COMP7260

Network and Systems Security

Session 2, Special circumstance 2020

Department of Computing

Contents

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Notice

As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and ot her small group learning activities on campus for the second half-year, while keeping an online ver sion available for those students unable to return or those who choose to continue their studies onli ne.

To check the availability of face-to-face and onlin e activities for your unit, please go to timetable vi ewer. To check detailed information on unit asses sments visit your unit's iLearn space or consult yo ur unit convenor.

General Information

Unit convenor and teaching staff Milton Baar milton.baar@mq.edu.au
Credit points 10
Prerequisites Admission to MRes
Corequisites
Co-badged status
Unit description As organisations and users increasingly rely upon networked applications for assessing information and making critical business decisions, securing distributed applications is becoming extremely significant. The unit is concerned with the protection of information in computing systems and networks. It will address concepts and techniques for securing distributed applications.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

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

ULO1: Analyse key security requirements and trends in a distributed networked computing environment

ULO2: Develop and/or advance skills of research and critical analysis in a manner consistent with the completion of a postgraduate degree.

ULO3: Evaluate authentication and access control security functionalities in distributed systems and networks

ULO4: Apply security techniques and mechanisms to develop security protocols

ULO5: Analyse the security threats and develop security architecture and functionalities to counteract the security threats

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 for an assignment worth 10 marks – 20% penalty or 2 marks deducted from the total. No submission will be accepted after solutions have been posted.

Supplementary Exam

If you receive Special Consideration for a module exam, a supplementary exam will be scheduled after the normal exam period. By making a special consideration application for the module exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification prior to the exam with the exact date and time of their supplementary examination.

Assessment Tasks

Name	Weighting	Hurdle	Due
Quiz 1: Week 4	10%	No	Week 6
Online Exam (Week 13)	40%	No	Semester 2 exam period
Assignment 1	20%	No	Week 7
Quiz 2: Week 9	10%	No	Week 11
Assignment 2: Individual Report	20%	No	Week 12

Quiz 1: Week 4

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 10 hours
Due: **Week 6**
Weighting: **10%**

Quiz 1 is a short in class test (close book) that will be based on your previously covered lecture material for weeks 1-3.

On successful completion you will be able to:

- Analyse key security requirements and trends in a distributed networked computing environment
- Evaluate authentication and access control security functionalities in distributed systems and networks
- Apply security techniques and mechanisms to develop security protocols

Online Exam (Week 13)

Assessment Type [1]: Examination
Indicative Time on Task [2]: 25 hours
Due: **Semester 2 exam period**
Weighting: **40%**

The final examination in this unit is a **hurdle** requirement; you must get a mark of at least 40% in the examination to pass the unit. If you get a mark between 30% and 40% in your first attempt, you will be given a second and final attempt.

On successful completion you will be able to:

- Analyse key security requirements and trends in a distributed networked computing environment
- Develop and/or advance skills of research and critical analysis in a manner consistent with the completion of a postgraduate degree.
- Evaluate authentication and access control security functionalities in distributed systems and networks
- Apply security techniques and mechanisms to develop security protocols
- Analyse the security threats and develop security architecture and functionalities to counteract the security threats

Assignment 1

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 15 hours
Due: **Week 7**
Weighting: **20%**

Assignment on Security Mechanisms and Protocols

On successful completion you will be able to:

- Analyse key security requirements and trends in a distributed networked computing environment
- Apply security techniques and mechanisms to develop security protocols
- Analyse the security threats and develop security architecture and functionalities to counteract the security threats

Quiz 2: Week 9

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 10 hours
Due: **Week 11**
Weighting: **10%**

Quiz 2 is a short in class test (close book) that will be based on your previously covered lecture material for Weeks 4-8.

On successful completion you will be able to:

- Analyse key security requirements and trends in a distributed networked computing environment
- Evaluate authentication and access control security functionalities in distributed systems and networks

Assignment 2: Individual Report

Assessment Type [1]: Practice-based task
Indicative Time on Task [2]: 15 hours
Due: **Week 12**
Weighting: **20%**

This assessment task is based on latest proposals (academic and industrial) for secure systems. A list of these systems (e.g., relevant academic papers, white papers) will be available to the students by week 2 of the semester. By week 5, the students choose their topic. The assessment task is to provide a report on security analysis of, and security recommendations for, the chosen system.

On successful completion you will be able to:

- Analyse key security requirements and trends in a distributed networked computing environment
- Develop and/or advance skills of research and critical analysis in a manner consistent with the completion of a postgraduate degree.
- Apply security techniques and mechanisms to develop security protocols
- Analyse the security threats and develop security architecture and functionalities to counteract the security threats

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[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 Writing Centre 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

Important! Please note that this is a BYOD (Bring Your Own Device) unit. You will be expected to bring your own laptop computer (Windows, Mac or Linux), install and configure the required software.

