School of Computing and Information Systems

Unit Outline

KXC362 Computer Security

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Hangzhou, China

Unit Coordinator

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UNIT OVERVIEW

Introduction

This unit aims to introduce students to the principles behind the techniques and strategies that can be used to keep computer systems at a desired level of security. It is designed to alert anyone who might have responsibility for a computer system to the security issues that they should consider and equip them with an understanding of how to establish the threats that they might face and the ability to evaluate the techniques that they can use to counter these threats.

These techniques include threat and risk analysis, the characteristics of encryption algorithms and how to use these to achieve particular security goals, authentication techniques, operating system and network security, Internet security and associated protocols, concluding with business continuity planning.

Prerequisites

KXC151

Unit Weight

12.5% of one academic year

Teaching Pattern

Lectures: 3 hours per week
Tutorials: 1 hour per week

Unit Content

The following list provides an indication of the topics which will be covered in the unit.

1. Overview of unit content and introductory concepts
2. Threats, Risk Analysis and Security policies
3. Established Business Techniques
4. Physical Access Control
5. Authentication and Logical Access Control
6. Cryptography and cryptographic algorithms
7. Using cryptographic algorithms to achieve security goals
8. SNMPv3
9. Kerberos
10. Digital signatures
11. Security in Operating systems
12. Security standards
13. Network Security
14. Firewalls
15. Intrusion Detection
16. Security Goals for eCommerce
17. Public Key Ownership and PKI
18. Business Continuity Planning

For more information see the section titled 'Content' on the unit website.

**Learning Outcomes**

On successful completion of this unit, you will be able to:

1. Analyse the threats and vulnerabilities in computer systems and evaluate countermeasures
2. Use the principles and justify the application of security countermeasures such as policies, physical security, access control, cryptography, operating system security and network security techniques
3. Evaluate the various protocols for electronic authentication of identity
4. Explain the process of creating a business continuity plan
5. Work in a team to research and produce a solution to a problem concerning a computer security technique, application or problem

**Generic graduate attributes**

The university has defined a set of generic graduate attributes expected in its graduates. [http://www.utas.edu.au/policy/subject.html#graduates](http://www.utas.edu.au/policy/subject.html#graduates) Your course is designed to enable you to develop generic skills that are valued in, and expected of, graduates. These are skills that you will need to develop over time. Hence you are encouraged to look for opportunities, as you study each unit, to reflect on and improve these skills.

In this unit these skills are specifically targeted:

*Knowledge*: Students will have the opportunity to apply their technical and information skills and learn co-operatively by working together in the assignment case study.

*Communication Skills*: Students will further develop their communication skills and ability to write reports by giving presentations in tutorials and submitting a written tender proposal.

*Problem-solving skills*: Students will be required to conceptualise problems and formulate a range of solutions by working effectively with others to produce a written tender proposal.

*Social Responsibility*: Students will learn to acknowledge the social and ethical implications of their actions by examining the results of hacking and computer fraud.

**UNIT ASSESSMENT**

**Assessment Pattern**

Internal (30%), Exam (70%)

**Assessment Summary**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>10%</td>
<td>Six take-home pieces of work at intervals</td>
</tr>
<tr>
<td>Assignment 2 - Tender Proposal for a Case Study</td>
<td>20%</td>
<td>Thursday 18th Dec at 3pm</td>
</tr>
<tr>
<td>Formal Examination</td>
<td>70%</td>
<td>University Examination Period</td>
</tr>
</tbody>
</table>

**Assessment Items**

**Item 1**

**Title**: Assignment 1  
**Type**: In-Semester - learning tasks  
**Task Length**: not applicable  
**Weighting**: 10%  
**Links to Learning Outcomes**: 1, 2, 3, 4  
**Due**: Six take-home pieces of work at intervals  
**Description**: There will be six take home pieces of work that you will have to complete within 24 hours. Your score on each of your five best of these will be used to calculate your result, based on each of the five contributing up to 2% of your overall mark.

**Item 2**

**Title**: Assignment 2 - Tender Proposal for a Case Study  
**Type**: In-Semester - group assignment  
**Task Length**: not applicable  
**Weighting**: 20%
Description: This assignment is a group assignment. It requires you to work steadily during semester, beginning with the second tutorial. Tutorials 2, 3, 4, 7, 8, and 10 provide you with an opportunity to develop and obtain feedback on your ideas for the content of this assignment.

Item 3
Title: Formal Examination
Type: Formal Examination
Task Length: 3 hours
Weighting: 70%
Links to Learning Outcomes: 1, 2, 3, 4
Due: University Examination Period
Description: Students are allowed to take two A4 sides of handwritten notes into the exam. These notes are handed in with the exam paper.

See the 'Assessment' section in unit website for more detailed information about assessment items.

