COMP3100

Distributed Systems

Session 1, Special circumstances 2021

School of Computing

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Disclaimer

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Notice

As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face 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
Young Lee
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James Zheng
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Credit points
10

Prerequisites
130cp at 1000 level or above including (COMP2100 or COMP202) and (COMP2250 or COMP247)

Corequisites

Co-badged status
COMP6105

Unit description
A distributed system traditionally refers to a group of networked computers; however, it should be today understood in a much wider sense including applications consisting of multiple processes. This unit studies the fundamentals of distributed systems from both hardware perspective and software perspective. The unit also gives some hands-on experience. Topics include distributed systems principles (concurrecy and scheduling), paradigms (cloud computing, mobile computing and Internet of Things), architectures (client-server model, peer-to-peer model and distributed file systems) and techniques (shared memory and message-passing).

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: Describe the complexities of distributed system development and approaches to solve those complexities.

ULO2: Apply theoretical principles and models to design distributed systems.

ULO3: Explain important issues in modern distributed systems.

ULO4: Identify applicability of technologies that support distributed applications.

ULO5: Analyze and design distributed systems.

General Assessment Information

Special Consideration

If you experience serious and unavoidable difficulties that affect your ability to meet the due dates for progress or the closing date of a programming task, you may apply for special consideration as explained at https://students.mq.edu.au/study/my-study-program/special-consideration. If the request is accepted, the action may be to grant an extension of the relevant due date(s), or it may be to require you to submit an alternative assessment item.

If you apply for special consideration, please note:

- Apply promptly. Late applications may make it impossible to sensibly offer an extension, and you may risk having to complete a different assessment task which would mean starting from scratch. For example, if you are ill for two days just before the due date, an extension of two days would be reasonable, but that extension cannot be granted more than two days after the due date since the extension end date would have already passed!
- Email the convenor and unit lecturer to let us know what is happening. This will make it easier for us to respond in a timely manner.
    - During weeks 1-6, email james.zheng@mq.edu.au and also the convenor young.lee@mq.edu.au
    - During weeks 7-13, email young.lee@mq.edu.au

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.

Assessment Tasks

Name	Weighting	Hurdle	Due
Quizzes	10%	No	Weekly
Practical tasks	20%	Yes	Weekly
Major Assignment	40%	No	Weeks 7 and 12

Name	Weighting	Hurdle	Due
Final Exam	30%	No	Exam period

Quizzes

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

Quizzes assess students' knowledge and understanding on distributed systems fundamentals including architectures, paradigms, principles and models of distributed systems.

On successful completion you will be able to:

- Describe the complexities of distributed system development and approaches to solve those complexities.
- Explain important issues in modern distributed systems.
- Identify applicability of technologies that support distributed applications.

Practical tasks

Assessment Type [1]: Participatory task
Indicative Time on Task [2]: 20 hours
Due: **Weekly**
Weighting: **20%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

Practical tasks help guide students to learn practical skills on distributed systems. In particular, they consist of preparatory steps and milestones for the project.

The practical tasks are a **hurdle** in this unit. You must achieve at least 8 marks out of 20 in order to pass the unit.

On successful completion you will be able to:

- Describe the complexities of distributed system development and approaches to solve those complexities.
- Apply theoretical principles and models to design distributed systems.

- Identify applicability of technologies that support distributed applications.
- Analyze and design distributed systems.

Major Assignment

Assessment Type [1]: Programming Task
Indicative Time on Task [2]: 40 hours
Due: **Weeks 7 and 12**
Weighting: **40%**

A distributed system development task that requires composition to design and implement a realistic distributed system

On successful completion you will be able to:

- Apply theoretical principles and models to design distributed systems.
- Identify applicability of technologies that support distributed applications.
- Analyze and design distributed systems.

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 30 hours
Due: **Exam period**
Weighting: **30%**

The final examination will assess your understanding of the unit content and your ability to integrate concepts learned throughout the unit to solve problems.

On successful completion you will be able to:

- Describe the complexities of distributed system development and approaches to solve those complexities.
- Apply theoretical principles and models to design distributed systems.
- Explain important issues in modern distributed systems.
- Identify applicability of technologies that support distributed applications.

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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

Text Books

1. "Distributed Systems: Principles and Paradigms" by Maarten van Steen and Andrew Tanenbaum, 3rd (3.01) edition.
2. "Distributed Systems: Concepts and Design" by George Coulouris, Jean Dollimore, and Tim Kindberg, Addison Wesley, 5th edition.
3. "Distributed and Cloud Computing: From Parallel Processing to the Internet of Things" by Geoffrey C. Fox, Jack Dongarra, and Kai Hwang, 1st edition.

Soft copy of the first two books is "freely" available online.

iLearn Unit Home Page

COMP3100 will make extensive use of the iLearn course management system, including for delivery of class materials, discussion boards, submission of work and access to marks and feedback. Students should check the iLearn site (https://ilearn.mq.edu.au) regularly for unit updates.

Questions and general queries regarding the content of this unit, its lectures or practical classes, or its assessments should be posted to the discussion boards on the COMP3100 iLearn site. In particular, any questions which are of interest to all students in this unit should be posted to one of these discussion boards, so that everyone can benefit from the answers. Questions of a private nature should be directed to the unit teaching staff.

Lectures

Lectures are a core learning experience where we will discuss the theoretical underpinnings and concepts that are essential to this unit. Key ideas for the group project will be discussed from time to time in lectures. Attendance at lectures is highly recommended. Lecture recordings will be available in echo360 accessible from the unit iLearn site.

Workshops (Practicals)

Practical classes commence in Week 2. Each week has two hours of practical class. Each week you should actively participate in practical class and complete tasks associated with the class. You should attend your enrolled practical class. Practical classes also provide an opportunity to (collaboratively) work on the (group) project. The practical assessment item is a **hurdle** in this unit. You must achieve at least 8 marks out of 20, and a total of at least 50 overall marks, in order to pass the unit.

Unit Schedule

The detailed unit schedule will be available on iLearn. The unit is organised into two 6-week periods, with topics approximately as follows.

Week 1-6: Foundational topics of distributed systems, such as system models, communications, synchronisation and fault tolerance.

Weeks 7-12: Real-world and emerging distributed systems, such as cloud data centres, Internet of Things (IoT) and edge computing.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). 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

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

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

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 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.

Changes from Previous Offering

Assessment values have been changed, reducing the value of the final examination to 30%, and making 20% marks for workshop/practical participation. Weekly quizzes replace mid-semester and end-semester tests. Practical tasks have been made a hurdle.