

# Security Engineering - Course Outline

## NWEN 405: 2016 Trimester 2

---

This document sets out the workload and assessment requirements for NWEN 405. It also provides contact information for staff involved in the course. If the contents of this document are altered during the course, you will be advised of the change by an announcement in lectures and/or on the course web site. A printed copy of this document is held in the School Office.

Contents of this document:

- ↓ [Course Organisation](#)
  - ↓ [Staff](#)
  - ↓ [Class/lab Times and Room Numbers](#)
  - ↓ [Trimester Dates and Examination Period Dates](#)
- ↓ [Objectives and Content](#)
  - ↓ [The Course](#)
  - ↓ [Learning Objectives](#)
  - ↓ [Course Content, Delivery and Workload](#)
  - ↓ [Readings](#)
  - ↓ [Materials and Equipment](#)
- ↓ [Assessment](#)
  - ↓ [Method of Assessment](#)
    - ↓ [Quizzes](#)
    - ↓ [Projects](#)
    - ↓ [Final Examination](#)
  - ↓ [Weightings of Each Assessment Task](#)
  - ↓ [Due Dates](#)
  - ↓ [Penalties](#)
  - ↓ [Duration of Examination](#)
  - ↓ [Special Requirements](#)
  - ↓ [Mandatory Requirements](#)
  - ↓ [Passing NWEN 405](#)
- ↓ [Additional Information](#)
  - ↓ [Announcements and Communication](#)
- ↓ [University Requirements and Plagiarism Statement](#)
  - ↓ [Plagiarism](#)
  - ↓ [Withdrawal](#)
  - ↓ [Rules & Policies](#)

## Course Organisation

---

### Staff

---

The course organiser and lecturer for NWEN 405 is [Ian Welch](#). His contact details are:

- [Ian Welch](#)
- [AM 403](#)
- +64 4 463 463
- [ian.welch@ecs.vuw.ac.nz](mailto:ian.welch@ecs.vuw.ac.nz)

The Class Rep for NWEN 405 will be elected during the second week of the course.

### Class/lab Times and Room Numbers

---

Lectures for NWEN 405 are on Tuesdays and Thursday from 1510-1600 at 83 Fairlie Terrace in room 201 (see the [University Timetable](#) for more information).

### Trimester Dates and Examination Period Dates

---

NWEN 405 is a trimester 2 course. The trimester starts on Monday 13th July. The examination period at the end of the course is 21 October - 12 November.

## Objectives and Content

---

### The Course

---

The Internet's role as a large, public, distributed system has raised security to an issue of critical importance. This course examines security mechanisms, security policies, security evaluation and risk management, security issues in networks and operating systems and software security..

### Learning Objectives

---

By the end of the course, students should be able to:

1. Demonstrate their understanding of key security concepts through activities such as writing as reports or solving set problems (BE graduate attributes [2\(b\)](#)) and [3\(f\)](#)).
2. Demonstrate their understanding of key security engineering principles by applying those principles to the analysis of a secure system (BE graduate attributes [2\(b\)](#)), [3\(a\)](#), [3\(c\)](#), [3\(d\)](#)) and [3\(f\)](#)).
3. Demonstrate their understanding of threats to computer systems by being able to carry out the assessment of the security of a networked system (BE graduate attributes [2\(b\)](#)), [3\(a\)](#), [3\(c\)](#), [3\(d\)](#)) and [3\(f\)](#)).

**Note:** NWEN 405 is part of the Engineering program at Victoria University of Wellington. BE students are expected to exhibit a number of graduate attributes upon graduation. These course objectives contribute to the graduate attributes as indicated above. A full table of these attributes is available at [Graduate Attributes](#).

### Course Content, Delivery and Workload

---

A schedule of lecture topics, readings, and assignment due dates is available at the course's blackboard site. Topics will include:

1. Security policies and models
2. Operating system security, application security issues and countermeasures
3. Network security attacks and countermeasures
4. Malware, countermeasures and the crime ecosystem
5. Social engineering, usability and countermeasures

In addition to attending lectures, you should spend about four hours per week doing assigned readings because these will be examinable. These readings can be found in the blackboard site.

In order to maintain satisfactory progress in NWEN 405, you should plan to spend an average of 10 hours per week on this paper. A plausible and approximate breakdown for these hours would be:

- Lectures: 2 hours
- Readings: 4 hours
- Practical work: 4 hours

### Readings

---

This year we have an official textbook. A copy has been made available on short term loan in the library.

| William Stallings and Lawrie Brown. "Computer Security: Principles and Practice (3rd edition, international edition)". Pearson.

### Materials and Equipment

---

All the course handouts will be available on the course web site. Notice that the slides may be incomplete and we expect students to attend lectures and complete them.

The School cannot provide in depth support for working at home but the projects may be done at home as long as you use a compatible version of the JDK and an installation of VirtualBox.

## Assessment

---

### Method of Assessment

---

There will be ten weekly quizzes, two projects and two terms tests.

## Quizzes

We will use frequent quizzes to help your learning. Recent research (see [here](#) or [here](#) for more details) has suggested that repeated "low stakes" quizzes that can help people's learning.

