Provost and Academic Senate Chair)"

Campus COVID Reporting Tool

Due to an ongoing pandemic, TU requires reports of COVID-19 exposure or testing positive be reported through https://www.towson.edu/coronavirus/report-covid.html .

Late Work Policy - No late homework will be accepted. A missed quiz or exam results in a grade of 0.

Add/Drop & Withdraw Deadlines

08/31/2023 – Last day to drop a course with no grade posted &
11/06/2023 – Last day to drop a course with a grade of "W"

Academic Integrity Policy

All students are required to honor Towson University's Academic Integrity Policy which includes Plagiarism, Fabrication and Falsification, Cheating, Complicity in Academic Dishonesty, Abuse of Academic Materials, & Multiple Submissions. Failure to do so will result in an official notification to the Office of Student Conduct & Civility Education and will result in at least a zero on the assignment with the possibility of course failure depending on the severity. Discussions among students fosters learning however, work must be individually prepared unless otherwise specified. All assignments must be turned in electronic format, so that papers can be assessed for academic integrity.

Course Repeat Policy

University policy requires that we inform you that students may NOT repeat a course more than once without prior permission from the Academic Standards Committee. Third attempts are NOT allowed in the Computer & Information Sciences Department!

Students with Disabilities Policy

If you are a student with a disability, please contact me to discuss your specific needs. A memo from Accessibility & Disability Services (ADS) authorizing your accommodations will be needed. Please note that accommodations needed for an online course may be different than those needed in a traditional classroom setting, so it is important that you work with ADS to determine appropriate accommodations for this course as early as possible. For more information, or if you have questions about accommodations, contact Disability Support Services at 410-704-2638 or visit https://www.towson.edu/accessibility-disability-services/.

Instructor Responses - Feedback will be provided on written assignments within 1 week and email responses 24 - 48 hours on weekdays.

General Guidelines

Major Course Activities

- Student learning will be enabled by textbook reading, lectures, individual and group assignments, and hands-on labs. For each chapter, there will be assignments including practical exercises and possible quizzes. These assignments are due each week.
- Learning will be self-directed and participative. Evaluation of learning will be based on the quantity and quality of student (self-directed) study reflected by completing all assignments, and examinations.
- Students are expected to complete the assigned readings and learning exercises during the week the assignment is due.
- The following list depicts major course activities:

1. ***Reading*** - You will be responsible for reading the assigned Chapters and any other relevant materials prior to the in-class lecture.

2. ***Group Projects***
   - The group project will involve working as a group, prepare a research paper and a class presentation which discusses a topic of your choice related to cybersecurity and/or other security related issues including well known cyber-attacks on organizations such as the recent attacks on HBCUs. The group projects will require a substantial amount of **research work** towards the review, implementation, and/or demo of issues related to computer security. A proper understanding of the material will be tested upon by questions related to the presentations by myself and your peers.
   - The group is required to **review several newly published conference and/or journal papers.**
   - This research project is intended to help you develop your research skills and ability to read and understand highly technical research papers. While you may supplement your reading list with other sources of information, you must focus on the research literature to receive credit for this assignment.

3. ***Exams***

- The Midterm and Final will be comprehensive exams that include questions based on the book content, lecture material, lab work, and any other course activities performed during the entire semester.
- There will be **no make-up** for the exams except for extraordinary circumstances. (Please let me know if there are any issues with you taking the exam and we will work on an alternative)

4. ***Quizzes*** – Weekly quizzes will be due on Thursdays @ 12:00 PM each week. There will be 10 total quizzes for the semester, with the lowest two grades excluded from the final grades.

5. ***Homework*** – Homework assignments will be due on Wednesdays at 12:00 AM each week.

Online Etiquette Expectations

As you may have already experienced, communications in text or writing are easily misinterpreted, and to avoid such difficulties, our class will abide by the following guidelines for all communications:

- Use standard professional language.
- Be sensitive to cultural differences.
- Avoid slang and never use profanity.
- Feel free to disagree, but never disrespect
- Avoid text message acronyms (e.g., LOL).
- Use appropriate grammar and spelling.

Written Reports

All written assignments necessitate proper grammar, spelling, punctuation, and revisions for flow. Complete, concise and clear thoughts are expected in full sentences. Writing material must be typed using double-spaced, Times New Roman, 12-point font, default margin settings of 1" on the sides and 1" on the top and bottom. All submitted materials require professional presentation, which includes binders or folders and proper formatting using either the IEEE or ACM style https://ieeeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf or https://www.acm.org/publications/authors/reference-formatting. **All papers, including group projects, MUST BE APPROPRIATELY CITED; FAILURE to do so is PLAGIARISM and will RESULT in at least an 'F' on the assignment and possible COURSE FAILURE. The URL is REQUIRED for all web sources in the Works Cited.**

IV. Technology Use & Requirements

Blackboard

- Blackboard is Towson's Learning Management System.
- Complete the browser check to ensure your computer will be compatible with all Blackboard tools.
- The Blackboard App gives students and instructors access to their courses, content and organizations. Available in your phone's market place.
- View Blackboard help resources for students (e.g., tutorials).
- All assignments, class handouts, reviews, discussion forums and general course information will be managed through this site.

