CYBR 400: Computer Security Design, Fall 2020
Department of Computer Sciences and Electrical Engineering
Marshall University

Course Information:

- Instructor: Dr. Cong Pu (Ph.D., Assistant Professor)
- Office: Important: All office hours should be held virtually during the COVID-19 pandemic unless face-to-face hours are approved by the department chair.
- Phone: (304) 696-6204
- Email: puc@marshall.edu
- Website: https://sites.google.com/site/congputh
- Class format: **Virtual Class** – Online Synchronous Activities Required. Refer To: WWW.MARSHALL.EDU/VIRTUAL
- **Virtual class meetings**: Mon, 4:00 p.m. – 6:20 p.m., **Microsoft Teams**
    - Class meetings are held live via Microsoft Teams, with instructors broadcasting lectures and leading classroom discussions at the specified class meeting day and time. (Sessions are recorded so students who do not have reliable access to broadband and/or other technical difficulties can watch the class at another time.)
    - To get familiar with Microsoft Teams, see https://www.marshall.edu/it/teams/
    - To join a virtual class meeting in Microsoft Teams, watch https://www.youtube.com/watch?v=BH6bSIwR0-4
- Technology assistance
    - If you have technical problems, please contact one or more of the following:
        - Blackboard Support (URL: www.marshall.edu/design-center/support-ticket/)
        - Marshall Information Technology (IT) Service Desk (Help Desk) (URL: http://www.marshall.edu/it/departments/it-service-desk/)
            - Huntington: (304) 696-3200
            - South Charleston: (304) 746-1969
            - Email the IT Service Desk (itservicedesk@marshall.edu)
- **Virtual office hours**:
    - By appointment for video meeting; Important: All office hours should be held virtually during the COVID-19 pandemic unless face-to-face hours are approved by the department chair.
    - Students are expected to communicate with instructor to set up **video meetings** via **Microsoft Teams**
- Course web page: **MU Online (Blackboard)** http://www.marshall.edu/muonline/. It is important to visit **MU Online (Blackboard)** regularly for up-to-date course information.

Additional COVID-19 Related Information:

- All students must wear face coverings during class and in all academic buildings, hallways, stairwells, lobbies. All Marshall students will receive two branded reusable cloth masks upon return to campus. Students who arrive in class without a face covering will be asked to leave the classroom.
- All students must abide by engineered social distancing protocols (one-way entrances/exits, one-way stairwells, etc.).

- All students will pick up a sanitizing wipe (which will be provided) and sanitize their workstations upon entering the classroom.
- All faculty office hours will be held virtually by appointment unless face-to-face hours are approved by the department chair.
- For the safety of all class members, please DO NOT share course materials.
- Please wash your hands with soap and water and/or use hand sanitizer regularly.
- Seating will be configured to maintain appropriate social distancing.
    - [Assigned seating can be helpful in maintaining social distancing and conducting contact tracing if necessary. Faculty are strongly encouraged to use assigned seating for Fall 2020. If you choose to use assigned seating, add a clause regarding assigned seating here].

Course Description: From Catalog

- The course covers technical and analytical skills to implement comprehensive computer security that encompass designing secure systems, information security, protecting information assets, managing computer security, risk mitigation strategies, incident response. (Prerequisites: None)

Course Student Learning Outcomes: The table below shows the following relationships: How each student learning outcomes will be practiced and accessed in the course.

Course Student Learning Outcomes	**How students will practice each outcome in this course**	**How student achievement of each outcome will be assessed in this course**
Students will be able to explore the threat landscape and ways to mitigate risks.	• Lecture • Examples • In-class exercise	• Assignment • Quiz • Exam
Students will be able to respond to an incident using the six-step process of incident response: Preparation, Identification, Containment, Eradication, Recovery, and Lessons Learned.	• Lecture • Examples • In-class exercise	• Assignment • Quiz • Exam
Students will be familiar with approaches to analyzing malware, ranging from fully automated analysis to static properties analysis, behavioral analysis, and code analysis.	• Lecture • Examples • In-class exercise	• Assignment • Quiz • Exam

Preferred Communication Method and Expected Response Time:

- You are expected to communicate with me to set up video meetings via Microsoft Teams. 6 hours advance notice is required when scheduling an appointment. If you ask me to meet you on Microsoft Teams in one or two hours, my answer will probably be "No".
- You can send a message to me in class channel on Microsoft Teams. However, you may expect my delayed response because it depends on when I check or use Microsoft Teams.