How your Final Grade will be determined
Overall assessment will be based on the student's performance throughout the semester as well as in a formal examination. In order to achieve a pass (or better) result, a student must obtain:

1. at least 45% of the total mark for in-semester assessment items
2. at least 45% of the mark for the formal examination
3. at least 50% of the overall mark

UNIT RESOURCES

Unit Web Site
This unit is Web Supplemented. This means that the use of the Web is optional for this unit. The unit website contains unit information and resources. The unit website is accessed from http://www.utas.edu.au/coursesonline/. You will need to use your University of Tasmania email pop account username and password to log on to the MyLO system. Once authenticated by the system your personalised MyLO Learning Online area will be displayed. It contains links to the websites that you have permission to access - including the website for this unit.

If you are not able to access the unit website, please contact the technical staff at ZUT.

Prescribed Text
None

Readings

A list of readings referred to in the lecture slides can be found on the unit website in the resources area. The reference list is intended as a resource to help you with understanding the unit content when you need some extra explanations, or material for an assignment.

I have added my comments about the strengths of each book. For example:

Gollmann, D. 2000, Computer Security, John Wiley and Sons [especially good on operating system security and access control]

Software
The software that you will need to access the unit website and to study this unit, including general purpose software such as word processors, is provided on the computers in the computing labs. If you intend to use software on other computers please check that the versions are compatible. You will be using the email security software called PGP - Pretty Good Privacy for one tutorial in this unit. A copy of the freeware version is provided on CD.

GENERAL RESOURCES

School Website
School of Computing and Information Systems - Faculty of Science, Engineering, and Technology.
http://www.cis.utas.edu.au

Faculty Website
Information and Resources for Faculty of Science, Engineering and Technology students are available on the faculty website at: http://www.utas.edu.au/scieng
University Website

Information and Resources for 'Current Students' are available on the university website at:
http://www.utas.edu.au/students/

School Help Desk

Contact technical staff at ZUT for information about accessing and using the Computer labs.

University Services and Support

If you are experiencing difficulties with your studies or assignments, have personal or life planning issues, disability or illness which may affect your course of study, you are advised to raise these with your lecturer in the first instance.

The University has staff available to assist you, such as the:

- Learning Development Advisor
- Student Counselor
- Careers Advisor
- Disability Officer

For more information and contact details see the Services and Support section on the University 'Current Students' web page: http://www.utas.edu.au/students/

GENERAL ASSESSMENT

Approach to Learning

The University is committed to high standards of professional conduct in all activities, and holds its commitment and responsibilities to its students as being of paramount importance. Likewise, it holds expectations about the responsibilities students have as they pursue their studies within the special environment the University offers.

The University's Code of Conduct for Teaching and Learning states:

Students are expected to participate actively and positively in the teaching/learning environment. They must attend classes when and as required, strive to maintain steady progress within the subject or unit framework, comply with workload expectations, and submit required work on time.

You are expected to spend about 130 hrs studying in this unit - this includes attendance at scheduled teaching sessions. (For a 13 week semester this is, on average, 10 hr/wk.) This is the amount of study time that the 'typical' student will need to reach the level of competence and understanding required to fulfill the unit objectives. You are expected to:

- attend all scheduled teaching sessions, unless otherwise notified by the unit coordinator
- prepare for, and actively participate in all scheduled teaching sessions
- complete the assigned learning tasks
- review what has been learnt
- complete assessment items and submit them on time
- access and be familiar with the information and resources available on the unit website
- seek help from teaching staff if you have any questions or difficulties in studying this unit

You are encouraged to read the university's Code of Conduct for Teaching and Learning. Part A describes the 'Responsibility of the University to Students' and part B describes the 'Responsibilities of Students to the University'.

It is expected that students will familiarise themselves with access and use of the MyLO system operated by the University for the electronic delivery of course materials, and for various forms of communication.

It is expected that students will consult email sent to their University email address at least twice a week for notices relating to the administration of the unit, and for notification of the results of assignments.

It is expected that students will read the background material specified in the course curriculum, will actively attend and participate in tutorials, and be prepared to discuss relevant issues arising with tutors, lecturers and fellow students.

Student Expectations of the Unit

Students enrolled in this Unit may reasonably expect the following:

1. To be able to contact a lecturer or tutor by electronic mail, to raise issues arising in the unit, either relating to content or student performance within the unit.
2. Subject to availability, to be able to discuss such issues in person with the lecturer or tutor.
3. That assignments will be marked and the marks will normally be returned within 3 weeks of due dates.
4. That all relevant notices regarding the administration of the unit, including any necessary changes, will be communicated to all students enrolled in the unit via email.
These expectations are in addition to those specified in relevant University regulations.

Plagiarism

Unless specifically stated in the specification of the assessment item provided on the unit website, it is required that:

- work submitted by a student is the work of that student alone OR
- where the assessment item is to be completed by a group of students, the work submitted by the group of students is the work of that group of students alone.

