COMP2320
Offensive Security
Session 2, Special circumstances 2021
Department of Computing

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Notice
Some on-campus classes have moved online for the first two weeks of Session, before returning to campus in Week 3. If you are studying a unit outside of the primary Session 2 timetable, please contact your teaching staff team for further details.

Some classes/teaching activities cannot be moved online and must be taught on campus. To find out if you are enrolled in one of these classes/teaching activities, you can check to see if your unit is on the list of units with mandatory on-campus classes/teaching activities.

Your Unit Convenor will provide more information via an iLearn announcement when your iLearn unit becomes available.
General Information

Unit convenor and teaching staff
Alireza Jolfaei
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Credit points
10

Prerequisites

Corequisites
(COMP2110 or COMP249) and (COMP2250 or COMP247) and (COMP2300 or COMP343)

Co-badged status
COMP6320

Unit description
This unit provides an introduction to ethical hacking and offensive security. Strong emphasis is given to ethics and ethical behaviour as students are exposed to penetration techniques and methods. In other words, students are taught how to systematically look for and exploit vulnerabilities in software, protocols and systems in order to report those vulnerabilities and improve the safety of those software, protocols and systems. Communication, in speaking and writing plays a critical role in this unit. The most proficient students in this unit may be selected to represent the University at various national pentesting competitions and challenges.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates

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

ULO1: Explain the importance of ethics and ethical behaviour in relation to offensive security and penetration testing.

ULO2: Perform scoping, vulnerability scanning and reconnaissance on a range of devices, platforms, protocols, systems and organisations.

ULO3: Exploit vulnerabilities for a range of purposes, including access control, payload
delivery and privilege escalation.

ULO4: Effectively communicate results verbally and in-writing to technical and non-technical audiences.

General Assessment Information

LATE SUBMISSION

No extensions will be granted without an approved application for Special Consideration. There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late. For example, 25 hours late in submission of a report worth 2 marks – 20% penalty or 0.4 marks deducted from the total.

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTF #1</td>
<td>24%</td>
<td>No</td>
<td>Week 5</td>
</tr>
<tr>
<td>CTF #2</td>
<td>24%</td>
<td>No</td>
<td>Week 9</td>
</tr>
<tr>
<td>CTF #3</td>
<td>24%</td>
<td>No</td>
<td>Week 13</td>
</tr>
<tr>
<td>In-class exercises</td>
<td>18%</td>
<td>No</td>
<td>Weekly</td>
</tr>
<tr>
<td>Research and Presentation</td>
<td>10%</td>
<td>No</td>
<td>Weeks 12 (Report and Slides). Week 13 (Presentation)</td>
</tr>
</tbody>
</table>

CTF #1

Assessment Type: Project
Indicative Time on Task: 12 hours
Due: Week 5
Weighting: 24%

This capture-the-flag exercise will be completed during scheduled class time. Teams will compete against each other and students will be assessed individually via a report to be submitted one week after the CTF.

On successful completion you will be able to:

• Perform scoping, vulnerability scanning and reconnaissance on a range of devices, platforms, protocols, systems and organisations.
• Exploit vulnerabilities for a range of purposes, including access control, payload delivery...
and privilege escalation.

• Effectively communicate results verbally and in-writing to technical and non-technical audiences.

CTF #2
Assessment Type: Project
Indicative Time on Task: 12 hours
Due: Week 9
Weighting: 24%

This capture-the-flag exercise will be completed during scheduled class time. Teams will compete against each other and students will be assessed individually via a report to be submitted one week after the CTF.

On successful completion you will be able to:

• Perform scoping, vulnerability scanning and reconnaissance on a range of devices, platforms, protocols, systems and organisations.
• Exploit vulnerabilities for a range of purposes, including access control, payload delivery and privilege escalation.
• Effectively communicate results verbally and in-writing to technical and non-technical audiences.

CTF #3
Assessment Type: Project
Indicative Time on Task: 12 hours
Due: Week 13
Weighting: 24%

This capture-the-flag exercise will be completed during scheduled class time. Teams will compete against each other and students will be assessed individually via a report to be submitted one week after the CTF.

On successful completion you will be able to:

• Perform scoping, vulnerability scanning and reconnaissance on a range of devices, platforms, protocols, systems and organisations.
• Exploit vulnerabilities for a range of purposes, including access control, payload delivery and privilege escalation.
• Effectively communicate results verbally and in-writing to technical and non-technical audiences.

In-class exercises
Assessment Type 1: Quiz/Test
Indicative Time on Task 2: 9 hours
Due: Weekly
Weighting: 18%

During workshops, you will be set an in-class exercise related to that week’s lecture topic to complete during the class. Your work will be checked and marked in the workshop class in which it is completed. No late submissions are accepted.