Technical Support

TechHub - "The TechHub provides technical information and resources to students…" including tutoring and lab information.
https://www.towson.edu/fcsm/departments/computerinfosci/resources/labs.html

Student Computing Services - (SCS at http://www.towson.edu/scs) is your campus resource for technology questions including Blackboard. You can email SCS, call them at 410-704-5151, chat in the lower right corner of any SCS webpage, text at 410-324-7271, or submit a service request. You may also visit the Student Computing Services labs in Cook 35 and Towson Run 123.

If you attempt to access Blackboard and it is unavailable beyond a scheduled maintenance, please view the OTS Alerts to find out further information about the system outage.

V. Student Support Services & Resources

CIS (Department) Advising Hub

Students are encouraged to meet with Student Advisors at the CIS Advising Hub located in YR207 on the second floor of the 7800 York Road building.
https://www.towson.edu/fcsm/departments/computerinfosci/resources/advising.html
Run by computing majors in our department, Student Advisors can help with course selection, **degree planning**, change of majors, transfer petitions, and general advising. Student led meetings and workshops are also held throughout the semester to help students build degree plans and learn more about our majors.

Tutoring & Learning Center

The Tutoring & Learning Center assists students in identifying and achieving academic goals. Services include tutoring, peer-assisted learning sessions, academic coaching, study groups, and study skills workshops.

Academic Advising

The mission of the Undergraduate Academic Advising Center (UAAC) is to ensure that informed, effective, and easily accessible academic advising, which addresses individual needs and interests, is available to every undergraduate student at Towson University.

Research Help

Cook library offers a range of services related to research, including book/article finding and/or borrowing, copyright issues, e-reserve, writing style consultation, searching strategies, etc.

Writing Services

Towson offers a range of writing support services for undergraduate students, graduate students and international students, including the Writing Center, Online Writing Support, and English Language Center.

Public Communication Center

"The Public Communication Center is dedicated to helping all members of the Towson University community become more effective, engaged, and empowered speakers." https://www.towson.edu/cofac/centers/public-communication.html

VI. Tentative Schedule for CIS377.400 Fall 2023

Week	Date	Class Topics	Activities and Assignments	HW Due Date
1	8/30/23	• Syllabus & Introductions • Cybersecurity Foundations- Introduction to Cybersecurity CIA and Principles	• Introduction to Cyber (Read Ch 1 & WSJ article) • HW 1 – Code of Ethics • Quiz 1 (Due 09/01)	9/05
	8/31/23	Last day to add/drop a course with no grade posted to academic record.		
2	9/6/23	• Cyber War • Cyber War Videos – See HW2	• Cyber War (Read Ch 12) • HW 2 – Cyber War • Quiz 2 (Due 09/07)	9/12
3	9/13/23	• Network & Network Security	• Networks (Read Ch 2, 11) • HW 3 – Wireshark • Quiz 3 (Due 09/14)	9/26
4	9/20/23	**No Class**		
5	9/27/23	• Network Security (Cont'd) • Cyber Attacks and Defense	• Cyber Attacks and Defense (Read Ch 4,5,6) • HW 4 – Network Security • Quiz 4 (Due 09/28)	10/3
6	10/4/23	• Cyber Attacks and Defense (cont'd)	• Cyber Attacks and Defense (Read Ch 4,5,6) • HW 5 – Cyber Attacks & Defense • Quiz 5 (Due 10/05)	10/11
7	10/11/23	• Identity, Authentication, and Access Control, Physical Security	• Access Control (Read Ch 10) Physical Security • HW 6 – Access Control • Quiz 6 (Due 10/12)	10/17
8	10/18/23	**Midterm Exam**		
9	10/25/23	• Risk Management	• HW 7 – Risk Management Project • Quiz 7(Due 10/26)	10/31
10	11/6/23	Last day to "W"ithdraw		
	11/1/23	• Incident response (disaster recovery)	• Incident Response & Forensics (Read 5) • HW 8 – Incident response • Quiz 8 (Due 11/2)	11/7
11	11/8/23	• Secure Software • Cryptography	• Secure Software (Read Ch 9) • HW 9 – Secure Software • Quiz 9 (Due 11/9)	11/14

12	11/15/23	• Cryptography • Legal, Ethics, Privacy, and Social Engineering	• HW 10 - Cryptography • Quiz 10 (Due 11/16)	11/28
13	11/22/23	**No Class – Thanksgiving Break**		
14	11/29/23	Presentations		
15	12/6/23	Presentations		
Section 400 Final Exam TBA				