While students are encouraged to discuss the assignments in this unit and to engage in active learning from each other, it is important that they are also aware of the University’s policy on plagiarism. Plagiarism is taking and using someone else’s thoughts, writings or inventions and representing them as your own; for example downloading an essay wholly or in part from the internet, copying another student’s work or using an author’s words or ideas without citing the source.

"Plagiarism is a form of cheating. It is taking and using someone else's thoughts, writings or inventions and representing them as your own; for example, using an author's words without putting them in quotation marks and citing the source, using an author's ideas without proper acknowledgment and citation, copying another student's work.

If you have any doubts about how to refer to the work of others in your assignments, please consult your lecturer or tutor for relevant referencing guidelines, and the academic integrity resources on the web at http://www.academicintegrity.utas.edu.au.

The intentional copying of someone else's work as one's own is a serious offence punishable by penalties that may range from a fine or deduction/cancellation of marks and, in the most serious of cases, to exclusion from a unit, a course or the University. Details of penalties that can be imposed are available in the Ordinance of Student Discipline – Part 3 Academic Misconduct, see http://www.utas.edu.au/universitycouncil/legislation/.

The University and any persons authorised by the University may submit your assessable works to a plagiarism checking service, to obtain a report on possible instances of plagiarism. Assessable works may also be included in a reference database. It is a condition of this arrangement that the original author's permission is required before a work within the database can be viewed."

It is important that you understand this statement on plagiarism. Should you require clarification please see your unit coordinator or lecturer. Useful resources on academic integrity, including what it is and how to maintain it, are also available at: http://www.academicintegrity.utas.edu.au

Referencing

The preferred text referencing systems for the School is the Harvard system (also referred to as the author-date system). In your written work you will need to support your ideas by referring to scholarly literature, works of art and/or inventions. For information on presentation of assignments, including referencing styles: http://utas.libguides.com/referencing

It is important that you understand how to correctly refer to the work of others and maintain academic integrity. Failure to appropriately acknowledge the ideas of others constitutes academic dishonesty (plagiarism), a matter considered by the University of Tasmania as a serious offence. The university document on plagiarism contains information about referencing the work or ideas of others (see http://www.utas.edu.au/plagiarism/).

Submissions

The details of the submission method (paper, electronic or other) for each assignment will be supplied in a separate assignment specification sheet. All in-semester assignment submissions (including electronic submissions) are to include an Assignment Cover Sheet which includes a statement confirming that the submission is your own work. If this undertaking is not signed, the assignment will not be marked. The Assignment Cover Sheet is available on the School's web site http://www.cis.utas.edu.au/cisview/resources.jsp.

Extensions

Assessment items will not be accepted after the due date except under the conditions stated in the School policy on late assessment. http://www.cis.utas.edu.au/downloads/ExtensionPolicy.pdf (PDF - 100KB).

Review of Assessment and Appeals

1. It is expected that students will adhere to the following policy for review of any piece of continuous assessment.
   a. Within 5 days of the release of the assessment result, the student should request an appointment with the Lecturer. The student should be prepared to discuss specifically which section of the marking criteria they are disputing and why they consider the mark is inappropriate.
   b. Following this discussion, students may request a formal remark of the original submission (in accordance with Rule of Academic Assessment 111, clause 22.1). This remark will be undertaken, where
practicable, by an alternative assessor.


**Complaints Procedure**

It is expected that students will adhere to the following policy for making any complaint or grievance directly related to a Unit:

a. In the first instance, students are to approach the Lecturer or Unit Coordinator concerned and arrange a time to speak with them about their concern.

b. If an issue remains unresolved, the student should approach the Head of School and arrange a time to speak with them about their concern.

If the School’s internal policy of complaints is unable to resolve an issue, students should consult Ordinance 8 Student Complaints for further direction, see [http://acserv.admin.utas.edu.au/complaints_info.html](http://acserv.admin.utas.edu.au/complaints_info.html)

**Formal Examination**

The formal examination will be held at ZUT, Hangzhou, and is conducted by the University Registrar.

**Final Grade**

Passing grades will be awarded based on the AVCC guidelines:

- PP at least 50% of the overall mark but less than 60%
- CR at least 60% of the overall mark but less than 70%
- DN at least 70% of the overall mark but less than 80%
- HD at least 80% of the overall mark

In order to comply with the benchmarks set by the Faculty of Science, Engineering & Technology for distribution of grades in units, both the in-semester and examination marks that students obtain may be adjusted either upwards or downwards. See [http://fcms.its.utas.edu.au/scieng/scieng/policies.asp](http://fcms.its.utas.edu.au/scieng/scieng/policies.asp) for details of the Faculty Assessment Guidelines.