Units titles and Activities:

Unit 2: Users, Assessments and the Risk Management Process

Welcome to Week 2 where we will conduct a deeper dive into the Risk Management Process – specifically looking at the effect of different types of assessment (Qualitative vs. Quantitative) and the role and importance of user participation in the process.

In this unit we shall:

- Review the Risk Management Process (RMP).
- Review the effects of different assessment types (Qualitative vs. Quantitative).
- Discuss potential changes to the RMP based on changes in user participation.

On completion of this unit you will be able to:

- Discuss the differences between assessment approaches (Qualitative vs. Quantitative).
- Explain the importance of user participation in the risk management process.
- Discuss the implications of any recommended mitigations.

The seminar this week will give students an opportunity to review and reflect on the RMP and discuss the importance of assessment approaches and user involvement in the process.

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Reading| 4 hrs

The reading this week focusses on a study by Spears & Barki (2010) that looks at both the effect of user participation on the Risk Management Process, as well as spending significant time discussing the different approaches to assessment – that is Qualitative vs. Quantitative.

Welcome to Week 3 where we will discuss various approaches to Threat Modelling. We will discuss a number of popular approaches including STRIDE and DREAD, Attack Trees and hybrid models such as the Process for Attack Simulation and Threat Analysis (PASTA). We will also introduce some guides and cookbooks that can be used to help in selecting which framework to use.

In this unit we shall:

- Discuss the difference between threats and vulnerabilities.
- Review a number of threat modelling techniques.
- Discuss a number of guides and cookbooks to help with threat modelling.

On completion of this unit you will be able to:

- Describe a number of threat modelling techniques.
- Advise which technique should be used in specific situations.
- Discuss when techniques should be combined in a hybrid model.

This week introduces students to the differences between threats and vulnerabilities and introduces a number of threat modelling and management tools.

Unit 4: Application of Threat Modelling and Management Techniques

Welcome to Week 4 where we will practice threat modelling and management, guided by the threat modelling manifesto, the OWASP cookbook and the Mitre ATT&CK database.

In this unit we shall:

- Discuss various tools and resources that can be used in threat modelling and management.
- Evaluate the use of publicly available tools to assist with Threat Modelling.
- Create threat models based on suggested scenarios.

On completion of this unit you will be able to:

- Describe where to find the key tools and resources used for threat modelling.
- Explain how to select the most appropriate tool for various situations.
- Critically evaluate the use of such tools.

This is a key module in that it introduces students to the topic of threat modelling which is a core competency both for cyber security and development teams.

Unit 5: An Introduction to Security and Risk Standards in Industry and the Enterprise

Welcome to Week 5 where we will look at another crucial aspect of Security and Risk Management – industry and enterprise standards. This module will discuss the role of standards in risk assessments and risk designs and will also discuss some of the implications of risk standards for various industries.

In this unit we shall:

- Explore industry specific security standards and directives.
- Discuss how standards affect security and risk assessments.
- Review a number of common industry and enterprise standards.

On completion of this unit you will be able to:

- List common security standards and select the appropriate one(s) for a given situation.
- Describe how to allow for standards in typical threat models.

This unit describes the key roles that risk assessment, management and security standards play in security and risk management and planning.

Unit 6: The Practical Implications of Security and Risk Standards

Welcome to Week 6 where we focus on the standards that define security compliance for a number of industries. This will build on the material presented in the previous unit.

In this unit we shall:

- Review and discuss a number of GDPR related case studies.
- Review standards web sites.
- Discuss a number of case studies and standards.

On completion of this unit you will be able to:

- Explain which GDPR regulations are applicable in specific situations.
- Describe which other standards might apply in selected situations.
- Advise on mitigations to help a business meet any of the standards applicable to its specific industry (such as data and privacy (GDPR) or financial (PCI-DSS)).

This unit helps students understand how standards fit into Security and Risk Management strategies and plans.

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Reading| 2 hrs

The reading this week focuses on security standards and recommendations, including GDPR. The reading will consist of chapters from a supplementary text (Campbell (2016), as well as suppliers and government sources including the GDPR, PCI-DSS and the ISO 27000 web sites. There is also a case study based on data available.

Unit 7: An Introduction to the Concepts of Quantitative Risk Modelling

Welcome to Week 7 where we will review a selection of methods that can be used as part of quantitative risk modelling. These include probabilistic approaches such as Monte Carlo simulations and Bayes theorem-based methods, as well as multi-criteria decision analysis techniques such as TOPSIS, AHP and ANP.

In this unit we shall:

- Discuss what is meant by quantitative risk modelling (QRM).
- Review different approaches to QRM including Monte Carlo Simulations and Bayes theoretical models.
- Discuss the principles and antipatterns for each approach.

On completion of this unit you will be able to:

- Utilise quantitative risk modelling techniques to produce risk models.
- Select the most appropriate technique based on the real-world problem.
- Critically evaluate the pros and cons of the approach selected.

