Secure Design

CNS 397/597 – Tuesday - 5:45 – 9:00pm / CDM 228

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Course Description

Secure Design is a course that extends human-centered security, while better integrating cybersecurity and design. The course includes hands-on, interactive activities focused on secure designs for Internet-of-Things (IoT). Secure Design is a learner-centered course where students have a considerable control over the learning process; It is expected that students can independently evaluate security solutions, analyze design arguments, and develop secure designs. **There are no pre-requisites**.

Course Schedule

W	Topic	Assignment
1	Users: the weakest link?	[Homework] - *Security Fatigue*
2	Visual Design	[Homework] - *A Survey and Analysis of Current CAPTCHA Approaches*
3	User Experience Design	[Report] - Heuristics Evaluation: Cisco Small Business VoIP Router
4	Human-centered Security	[Homework] - *Mental Models: General Introduction and Review of their Application to Human-Centered Security*
5	Cybersecurity and IoT	[Homework] - *On Security Challenges and Open Issues in Internet of Things*
6	Experimenting with A Smart IoT Home	[Report] - Smart IoT Home setup
7	Outsmarting the Smart Home	[Report] - Outsmarting the Smart IoT Home
8	Prototyping	[Prototype] - Prototype
9	Prototypes - Usability Testing	[Report] - Usability tests; [Presentation] – Prototype presentation
10	Final Presentations	[Peer Review] - Peer review

Materials

No textbook required. Tools, IoT devices, and readings are provided on D2L/in class.

Assignments

Homeworks: Described in a separate document in D2L for each week in the course.

Laboratory Exercises: We will use IoT equipment for demonstrational purposes in class. You will work in groups. Online students don't have to purchase any equipment, the demos will be recorded. If you want to experiments on your own, email me.

Prototype: After the demonstration labs, you will we work in groups on a secure design prototype. I will assign the groups. They will include both in-class and online students. You have to collaborate in the group. The objective is to design a porotype of the IoT equipment used in the labs to help users make secure decisions. If you want to pick your own IoT equipment you want to work on secure design, email me.

Usability script: Each group has to write a usability script that coverers the major parts of your secure design prototype. The script must include step-by-step instructions for usability testing of your prototype. The testing results from will be used later on to aid the peer critiques. There is no specifically correct or incorrect solution.

Presentation: Each group must deliver a presentation that reflects a coherent application of design and cybersecurity principles for your prototype.

Peer Review: Based on the secure design concepts, usability principles, and heuristics, each student has to report on the usability and security of your peers' solutions. Each student have to choose only one prototype to complete this assignment.

Assignments Delivery: Assignments are due one week after each is assigned at 11:59 PM. No late submission will be accepted.

Grading

Grading is based on a percentage basis, which converts to a letter as:

Percentage	Grade	Percentage	Grade	Percentage	Grade
		100-92	A	91-90	A-
89-98	B+	87-82	B	81-80	B-
79-78	C+	77-72	C	71-70	C-
69-68	D+	67-62	D	61-60	D-
59-0	F				

The weights of each assignment for contributing to the final average are as follows:

Assignment	Points
Homeworks	20%
Reports	20%
Prototype	40%
Presentation	10%
Peer Review	10%
Total:	**100%**

Learning Outcomes

Upon completion of the course, students will be able to:

- Interpret and apply the basic cybersecurity and user-centered design principles
- Analyze security flaws in the structure, user interaction, and visual design that make IoT-related exploits possible
- Design a secure IoT prototype that eliminates both security and design flaws and develop a usability tests to validate the secure design

Important Information

Attendance: I expect that you will attend every class; You are responsible for material covered, assignments delivered/received, and announcements made in class/ on D2L.

Class Cancellation: Unless DePaul University officially closes, we will have class.

Incompletes: Must formally be requested through myCDM.

Academic Integrity: You must read, understand, and comply with the DePaul's policy on academic integrity: http://academicintegrity.depaul.edu/. It is part of this syllabus.

Changes to Syllabus: I reserve the right to make changes to the syllabus.

Academic Policies: All students are required to manage their class schedules each term in accordance with the deadlines indicated in the University Academic Calendar: http://www.cdm.depaul.edu/Current%20Students/Pages/PoliciesandProcedures.aspx

Students with Disabilities: Students who feel they may need an accommodation based on the impact of a disability should contact the Center for Students with Disabilities (CSD) at: csd@depaul.edu. Lewis Center 1420, 25 East Jackson Blvd. Phone number: (312)362-8002