Launching into Cybersecurity – Units 4 - 6

This 12-week module introduces the various core elements of the MSc. Cybersecurity programme at the University of Essex Online. It intends to ensure a basic understanding of the primary skills covered in complete detail during all relevant modules. It also provides insight and understanding of how the different practices and occupational roles combine to offer a robust body of knowledge and skillset required to succeed in the field. Furthermore, 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 upon another and contain summary review and reflection every few units, these note entries will follow a similar track and cover three units in each.

This unit summary covers units between 4 - 6, and the stated unit outcomes are:

- Develop solutions that will efficiently identify vulnerabilities and threats in software and over networks.
- Develop security requirement documents to ensure security is embedded in a software development process.
- Develop the capacity to predict security issues in software and develop appropriate solutions to deal with them.
- Develop the ability to apply concepts and principles of secure object-oriented analysis and design.
- Develop the knowledge and skills required for programming.
- Develop the ability to implement a security designed solution.
- Develop the ability to identify the software components and associated threats.
- Employ the UML modelling techniques to identify software dataflow, storage, and security issues.
- Apply the knowledge and skills to other security issues in software development.

Progressive Learning Experience

Dealing with secure object-oriented analysis and design has been a new territory. I have learned the basics of designing secure databases and how to perform pre-coding modelling of use cases and abuse cases using Universal Modeling Language (UML). Unit 6 wrapped up with an 'outline' for a technical report on the security issues, risks and potential controls involved in developing a secure web-based appointment scheduling system for a large medical centre. Due in unit 9, the report will include UML diagrams for both use and abuse cases and recommend controls for each. This scenario will be the final part for the end of course project due in unit 12, which includes a detailed description of one of the issues identified in this essay and applies a custom control via original python code.

Personal Take-Away for Units 4 - 6

The collaborative discussions and critical analysis of other students were valuable in expanding viewpoints and critical analysis.

Essential Readings

During these units, following reading assignments are completed

- *Howard M. and LeBlanc. D. (2003). Writing Secure Code. 2nd ed. Microsoft Press.*
- *Ambler, S. W. (2003) The Elements of UML Style. Cambridge, UK: Cambridge University Press*
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Additional Readings

During these units, following reading assignments are completed

- *Anderson, R. (2008) Security Engineering: A Guide to Building Dependable Distributed Systems. 2nd ed. Wiley.*
- *Damodaran, M. (2006) Secure software development using use cases and misuse cases. Issues in Information Systems 7(1): 150-154.*
- *Khan, R., McLaughlin, K., Laverty, D. & Sezer, S. (2017) STRIDE-based threat modelling for cyber-physical systems. IEEE PES Innovative Smart Grid Technologies Conference Europe (ISGT-Europe), Torino.1-6.*
- *Vazquez, F. (2019) Graph Databases. What's the Big Deal. Towards data science. van Rossum, G., Warsaw, B. & Coghlan, N. (2013) Python Developer's Guide.*