On successful completion you will be able to:
• Explain the importance of ethics and ethical behaviour in relation to offensive security and penetration testing.
• Perform scoping, vulnerability scanning and reconnaissance on a range of devices, platforms, protocols, systems and organisations.
• Exploit vulnerabilities for a range of purposes, including access control, payload delivery and privilege escalation.

Research and Presentation
Assessment Type 1: Presentation
Indicative Time on Task 2: 5 hours
Due: Weeks 12 (Report and Slides). Week 13 (Presentation)
Weighting: 10%

Student groups will research a well known vulnerability (chosen by the teaching staff) and provide a presentation and demonstration of the vulnerability. Each presentation will be followed by a brief question-and-answer session. Group members will submit a report individually with a focus on the ethical implications of the use and misuse of the vulnerability.

On successful completion you will be able to:
• Explain the importance of ethics and ethical behaviour in relation to offensive security
and penetration testing.

- Effectively communicate results verbally and in-writing to technical and non-technical audiences.

1 If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Learning Skills Unit for academic skills support.

2 Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

COMPUTING FACILITIES

COMP2320 is a BYOD (Bring Your Own Device). You will be expected to bring your own laptop computer (Windows, Mac, or Linux) to the workshop, install and configure the required software, and incorporate secure practices into your daily work (and play!) routines.

CLASSES

Each week you should complete any assigned readings and review the lecture slides in order to prepare for the lecture. There are two hours of lectures and a two-hour workshop every week. The hands-on exercises in workshops help to reinforce concepts introduced during the lectures. You should have chosen a practical on enrollment. You will find it helpful to read the workshop instructions before attending - that way, you can get to work quickly! For details of days, times, and rooms consult the timetables webpage. Note that Workshops commence in week 1. Please note that you will be required to submit work every week.

RECOMMENDED TEXTS

The following two textbooks contain the bulk of the weekly readings.

1. Penetration Testing: A Hands-On Introduction to Hacking, by Georgia Weidman (available online from the library).
4. Business Data Communications and Networking, 13th Edition, by FitzGerald, Dennis, and Durcikova (available online from the library).

WEB RESOURCES

https://unitguides.mq.edu.au/unit_offerings/133726/unit_guide/print
COMP2320 is administered via iLearn (http://ilearn.mq.edu.au/).

Digital recordings of lectures may be available. When available they will be linked from iLearn.

DISCUSSION BOARDS

This unit makes use of discussion boards hosted within iLearn. Please post questions there; they are monitored by the staff on the unit.

GENERAL NOTES

In this unit, you should do the following:

- Attend lectures, take notes, ask questions.
- Attend your weekly practical session.
- Ensure that you participate in the CTF exercises.
- Read appropriate sections of the text, add to your notes, and prepare questions for your lecturer/tutor.
- Work on any assignments that have been released.

Lecture notes will be made available each week but these notes are intended as an outline of the lecture only and are not a substitute for your own notes or the recommended reading list.

Unit Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Module</th>
<th>Lecture Topics</th>
<th>Assessment</th>
<th>Weight</th>
<th>Submit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Systems</td>
<td>Introduction, ethics, group selection, Virtual machines, Kali Linux, Windows, file systems, process models, vulnerabilities</td>
<td>In-class exercise, Diagnostic Test</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>In-class exercise</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>In-class exercise</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>Capture The Flag (CTF) #1</td>
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</tr>
<tr>
<td>5</td>
<td>Web</td>
<td>Web infrastructure, injections, cross-site scripting, cookies, headers, fuzzing, vulnerabilities</td>
<td>In-class exercise</td>
<td>2%</td>
<td>CTF #1 Report</td>
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<tr>
<td>6</td>
<td></td>
<td></td>
<td>In-class exercise</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Activity</td>
<td>Description</td>
<td>Weight</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>In-class exercise</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mid Semester Break - Recess</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Capture The Flag (CTF) #2</td>
<td>24%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Networking</td>
<td>Network stack, scanning, services, authentication protocols, services, vulnerabilities</td>
<td>In-class exercise 2% CTF #2 Report</td>
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<td></td>
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<tr>
<td>10</td>
<td>In-class exercise</td>
<td>2%</td>
<td></td>
<td></td>
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<tr>
<td>11</td>
<td>In-class exercise</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Capture The Flag (CTF) #3</td>
<td>24% Presentation Slides</td>
<td></td>
<td></td>
<td></td>
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<td>13</td>
<td>Presentations</td>
<td>Group presentations</td>
<td>10% CTF #3 Report</td>
<td></td>
<td></td>
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</table>

### Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
• Complaint Management Procedure for Students and Members of the Public
• Special Consideration Policy *(Note: The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

**Student Code of Conduct**

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

**Results**

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

**Student Support**

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

**Learning Skills**

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

**Student Enquiry Service**

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au
Equity Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.