OVERVIEW

Introduction
This advanced computing elective 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.

Prior Learning
It is assumed that students:
• can use binary and hexadecimal notation plus simple logic functions
• that they are used to using systems that require them to identify and authenticate themselves, prior to being provided with access to resources that match their status in the system
• that they understand simple networking concepts

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 underlying security countermeasures such as policies, physical security, access control, cryptography, operating system security and network security techniques and and justify the application of these
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

**Unit Content**

The following timetable provides an indication of the planned lecture topics content.

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. Hash algorithms and SNPMTv3
8. Symmetric key algorithms and Kerberos
9. Public key algorithms and digital signatures
10. Security in Operating systems
11. Security standards
12. Network Security
13. Firewalls
14. Intrusion Detection
15. Public Key Ownership and PKI
16. Protocols for securing Internet Transactions
17. Inference Attacks
18. Business Continuity Planning

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

**Generic Skills**

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.

**LEARNING AND TEACHING**

**Approach to Learning**

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 fulfil the unit objectives.

You are expected to:

- attend all scheduled lectures and tutorials, unless otherwise notified by the unit coordinator
- prepare for, and actively participate in lectures and tutorials
- 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 will also be expected to spend time working with members of your assignment group.

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’. [http://www.utas.edu.au/tl/policies/codes.html](http://www.utas.edu.au/tl/policies/codes.html)

**Schedule**

See the ‘Schedule’ section on the unit website.

**Teaching and Support**

**Teaching Staff**
Support

Staff

Unit Coordinator:

Jacky Hartnett
E-Mail: J.Hartnett@utas.edu.au
Phone: (03) 6324 3392
Room: V120, Newnham Campus, Launceston

School Help Desk

Contact the School Help Desk if you have any queries or problems with accessing, using, or printing from the computers in the School of Computing labs.

- **Hobart**: the Help Desk is located near the School's reception desk and is open from 10am - 4pm Monday-Friday. The phone number is 6226 2960.
- **Launceston**: the Help Desk is located near the entrance to the computing labs and is open in the morning from 10am - 12pm, and in the afternoon from 2pm - 4:30pm, Monday-Thursday. On Fridays it is open from 10am - 12pm in the morning and 2pm - 4pm in the afternoon. The phone number is 6324 3447.
- **Burnie**: the computer labs at the NWC are maintained by ITS. Please contact the University Help Desk for assistance. The 6 Macs are maintained by the School of Computing. If you have a query or problem that is specific to the School of Computing please phone the School of Computing Help Desk in Launceston.

University Services and Support

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/](

Resources

Unit Website

The unit website contains unit information and resources. You are strongly recommended to look at and use the resources that are contained on the website. This is because much of it supports your assignment work or is designed to help you with your examination preparation. General feedback on assignments and other questions raised by the class will also be provided on this site.

Prescribed Text


This is out of print in Australia and available for purchase as a photocopy from UniPrint or from the bookshop as an import from the USA.

Readings

A reading list, together with comments on the useful sections, can be found on the unit website.

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 School's computing labs. If you intend to use software on other computers please check that the versions are compatible.

You will be required to use the freeware version of the email security package, GPG. Instructions on how to use this software that is installed for use in the labs can be obtained from the School Help Desk. However, in order that your GPG key ring can be stored between sessions of use, you will first need an account on either lawson or alacritas.

Should you wish to install GPG on your own computer then this software is available on the 2006 School CD.

Computing Facilities

The School has PC labs (Windows XP), Mac labs (Mac OS-X 10.4), and Networking labs at the Newnham and Sandy Bay campuses. It also maintains 6 Macs (Mac OS-X 10.4) at the NW Centre. Unix accounts can be accessed from all Macs and PCs.
If you have not used these facilities before please contact the School Help Desk to organise your account details. If you would like to access the facilities at the Newnham and Sandy Bay campuses after hours please contact the School Help Desk.

Please contact the School Help Desk if you have difficulty accessing or using these facilities.

**Use of Facilities**

Use of computing facilities provided by the School is subject to the School's Ethics Guidelines - [http://www.comp.utas.edu.au/app/ethics.jsp](http://www.comp.utas.edu.au/app/ethics.jsp). Copies of the guidelines are also available in all School labs. The School's facilities may only be used for study-related purposes, and may not be used for personal gain. The playing of games is strictly prohibited in all labs at all times. Before being granted access to the School's facilities, you will be required to sign a declaration that you have read and understand these guidelines, and that you will abide by them. Disciplinary action may be taken against students who violate the guidelines.

**Occupational Health and Safety**

The university is committed to providing a safe and secure teaching and learning environment. For more information see [http://www.admin.utas.edu.au/hr/ohs/pol_proc/](http://www.admin.utas.edu.au/hr/ohs/pol_proc/)

**ASSESSMENT**

**Assessment Items**

**Item 1**

**Title:** Assignment 1 - Cuckoo's Egg Analysis  
**Type:** In-Semester - individual assignment  
**Weighting:** 10%  
**Due:** 3pm Monday August 14th

This assignment requires you to read the book 'The Cuckoo's Egg'. There may be an opportunity for approved students to undertake an alternative assessment task to replace reading the book.

**Item 2**

**Title:** Assignment 2 - Tender Proposal for a Case Study  
**Type:** In-Semester - group project  
**Weighting:** 20%  
**Due:** 3pm Monday 9th October

This is a large piece of work: a group of 5 will produce around 40 pages of report. Students are advised to work steadily throughout semester on this assignment and not to leave it to the last week or so.

To encourage this approach, there are 6 tutorials devoted to the work required for this assignment during semester.

This assignment may be undertaken as an individual assignment, with permission.

**Item 3**

**Title:** Formal Examination  
**Type:** Formal Examination  
**Weighting:** 70%  
**Due:** University Examination Period

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.

**In-Semester Assessment**

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.

**Plagiarism**

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; or
- 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.utas.edu.au/tl/supporting/academicintegrity/index.html.

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/policy/subject.html#students.

The University reserves the right to submit assignments to plagiarism detection software, and might then retain a copy of the assignment on its database for the purpose of future plagiarism checking.

Referencing

The university document on plagiarism contains information about referencing the work or ideas of others. (See http://www.utas.edu.au/plagiarism/) The preferred text referencing systems for the School is the Harvard system (also referred to as the author-date system).

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 from the School Help Desk in Launceston and Hobart, and on the School’s web site http://www.comp.utas.edu.au/app/studyresources.jsp.

Extensions and Penalties

Assessment items will not be accepted after the due date except under the conditions stated in the school policy on late assessment. http://www.comp.utas.edu.au/app/late_assess.jsp

Formal Examination

The formal examination is conducted by the University Registrar. The 'Current Students' section on the university website contains information about the conduct of, and timetable for, formal examinations.

The School requires that a student enrolled in this unit must attend at least two thirds of the tutorials. Attendance records will be kept by the School, and a student not attending the minimum number of tutorials will be excluded from the examination unless specifically permitted to take the examination by the Head of the School.

Final Grade

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

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 for details of the Faculty Assessment Guidelines.

In order to comply with the benchmarks set by the Faculty of Science, Engineering & Technology both in-semester and examination marks may be scaled either up or down. The benchmarks can be found as part of the Faculty Assessment Guidelines at: http://fcms.its.utas.edu.au/scieng/scieng/policies.asp

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

The maximum mark awarded to a student who fails the unit will be 44.
For more information, including other grades such as Supplementary and Terminating grades, see the School of Computing’s guidelines for assessment - available at: http://www.comp.utas.edu.au/app/assess.jsp