ENPM665: Cloud Security - Fall 2022 Sections 0201 & CY01 Syllabus

Version 1.1 – August 24th 2022

Day & Time: Wednesday 4pm – 6:40pm
Location: JMP 2116 & Online

Instructor: Kevin Shivers – kts@umd.edu
TA: Derek Zhang - dzhang21@umd.edu

When contacting the instructor please include "ENPM665" in the Subject line.

ELMS Link: https://umd.instructure.com/courses/1329071

Course Description

This course will cover the fundamentals of securing cloud-based workloads from the ground up with many hands-on examples. Through these hands-on exercises the course will demonstrate where the similarities and differences are when securing the cloud compared to securing traditional IT. Topics include cloud-specific issues when designing secure applications, managing identity and access, protecting data, handling incident response, conducting penetration tests, and forensics in the cloud. In addition to midterm and final projects, students will perform hands-on exercises and homework assignments to reinforce the lecture material. While we will primarily focus on Infrastructure-as-a-Service we will also discuss Platform-as-a-Service and Software-as-a-Service, specifically around security considerations for those services.

Learning Outcomes

After successfully completing this course you will be able to:

- Understand the similarities and differences between securing cloud-based workloads vs traditional IT.
- Develop and implement a secure migration path for a workload into the cloud.
- Understand the challenges of securing data in the cloud and the best practices to protect data in the cloud.
- Perform incident response in the cloud.

Office Hours – via Zoom link in ELMS

Professor:

- Mondays from 11:30am - 1pm
- by appointment (email to request an appointment)

TA:

- Tuesdays from 5:30pm – 7pm
- Thursdays from 5:30pm – 7pm
- by appointment (email to request an appointment)

Required Technology:

This is a hands-on class. Students will need a computer and will need to create accounts with Amazon Web Services, Microsoft Azure, and Google Cloud Platform. The hands-on exercises conducted will all involve work that should be either no charge, within the free tiers of Amazon Web Services, Microsoft Azure, and Google Cloud Platform, or covered by the free credits these cloud vendors give new accounts. **Students should plan to set aside $50 to cover any incidental costs of running exercises in these cloud environments.**

Grading

The grade breakdown is as follow:

5 Homework Assignments (8 pts/each)	40 points
Midterm Project	30 points
Final Project	30 points
Total	**100 points**

Late Midterm/Final/Homework Assignment Policy: It is expected that assignments will be submitted on time. Late assignments will have 10% of the points deducted for every day the assignment is late. Assignments submitted over one week late will not be accepted or graded. If there are extenuating circumstances for you to submit work late please contact the instructor as soon as possible along with proof of your extenuating circumstance (preferably before the assignment is due.)

Religious Observances: It is the student's responsibility to inform the instructor of any intended absences for religious observances in advance. Notice should be provided as soon as possible but no later than the end of the schedule adjustment period.

Grade Breakdown:

A+ = 100 – 99	**B+** = 89.99 – 89	**C+** = 79.99 – 79	**D+** = 69.99 – 69	
A = 98.99 – 90.01	**B** = 88.99 – 80.01	**C** = 78.99 – 70.01	**D** = 68.99 – 60.01	**F** = 59.99 – 0
A- = 90	**B-** = 80	**C-** = 70	**D-** = 60	

Extra Credit: Extra credit is not offered for this class. Do the work and you'll be fine.
Curve: There will be no curve for the class. Do the work and you'll be fine.
Rounding: There will be no rounding up/down of grades. Do the work and you'll be fine.

- **All assignments must be submitted via ELMS. Assignments submitted outside of ELMS will not be accepted or graded.**
- **Assignments are not completed until they are submitted in ELMS.**
- **The only timestamp that matters is the one in ELMS.**
- **Check that you have submitted the correct assignment after you have uploaded it.**

Grade Disputes: All grading concerns must be sent to the instructor via e-mail within 2 weeks of the grade being posted. If the instructor elects to review your assignment it will be for an exhaustive re-grade and your score for the assignment may go up or down depending on what the re-grade determines.

Questions/Troubleshooting Matrix

Support Item	Support Contact
Class administrative issues	1. Review the syllabus 2. Review the week 1 slides 3. Contact the professor
Grading concerns	Contact the professor
Technical questions	1. Google 2. Contact the TA 3. Contact the Professor
ELMS/Canvas issues	IT Support- https://itsupport.umd.edu/
Issues with lecture video capture/playback	DETS - dets-support@umd.edu

Code of Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity of the Student Honor Council, please visit http://shc.umd.edu/SHC/HonorPledgeInformation.aspx

OPTIONAL Textbooks

- Vehent, Julien, **Securing DevOps**, Manning Publications, 2018. ISBN: 978-1617294136

- Malisow, Ben, **CCSP (ISC)2 Certified Cloud Security Professional Official Study Guide, 2nd edition** Sybex, 2019. ISBN: 978-1119603375

The instructor reserves all rights to update the syllabus as needed. Notification of changes will be sent and previous versions of the syllabus will be kept in ELMS for student review.

Course Schedule

Week 1	**August 31st – Introduction & Administrivia** **Homework #1 issued** Optional reading: CCSP book chapters 1, 5 , 6
Week 2	**Sept 7th – Securing the Cloud – IaaS, PaaS, SaaS**
Week 3	**Sept 14th – Designing and Redesigning Secure Applications for the Cloud** **Homework #1 due** Optional reading: CCSP book chapter 7
Week 4	**Sept 21st - Identity and Access Management for the Cloud** **Homework #2 issued** Optional reading: CCSP book chapter 7
Week 5	**Sept 28th – Protecting Data in the Cloud** **Midterm Project issued** Optional reading: CCSP book chapters 3, 4
Week 6	**Oct 5th – Compliance in the Cloud** **Homework #2 due** Optional reading: CCSP book chapters 10, 11
Week 7	**Oct 12th – Deep Drive: Amazon Web Services** **Homework #3 issued**
Week 8	**Oct 19th – NO CLASS: WORK ON YOUR MIDTERM**
Midterm Project Due Friday October 21st @ 11:59pm	
Week 9	**Oct 26th – Deep Dive: Microsoft Azure**
Week 10	**Nov 2nd – Deep Drive: Google Cloud Platform** **Homework #3 due, Homework #4 issued**
Week 11	**Nov 9th – Incident Response and Forensics in the Cloud**
Week 12	**Nov 16th – Vulnerability Scanning and Penetration Testing in the Cloud** **Homework #4 due; Homework #5 and Final Project issued**
Week 13	**Nov 23rd – THANKSGIVING BREAK - NO CLASS** You should get started on your final project (if you haven't already)
Week 14	**Nov 30th – Deep Dive: Securing SaaS Applications** **Homework #5 due**
Week 15	**Dec 7th - Course wrap up**
Final Project Due Friday December 16th @ 11:59pm	

All times are based on Eastern Standard Time/Eastern Daylight Time, the time zone UMD is physically located in.