



# COMP8320

## Information and Data Security

Session 2, Special circumstance 2020

*Department of Computing*

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#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

#### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Convenor and Lecturer

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Lecturer

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Credit points

10

Prerequisites

(COMP6300 or ITEC643) or admission to MInfoTechCyberSec or  
BCyberSecMInfoTechCyberSec

Corequisites

Co-badged status

Unit description

This unit deals with the concepts, techniques and tools which contribute to enable information and data security. Building on applied cryptography notions and introducing the concept of provable privacy, the unit addresses topics such as encryption, privacy preserving techniques in data mining, content security solutions or secure data management.

## 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:** Explain the concepts of information security and provable privacy.

**ULO2:** Perform risk assessment (including privacy risk) on digital information and datasets.

**ULO3:** Apply adapted security technologies and tools, in particular encryption to

enhance security properties of data.

**ULO4:** Analyse the trends for managing data security.

## 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
<a href="#">Module Exam 2</a>	20%	No	Week 9
<a href="#">Module Exam 1</a>	20%	No	Week 5
<a href="#">Assignment 2</a>	15%	No	Week 7
<a href="#">Module Exam 3</a>	20%	No	Week 13
<a href="#">Assignment 2</a>	15%	No	Week 12
<a href="#">Weekly Tasks</a>	10%	No	Every Week

### Module Exam 2

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 15 hours

Due: **Week 9**

Weighting: **20%**

A 50 minutes long online examination worth 20% that will be held in week 9 (online via iLearn).

This will test understanding of material covered in weeks 5 to 8. For on campus offering this will be held during practical classes.

On successful completion you will be able to:

- Perform risk assessment (including privacy risk) on digital information and datasets.
- Apply adapted security technologies and tools, in particular encryption to enhance security properties of data.

## Module Exam 1

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 15 hours

Due: **Week 5**

Weighting: **20%**

A 50 minutes long online examination worth 20% that will be held in week 5 (online via iLearn). This will test understanding of material covered in weeks 1 to 4. For on campus offering this will be held during practical classes.

On successful completion you will be able to:

- Explain the concepts of information security and provable privacy.
- Perform risk assessment (including privacy risk) on digital information and datasets.

## Assignment 2

Assessment Type <sup>1</sup>: Project

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Week 7**

Weighting: **15%**

This assignment deals with concepts in provable privacy and risk assessments of datasets and is due on week 7. The assignment is to be submitted via iLearn.

On successful completion you will be able to:

- Explain the concepts of information security and provable privacy.

- Perform risk assessment (including privacy risk) on digital information and datasets.

## Module Exam 3

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 15 hours

Due: **Week 13**

Weighting: **20%**

A 50 minutes long online examination worth 20% that will be held in week 13 (online via iLearn). This will test understanding of material covered in weeks 9 to 12. For on campus offering this will be held during practical classes.

On successful completion you will be able to:

- Perform risk assessment (including privacy risk) on digital information and datasets.
- Apply adapted security technologies and tools, in particular encryption to enhance security properties of data.
- Analyse the trends for managing data security.

## Assignment 2

Assessment Type <sup>1</sup>: Project

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Week 12**

Weighting: **15%**

This assignment deals with identifying privacy risks in datasets and securing access to data and is due on week 12. The assignment is to be submitted via iLearn.

On successful completion you will be able to:

- Explain the concepts of information security and provable privacy.
- Perform risk assessment (including privacy risk) on digital information and datasets.
- Apply adapted security technologies and tools, in particular encryption to enhance security properties of data.
- Analyse the trends for managing data security.

## Weekly Tasks

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Every Week**

Weighting: **10%**

Each week, a set of exercises will be available online. One or two questions from the exercises will be the weekly quiz task.

On successful completion you will be able to:

- Explain the concepts of information security and provable privacy.
- Perform risk assessment (including privacy risk) on digital information and datasets.
- Apply adapted security technologies and tools, in particular encryption to enhance security properties of data.
- Analyse the trends for managing data security.

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<sup>1</sup> 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.

<sup>2</sup> 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 time slot for the lecture, i.e., Tuesdays 1:00 to 3:00 pm. There will be a live Q&A session every week during the second time slot for the lecture, i.e., Thursdays 12:00 to 1:00 pm. During the live Q&A session, you can ask questions related to the lectures 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:

- Dwork, C. and Roth, A., 2014. The algorithmic foundations of differential privacy. *Foundations and Trends in Theoretical Computer Science*, 9(3-4), pp.211-407. Available online: <https://www.cis.upenn.edu/~aaroht/Papers/privacybook.pdf>
- Yi, X., Paulet, R. and Bertino, E., 2014. *Homomorphic encryption and applications* (Vol. 3). Heidelberg: Springer. Available online: <https://link.springer.com/content/pdf/10.1007%2F978-3-319-12229-8.pdf>

## 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

Anaconda, Jupyter Notebook with Python.

## Unit Schedule

Week	Topic	Reading
1	Introduction: Mathematical Background, Data Sharing, and Privacy Risks	Lecture Slides
2	De-identification and Privacy Attacks	Lecture Slides
3	Towards Provable Privacy: K-Anonymity and Related Definitions	Lecture Slides
4	Differential Privacy and its Applications	Lecture Slides
5	Cryptography Primer and Homomorphic Encryption	Lecture Slides

6	Mobile Privacy and Attacks	Lecture Slides
7	Privacy Protection for Mobile Apps	Lecture Slides
8	Web Privacy	Lecture Slides
9	Web Behaviour Re-identification and Defence	Lecture Slides
10	Online Tracking and Fingerprinting	Lecture Slides
11	Blacklists-based Tracking Prevention	Lecture Slides
12	Machine Learning for Privacy Protection	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) (<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) (<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) (<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](mailto: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](http://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](mailto: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/](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 FSE101 in iLearn ([bit.ly/FSESupp](https://bit.ly/FSESupp)) 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.