CLASSES

Each week you should complete any assigned readings and review the lecture slides in order to prepare for the lecture. There are three hours of lectures every week. The lectures will be pre-recorded and available online. You are at the very least expected to go through the lecture slides and videos during the first two hours of the time slot for the lecture, i.e., Fridays 11:00AM to 1:00 pm. There will be a live Q&A session every week during the third hour of time slot for the lecture, i.e., Fridays 1:00 to 2:00 pm. During the live Q&A session, you can ask questions related to the lectures, hands on, and take home exercises.

For details of days, times and rooms consult the timetables webpage.

Take home exercises will commence **in week 1**.

Please note that you will be **required** to submit work every week. Failure to do so may result in you failing the unit or being excluded from the exams.

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.

REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

This material for this unit is in part based on the following textbooks:

- William Stallings, Cryptography and Network Security: Principles and Practices, Prentice Hall (4th Edition) · Charles Pfleeger, Security in Computing, Prentice Hall, 20026 (4th Edition)

- Charlie Kaufman, Radia Perlman and Mike Speciner, Network Security: Private Communication in a Public World, Prentice Hall

- Dieter Gollman, Computer Security, John Wiley

- Simson Garfinkel and Gene Spafford, Practical Unix Security, O'Reilly & Associates, Inc.

- Trusted Computing Platforms: TCPA Technology in Context, Ed: Siani Pearson, Prentice Hall, 2003

- Ross Anderson, Security Engineering, John Wiley, 1st or 2nd Edition

TECHNOLOGY USED AND REQUIRED

iLearn

iLearn is a Learning Management System that gives you access to lecture slides, lecture recordings, forums, assessment tasks, instructions for practicals, discussion forums and other resources.

Echo 360 (formerly known as iLecture)

Digital recordings of lectures are available. Read these instructions for details.

Technology Used

PacketTracer, Anaconda, Jupyter Notebook with Python.

Unit Schedule

Week	Topic	Reading
1	Introduction: Cyber Security Trends and Concepts	Lecture Slides
3	Threat Models and Security Goals	Lecture Slides
2	Cryptography, Cryptographic and Security Protocols	Lecture Slides
4	Authentication and Access Control	Lecture Slides
5	Web Security	Lecture Slides

6	Internet Security Protocol	Lecture Slides
7	Distributed Systems Security: BGP Security	Lecture Slides
8	Cloud Computing Security	Lecture Slides
9	Distributed Denial of Service Attacks and Defences	Lecture Slides
10	Mobile Platform Security Architecture	Lecture Slides
11	Anonymity and Censorship Techniques	Lecture Slides
12	Group Project Presentations	Lecture Slides
13	Revision	Lecture Slides

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/study/getting-started/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 Services and 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.

Student Enquiries

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

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.

Grading Standards

At the end of the semester, you will receive a grade that reflects your achievement in the unit

- **Fail (F)**: does not provide evidence of attainment of all learning outcomes. There is missing or partial or superficial or faulty understanding and application of the

fundamental concepts in the field of study; and incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.

- **Pass (P)**: provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; and communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.

- **Credit (Cr)**: provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; plus communication of ideas fluently and clearly in terms of the conventions of the discipline.

- **Distinction (D)**: provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.

- **High Distinction (HD)**: provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application.

Your final grade depends on your performance in each assessment task and on your ability to perform well enough on the hurdle assessment tasks.

For each task, you receive a mark that reflects your standard of performance. Then the different component marks are added up to determine an aggregated mark out of 100. In order to pass the unit, this aggregated mark needs to be at least 50.

Note that none of the assessment tasks in this unit are a hurdle requirement. However, if you do not make a reasonable attempt at the assessments, you will be unlikely to pass the unit.

Your final grade is then a direct reflection of the aggregated mark (provided that you satisfy the hurdle requirements) according to the following:

- 85-100 for **HD**

- 75-84 for **D**

- 65-74 for **CR**

- 50-64 for **P**

If you receive special consideration for the module exams, a supplementary exam will be scheduled in the week of the regular exam offering. By making a special consideration application for the module exams you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. You can check the supplementary exam information page on this course' iLearn page for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

If you are given a second opportunity to sit the final examination as a result of failing to meet the minimum mark required, you will be offered that chance during the same supplementary examination period and will be notified of the exact day and time after the publication of final results for the unit.