Villanova University
Master of Science in Cybersecurity
Department of Electrical and Computer Engineering

ECE 8492 Secure Software Development

Spring 2021: **ECE 8492 - DL1 Secure Software Development CRN 32227**
Day: Monday from 6:10 pm to 8:50 pm via Zoom
Location: Distant Learning via Zoom
Office Hours: by email appointment via Zoom

Prerequisite Course: ECE 8484 - Cybersecurity Threats and Defense

Prerequisites:	ECE 8484

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linkedin VU ECE group manager - "Villanova Electrical and Computer Engineering"
- 500+ members, please join this linkedin group

General Course Information:

This is a graduate level class focused on making software systems secure starting in the functional, design and requirements stage. You will acquire the knowledge to function as a Security Advisor (SA) on major software development teams. As an SA you will learn to bring the separate mindsets of Software Developers and Security Experts to into one team with shared goals and collaborative development and testing.

Due dates for assignments for this class are designed to spread the workload over the semester. Assignments will be submitted via the Blackboard web site. Reading assignments will be paced to the course schedule and should be done on the class schedule so the workload does not become overwhelming prior to the end of the course.

Topics to be covered include:

- Developing shared goals and requirements for collaboration between software developers and security experts
- Informing software developers to design, write, deploy, and operate more secure software
- Organizing a software security team before you've even created requirements
- Implementing positive secure software design practices and identifying security defects in existing designs
- Software developers and security experts teaming to include security design in code reviews, clarify attack scenarios associated with vulnerable code, and validate positive compliance
- Integrating your new application with your existing security infrastructure
- Protecting application security during updates and maintenance
- Moving beyond pentesting (penetration testing) toward more comprehensive security testing
- Real world program examples
- Security requirements in application fields: Medical, Military, Financial, and Homeland Infrastructure
- High interest secure applications: Cloud, Blockchain, BITCOIN, MLS, and Key management

Readings

There is a required textbook for this course:

- Van Wyk, K. R., Graff, M. G., Peters, D. S., & Burley, D. L. (2014) Enterprise Software Security: A confluence of disciplines ISBN-13: 978-0321604118

This is an excellent text that matches this course and is available in new, used and ebook format from Amazon, Ebay, Google Play, and others

Distant Learning via Zoom

Go to Blackboard > Spr21_ECE_8492_DL1

Go to left pane > VU Zoom

Mon, Jan 25 (Recurring) 6:10 PM
Secure Software Development - ECE 8492 – Lecture > Start

Office Hours via Zoom

Go to Blackboard > Spr21_ECE_8492_DL1

Go to left pane > VU Zoom

Recurring
Secure Software Development - ECE 8492 - Office Hours > Start

Spring 2021 ECE 8492 Class Schedule

25 Jan 6:10 to 8:50 pm – Class 1
01 Feb 6:10 to 8:50 pm – Class 2
08 Feb 6:10 to 8:50 pm – Class 3
15 Feb 6:10 to 8:50 pm – Class 4
22 Feb 6:10 to 8:50 pm – Class 5
01 Mar 6:10 to 8:50 pm – Class 6
08 Mar 6:10 to 8:50 pm – Class 7
15 Mar 6:10 to 8:50 pm – Class 8
22 Mar 6:10 to 8:50 pm – Class 9
29 Mar 6:10 to 8:50 pm – Class 10
05 Apr 6:10 to 8:50 pm – Class 11
12 Apr 6:10 to 8:50 pm – Class 12
19 Apr 6:10 to 8:50 pm – Class 13
26 Apr 6:10 to 8:50 pm – Class 14
03 - 11 May – Final PPT and Paper

Power Point Assignments and Presentations

You are required to complete **six** written Power Point (PPT) assignments. The PPT assignments are on the topics associated with the course modules. On a schedule you will be given 10 minutes to present your latest PPT to the class. How often you will present will depend on the class enrollment numbers.

Final Paper

The student will write an APA formatted software security project paper to include the prominent security issues in SDLC. Additionally, the paper must address the cybersecurity issues in software deployed in national critical infrastructure systems. The paper should be 10 to 15 pages in length (2,500 to 5,000 words).

Submissions are done via Blackboard by class time on due date. Late penalties can apply: up to 20% reduction per 24-hour period.

GRADING AND EVALUATION

Your grade in the course will be determined as follows:

- Power Point assignments (6) — 60%
- Final paper assignment — 40%

Final project process:

- Topic approval—C(complete)/I(incomplete)—The topic must be approved for the project to continue and for a final paper grade to be issued.
- Literature survey—C(complete)/I(incomplete)—The submitted references list (APA) will be considered as part of the final paper grade.
- Paper outline—C(complete)/I(incomplete)—The outline will receive mentor feedback that may be used to improve the final paper.
- Draft paper—C(complete)/I(incomplete)—The draft paper will receive mentor feedback that may be used to improve the final paper.
- Final paper— submitted to Blackboard before COB 11 May 2021

All activities will receive a numerical grade of 0–100. You will receive a score of 0 for any work not submitted. Your final grade in the course will be a letter grade. Letter grade equivalents for numerical grades are as follows:

A standard grade scale will be used: A: 95-100; A-: 90-94; B+: 87-89; B: 83-86; B-: 80-82; C+: 77-79; C: 73-76; C-: 70-72; F: < 70

Lectures and Attendance

You should try to view every class: virtually (distance learning). Class slides may have most of the material covered, but not all. Students may contribute insightful information

or questions via Zoom during class that you can learn from. You are responsible for everything covered in class, the course text or on Blackboard.

Academic Honesty

You are allowed to discuss high level issues with your fellow students, look up more on topics on the Internet, and so on. However, submitted work must be your own solution, your own words, nothing copied without attribution.

Don't be evil

The knowledge you gain in class is for educational purposes only. You may gain powers in this class that you are duty bound not to misuse. You will promise not to scope out, attack, subvert or disrupt Villanova ECE, Villanova, corporate, county, US state or federal computer systems. US State and Federal law does not take these things lightly - prison and $10,000s of fines. Foreign students will probably lose their visa and be deported. Be careful with what you do.

Academic Integrity

The College of Engineering is committed to creating an environment of academic integrity and ethical decision-making that we hope is reflected in the actions of our students and graduates. As Villanova students, integrity is central to the University mission. As engineers, our code of conduct requires us to place honor and integrity at the forefront of everything we do. As engineering students, it is expected that you will begin to adopt these values and instill them into your work habits. Students violating the academic integrity policy will receive a zero on that assignment or exam and the violation will be reported to the Associate Dean for Academic Affairs.

The University's academic integrity policy can be found here:
https://www1.villanova.edu/villanova/provost/resources/student/policies/integrity.html

Learning Support

It is the policy of Villanova to make reasonable academic accommodations for qualified individuals with disabilities. If you are a person with a disability, please contact me after class or during office hours to make arrangements.

If you have a non-physical disability you need to register with the Learning Support Office by contacting 610-519-5176 or at http://learning.support.services@villanova.edu as soon as possible. Registration is needed to receive accommodations.

The Office of Disability Services collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The ODS provides Villanova University students with physical disabilities the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact and register with Gregory Hannah, advisor to students with disabilities 610-519-3209 or visit the office on the second floor of the Connelly Center.