    - To send a message in channel on Microsoft Teams, watch https://www.youtube.com/watch?v=7DSbBr7Xwfs
- You can generally expect an email response within 6 hours. If you do not get a response within 6 hours, please forward your previous email to me to remind me.
- You can generally expect the feedback on assignment, review quiz, and exam in one week after submission. If you do not receive the feedback in two weeks, please send an email to me.
- You are also encouraged to actively communicate with fellow students to discuss any class related topics (quiz, assignment, or exam) in class channel on Microsoft Teams.
    - Be a good classmate
        - Remember your own role as a student. Follow your instructor's directions at all times. Be authentic and collaborative with fellow students. Be aware of cyberbullying and make every attempt to eliminate it. Appreciate the diversity and different communication styles of your peers.
    - Be professional
        - Proofread your own writing for spelling, grammar, and punctuation to prevent miscommunication. Avoid slang, sarcasm, or emotionally-charged writing, as tone can be difficult to translate online. Profanity and offensive language will not be tolerated. Do not use abbreviations (2moro, 2T, B@U) or emoticons in class channel.

Required Textbooks, Additional Reading, and Other Materials:

- A list of reference books will be used. For more information, please refer to the following resources:
    - William Stallings and Lawrie Brown. Computer Security: Principles and Practice. Pearson. 4th Edition. ISBN-10: 1292220619. ISBN-13: 978-1292220611.
    - Matt Bishop. Computer Security. Addison-Wesley Professional. 2nd Edition. ISBN-10: 0321712331. ISBN-13: 978-0321712332.
- Important concepts/materials will be included in the lecture notes from various sources and posted on **MU Online (Blackboard)**.

Course Requirements and Grading Policy:

- **1st Exam: 15%, Sep 28 (Monday), 4:00 p.m. – 6:20 p.m., MU Online (Blackboard)**
- **2nd Exam: 15%, Oct 26 (Monday), 4:00 p.m. – 6:20 p.m., MU Online (Blackboard)**
- **3rd Exam: 15%, Dec 07 (Monday), 4:00 p.m. – 6:00 p.m., MU Online (Blackboard)**
    - All three exams are **computer-based exams**. You can take exam wherever you want during exam time and **SUBMIT on Blackboard.**
    - Open book and open notes; Internet resources are allowed.
    - There will be **NO** make-up for missing exam. Only university excused absences with appropriate and official **DOCUMENTATION** will be accepted for make-up exam. The make-up exam must be taken within two days after the scheduled exam.
    - If you want to take a conflict exam, you must talk to instructor and provide a valid document at least two weeks before the scheduled exam. The conflict exam must be taken within two days after the scheduled exam.
- **Review Quiz: 10%**

- All review quizzes are **computer-based quizzes**. You will take review quiz before or after class meeting and **SUBMIT on Blackboard.**

- **Assignment: 45%**
  - Students are supposed to read the provided research paper, write a two-page report, and present the research paper.
    - Report and presentation should be prepared based on the provided criteria.
    - Presentation schedule and assigned research paper will be available on Blackboard.
  - Assignment (two-page report and presentation slides) should be **SUBMITTED on Blackboard before Due Date**. *Other submission methods will NOT be accepted.*
  - **LATE Submission will NOT Be Accepted on Blackboard** since the submission link will be closed automatically after due date.
- Plagiarism:
  - Plagiarism or cheating will not be tolerated in the class.
    - 1st plagiarism will result in zero point in the suspected work.
    - 2nd plagiarism will result in immediate dismissal (F grade).
- All grades will be posted on Blackboard:
  - *You are highly suggested to check your grade on Blackboard frequently and notify instructor immediately if there is any grading error*.
  - Mid-term grade will be posted before October 5 (Monday)
    - October 23 (Friday), last day to drop an individual course.
    - Fall 2020 calendar: https://www.marshall.edu/academic-calendar/fall-2020-semester/
- Grade Scale:
  - Actual points received in each category should be converted into category percentage.
  - For example, if you got 40/50 for 5 assignments, the percentage of assignment category will be (40 / 50) * 45 = 36 (%).
  - A (100 - 90), B (89 - 80), C (79 - 70), D (69 - 60), and F (59 - 0)
- Bonus Points & Extra Credits:
  - Throughout the semester, the instructor will create certain **voluntary** work for **all** students to get bonus points. However, the instructor will only reward the students who complete the **voluntary** work.
- Excuses
  - Because there is a degree of flexibility in completing items, it is your responsibility to keep track of dates and give yourself enough time for completion. If you wait until the last minute, there is no one to blame but yourself. With that said, I am also not heartless. If there is something that occurs which prevents your access to the course for a significant length of time (e.g., serious illness, death in the family, or personal tragedy) please contact me as soon as possible and we may be able to work something out. In this case, I will need verification, and it will be left to my discretion on its acceptability.