This unit provides the student with an introduction to the tools and techniques required to carry out quantitative risk modelling.

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Lecturecast| 1 hrs

This lecturecast will cover:

- The two major approaches to risk modelling.
- The major quantitative risk modelling approaches.
- What MCDM, Monte Carlo, and Bayesian approaches are.

- When to use each of the above approaches.

- **Quantitative Risk ModellingSCORM package**

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  Reading| 8 hrs

  The reading this week focuses on the theory behind the Monte Carlo method and Bayes theorem as a background to creating quantitative risk models. In addition, you should read the course text (Olsen & Desheng, 2020) and study the case studies provided.

Unit 8: Implementing Quantitative Risk Models.

Welcome to Week 8 where we will demonstrate the use of Monte Carlo simulations and Bayes Theorem to apply quantitative risk modelling (QRM) to real world problems. We will discuss the application of these techniques as part of the project management process and as a safety estimating tool.

In this unit we shall:

- Discuss how QRM can be applied to real world problems.
- Review case studies of how QRM techniques are used.
- Provide a critical evaluation of some of the techniques available.

On completion of this unit you will be able to:

- Select the most appropriate modelling technique to use in a given situation.
- Create a QR model of a real-world situation.
- Provide a critical appraisal of the use of QR techniques.

This unit provides students with the skills and techniques to build a QR model of a real-world situation.

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  Reading| 8 hrs

  The reading this week focusses on case studies of the use of QR models, as well as studies that critically evaluate the use of such techniques.

Unit 9: Risk, Business Continuity and Disaster Recovery

Welcome to Week 9 where we will discuss two of the most important tools in the armoury of risk management and mitigation: namely business continuity and disaster recovery plans.

In this unit we shall:

- Review how and why to create business continuity (BC) and disaster recovery (DR) plans.
- Discuss the main determining factors in BC/DR plans – including Business Impact Assessments (BIA), Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs).
- Discuss emerging trends in Information Risk Management.

On completion of this unit you will be able to:

- Explain what is meant by BC, DR, RTO and RPO.
- Suggest the most suitable solutions to meet specific recovery objectives.
- Discuss some of the factors driving the future of the Information Risk Management field.

This week discusses the importance of business continuity and disaster recovery plans and provides a number of strategies that can be leveraged to address various DR requirements.

Unit 10: Practical Applications and Issues in DR Implementations

Welcome to Week 10 where we will discuss the practical aspects of disaster recovery (DR) and explore some typical designs for a DR solution.

In this unit we shall:

- Discuss the impact of RPO and RTO values on DR solutions.
- Examine some typical system solutions to meet the various standby requirements.
- Describe the limitations of the proposed solutions.

On completion of this unit you will be able to:

- Design a solution that will meet a set of RPO and RTO requirements.
- Describe the advantages and disadvantages of DRaaS.

- Discuss the challenges with vendor lock-in, resilience and (network) security.

  This unit addresses the practical aspects of DR design and provision – and provide a critical review of many of the accepted assumptions of such designs.

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  Reading| 2 hrs

  The reading this week focuses on the practical implementation of DR strategies and some of the issues and challenges of implementation – including around solutions such as DRaaS.

  Unit 11: Future Trends in Security and Risk Management

  Welcome to Week 11 where we will review current and emerging trends in security and risk management. We will examine trends and inputs from several areas including economic theory, AI and automation.

  In this unit we shall:

- Review a number of current and emerging trends in SRM.
- Discuss the pros and cons of each trend.
- Evaluate each trend in respect of its influence on future directions.

  On completion of this unit you will be able to:

- Describe the main emerging trends in the field.
- Explain their potential impact on research.
- Recommend which you think will be most influential.

  This unit reviews current and emerging trends in the SRM field and provides material to help students evaluate their potential impact.

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  Lecturecast| 1 hrs

  This lecturecast will cover:

  - The emerging trends in the Security and Risk field.
  - The most likely solutions to meet specific objectives.
  - The factors driving the future development of the field.

- Future TrendsURL

Reading| 6 hrs

The reading this week focuses on emerging trends in the risk science and management based on a paper by Aven (2016). There are additional articles in the reading list that will act as preparation for next week's seminar.

Unit 12: The Great Debate: What will be the most influential trend in SRM in the next 5 years?

Welcome to Week 12 where we will debate the question "what will be the most influential trend in SRM in the next 5 years?". This will be based on the reading material (and lecturecast) from Unit 11, plus your entries in the Wiki (also created in Unit 11).

In this unit we shall:

- Debate the question, split into two opposing 'teams'.
- Complete the wiki entries for the future trends reading.
- Vote and decide the most influential trend.

On completion of this unit you will be able to:

- Describe the main emerging trends in the field.
- Argue for which you believe to be the most influential.
- Cast your vote for the trend you support.

This unit pulls together the learning from the previous units, and also presents a number of emerging trends for students to evaluate and vote on.

Reading| 2 hrs

The reading this week focusses on current and emerging trends as listing in the reading list.