Generally the quizzes will have up to four short questions that generally relate to material taught in the prior week but might also include material from previous tests.

There will be eight quizzes, your grade will be computed on the best four of them.

## Projects

There are two projects. Both require you to assess the vulnerability of computer systems. In both cases these assessments will be carried out on systems under either your or our control so you will not be violating either the University's code of student conduct or the New Zealand Crimes Act.

### Project 1 – eVoting

You are given the task of adding backdoors to an election system written in Java and auditing an already subverted election system to determine its vulnerabilities.

Both parts of the project can be done in pairs or individually.

Assessment is based upon creativity of the backdoor added to the system, how effectively it was at being hidden, quality of process used to locate backdoors and ability to communicate what you have done.

This project can be done by two people working together, in this case you will **share the same grade**.

### Project 2 – Software and network vulnerabilities

You are given some penetration testing style attacks, you will be assessed upon your thoroughness and your writeup.

## Final Examination

There is no final examination.

## Weightings of Each Assessment Task

---

Your grade for NWEN 405 will be determined based on the following assessment weightings:

<u>Item</u>	<u>Weight</u>	<u>Note</u>
Eight in-class quizzes (best four count)	20%	Objective 1
e-Voting project	15%	Objective 1 and 2
Penetration testing lab	25%	Objective 3
2 x Terms tests	40%	Objective 1

**Note:** Bachelor of Engineering students should be aware that copies of their assessed work may be retained for inspection by accreditation panel.

## Due Dates

---

The hand-in dates for the assignments and projects are:

<u>Item</u>	<u>Due date</u>
Terms test	TBA, week 6
eVoting project	End of trimester break
Quizzes	Thursdays, weeks 3-12 except week 6 & 11
Terms test	TBA, week 10
Penetration testing project	Exam break

## Penalties

---

Late project work will be penalised 10%. Work which is more than five days late will not be marked. If you anticipate difficulty in meeting a deadline, please approach the course coordinator as soon as possible so an extension can be agreed upon.

Feedback is given the Monday following a quiz so you cannot take one late unless by prior discussion with the course

coordinator who may arrange for a makeup. This should be for unforeseen circumstances because to get the learning effect of taking quizzes they need to be done on time.

---

## Duration of Examination

---

The final examination will be **three hours long** and is closed book.

---

## Special Requirements

---

This course has no special requirements.

---

## Mandatory Requirements

---

There are no mandatory requirements for this course.

---

## Passing NWEN 405

---

To pass NWEN 405, a student must satisfy mandatory requirements and gain at least a **C-** grade overall.

---

## Additional Information

---

---

### Announcements and Communication

---

The main means of communication outside of lectures will be the NWEN 405 Blackboard site. There you will find the lecture schedule, details of the reading assignments and submission links. The Blackboard course page announcements system will be used instead of the ECS Forum. Questions and comments can be posted to the forum, and staff will read these posts and frequently respond to them.

---

## University Requirements and Plagiarism Statement

---

---

### Plagiarism

---

We encourage you to discuss the principles of the course and assignments with other students, to help and seek help with programming details, problems involving the lab machines. However, any work you hand in must be your own work.

The School policy on Plagiarism (claiming other people's work as your own) is available from the course home page. Please read it. We will penalise anyone we find plagiarising, whether from students currently doing the course, or from other sources. Students who knowingly allow other students to copy their work may also be penalised. If you have had help from someone else (other than a tutor), it is always safe to state the help that you got. For example, if you had help from someone else in writing a component of your code, it is not plagiarism as long as you state (eg, as a comment in the code) who helped you in writing the method.

We will be using Turnitin in this course to check the reports for plagiarism.

---

### Withdrawal

---

The last date for withdrawal from NWEN 405 with entitlement to a refund of tuition fees is Friday 22 July 2016. The last date for withdrawal without being regarded as having failed the course is Friday 23 September 2016 -- though later withdrawals may be approved by the Dean in special circumstances.

---

### Rules & Policies

---

Find key dates, explanations of grades and other useful information at <http://www.victoria.ac.nz/home/study>.

Find out about academic progress and restricted enrolment at <http://www.victoria.ac.nz/home/study/academic-progress>.

The University's statutes and policies are available at <http://www.victoria.ac.nz/home/about/policy>, except qualification statutes, which are available via the Calendar webpage at <http://www.victoria.ac.nz/home/study/calendar> (See Section C).

Further information about the University's academic processes can be found on the website of the Assistant Vice-Chancellor (Academic) at <http://www.victoria.ac.nz/home/about/avcacademic>

All students are expected to be familiar with the following regulations and policies, which are available from the school web site:

Grievances

Student and Staff Conduct

Meeting the Needs of Students with Disabilities

Student Support

Academic Integrity and Plagiarism

Dates and Deadlines including Withdrawal dates

School Laboratory Hours and Rules

Printing Allocations

Expectations of Students in ECS courses

The School of Engineering and Computer Science strives to anticipate all problems associated with its courses, laboratories and equipment. We hope you will find that your courses meet your expectations of a quality learning experience.

If you think we have overlooked something or would like to make a suggestion feel free to talk to your course organiser or lecturer.

[Course Outline as PDF](#)

---