Attendance and Virtual Classroom Policy:

- Students are expected to attend punctually all virtual class meetings, from the beginning of the semester until the end of the semester.

- If a student needs self-quarantine for 14 days due to COVID-19, make-up will be provided for exam or assignment that is due during self-quarantine period when the self-quarantine is over.
- If a student misses a virtual class without university excused absence, the student should not expect individualized instruction what was missed. This will be effective from the beginning of semester.
- Students are expected to assist in maintaining a virtual classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave virtual class.
- Students will be muted and they will need to raise a hand to ask questions during class meeting.
    - To raise your hand in a Microsoft Teams meeting, watch https://www.youtube.com/watch?v=7oVnuJA1ACE
- The instructor will first ask students to elaborate on their questions, and then provide responses.

Marshall University Policy: By enrolling in this course, you agree to the University Policies. Please read the full text of each policy (listed below) by going to Academic Affairs: Marshall University Policies. (URL: http://www.marshall.edu/academic-affairs/policies/)

- Academic Dishonesty Policy
- Academic Dismissal Policy
- Academic Forgiveness Policy
- Academic Probation and Suspension Policy
- Affirmative Action Policy
- Dead Week Policy
- D/F Repeat Rule
- Excused Absence Policy for Undergraduates
- Inclement Weather Policy
- Sexual Harassment Policy
- Students with Disabilities (Policies and Procedures)
- University Computing Services Acceptable Use Policy

Course Schedule and Important Dates: Topics and/or dates may be changed during the semester at the instructor's discretion because of scheduling issues, developments in the discipline, or other contingencies.

- Aug 24: Computer Security Overview
- Aug 31: Cryptography
    - Release Assignment_1 (Topic: User Cryptography)
- **Sep 07: Labor Day Holiday – University Closed**
- Sep 14: Cryptography
- Sep 21: User Authentication
    - Assignment_1 Due

        - Report (Topic: User Cryptography)
        - Research Paper (Topic: Cryptography) Presentation
    - Release Assignment_2 (Topic: User Authentication)
- **Sep 28: 1st Exam. Monday, 4:00 p.m. – 6:20 p.m.**
- Oct 05: Access Control
    - Assignment_2 Due
        - Report (Topic: User Authentication)
        - Research Paper (Topic: User Authentication) Presentation
    - Release Assignment_3 (Topic: Access Control)
- Oct 12: Database Security
    - Assignment_3 Due
        - Report (Topic: Access Control)
        - Research Paper (Topic: Access Control) Presentation
    - Release Assignment_4 (Topic: Database Security)
- Oct 19: Malicious Software
    - Assignment_4 Due
        - Report (Topic: Database Security)
        - Research Paper (Topic: Database Security) Presentation
    - Release Assignment_5 (Topic: Malicious Software)
- **Oct 26: 2nd Exam. Monday, 4:00 p.m. – 6:20 p.m.**
- Nov 02: Denial-of-Service Attacks
    - Assignment_5 Due
        - Report (Topic: Malicious Software)
        - Research Paper (Topic: Malicious Software) Presentation
    - Release Assignment_6 (Topic: Denial-of-Service Attacks)
- Nov 09: Intrusion Detection
    - Assignment_6 Due
        - Report (Topic: Denial-of-Service Attacks)
        - Research Paper (Topic: Denial-of-Service Attacks) Presentation
    - Release Assignment_7 (Topic: Intrusion Detection)
- Nov 16: Firewalls and Intrusion Prevention Systems
    - Assignment_7 Due
        - Report (Topic: Intrusion Detection)
        - Research Paper (Topic: Intrusion Detection) Presentation
- Nov 23: **Thanksgiving Break – Classes Dismissed**
- Nov 30: “Dead Week”
- **Dec 07: 3rd Exam, Monday, 4:00 p.m. – 6:00 p.m.**