Launching into Cybersecurity – Units 10 - 12

This 12-week module comprises an introduction of the various core elements of the 2-year Master of Science in Cybersecurity program at University of Essex, Colchester England. Class of 2023. It intends to ensure a basic understanding of the primary skills that will be covered in greater detail during subsequent modules. It also provides insight and understanding of how the various specialties and occupational roles combine to provide a robust body of knowledge and skillset required to succeed in the field. While the student's final niche of practice may focus on only a few of the areas covered, it is beneficial to all who would master this critical field to gain a fuller understanding of the contribution and importance of all elements. As the units tend to build one up on another and contain summary review and reflection every few units, these journal entries will follow a similar track and cover three units in each.

This summary focuses on units 10-12 and the stated learning objects are:

- Understand the concepts and principles of web applications development.
- Appraise the techniques and frameworks for secure web application development.
- Develop an awareness and understanding of the industry standards and guidelines for securing web applications.
- Implement the MVC architecture for web application.
- Implement security libraries for user access controls, verification, and authentications.
- Apply the concepts and principles of web applications development.
- Develop the ability to evaluate frameworks for secure web application development.
- Apply industry standards and guidelines to secure web applications.
- Develop an awareness of emerging trend and future developments in Cyber Security.
- Engage with research activities in the various areas of Cyber Security.
- Understand the implications of future developments on privacy and data confidentiality.

Initial, Pre-unit Baseline

I began these units with extensive experience in creating websites. Or so I thought. For years I had been using WYSIWYG tools that compiled my simple text to HTML pages. This unit would force me to revisit the underlying code of various web programming languages and to understand the security issues of web-based applications.

Progressive Learning Experience.

In addition to the collaborative discussions and lecturecasts, completed structured coding exercises in HTML, CSS, Javascript and markdown using the Codio sandbox

Completed Codio exercises in HTML5, Django web framework and critically examined differences between HTML5 and Django.

Submitted for feedback, an outline of the code planned for the end of module project during unit 12.

Viewed lecturecast: A look into the future of Cyber Security. Explored current, ongoing research activities and future forecasting of emerging technologies for improved cybersecurity and privacy.

Completed end of module project comprising python code to address one of the security issues raised in technical report fin unit 9. Full project background, code outline and python code with run results can be viewed via a separate link on module page.

Personal Take-Away for Units 10 - 12

I'm gaining confidence and competency in coding which will prepare me to analyze software and database structure during security reviews. First ever exposure to Django, adding a new tool to my kit.

Essential Reading

Mandez, M. (2014) *The Missing Link: An Introduction to Web Development and Programming*. Createspace Independent Publishers.

Behrens, M. (2012) *The Django Book*. Sphinx. Available from https://django-book.readthedocs.io/en/latest/index.html

Contributor, MDN. (2019) MVC, Mozilla.

Maras, M.H. (2015) Internet of Things: security and privacy implications. *International Data Privacy Law* 5(2).

Additional Reading

Guide, G. (2020) *Web programming languages: the best languages for web development.* IONOS.

Netspaker Security Team (2019) *Getting Started with Web Application Security application-security*.

Williams, L. (2019) *Secure Software Life Cycle Knowledge Area Issue 1*. The Cyber Security Body of Knowledge.

Rashid, A., Nautiyal, L. & Rigby, Y. (2020) *Cyber Security at Scale: Challenges for Research, Education and Training.* The Cyber Security Body Of Knowledge.

Shi, W. & Dustdar, S. (2016) The promise of edge computing. *Computer* 49(5): 78-81.

Xu, X. (2012) From cloud computing to cloud manufacturing. *Robotics and computer-integrated manufacturing*. 28(1): 75-86.

Miraz, M.H., Ali, M., Excell, P.S. & Picking, R. (2015) A review on Internet of Things (IoT), Internet of everything (IoE) and Internet of nano things (IoNT). *In 2015 Internet Technologies and Applications (ITA) IEEE* pp.219-224.

Li, S., Da Xu, L. & Zhao, S. (2018) 5G Internet of Things: A survey. *Journal of Industrial Information Integration*. 10:1-9.

Balasubramaniam, S. & Kangasharju, J. (2012). Realising the internet of nano things: challenges, solutions, and applications. *Computer* 46(2): 62-68.