Unit Outline

COMP3008 Distributed Computing

Semester 1, 2021

Unit study package code:	COMP3008
Mode of study:	Internal
Tuition pattern summary:	Note: For any specific variations to this tuition pattern and for precise information refer to the Learning Activities section. Lecture: 1 x 2 Hours Weekly Computer Laboratory: 1 x 1 Hours Weekly This unit does not have a fieldwork component.
Credit Value:	25.0
Pre-requisite units:	ISYS1001 (v.0) Database Systems or any previous version *AND* COMP2003 (v.0) Object Oriented Software Engineering or any previous version
Co-requisite units:	Nil
Anti-requisite units:	Nil
Result type:	Grade/Mark
Approved incidental fees:	Information about approved incidental fees can be obtained from our website. Visit fees.curtin.edu.au/incidental_fees.cfm for details.

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Learning Management System: Blackboard (lms.curtin.edu.au)

Acknowledgement of Country

We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present. The Centre for Aboriginal Studies aspires to contribute to positive social change for Indigenous Australians through higher education and research.

Syllabus

This unit introduces students to Distributed Computing and its associated complexities. Topics covered include remote procedure calls and asynchronous calls, Multi-tiered architectures for distributed computing and XML serialisation and passing objects by value over the network. In addition the unit covers Serverside Web scripting with CGI based approaches. Further topics include Service orientated architectures, Web services as a SOA Framework and modern internet applications with Ajax and Web services.

Introduction

Distributed Computing takes a look at the techniques, systems, and difficulties of distributing computation over a network. We'll be looking at the history of DC, how to do RPC, how to serialize and send data over a network, Web services using a RESTful framework, and modern distributed system architectures in an increasingly distributed compute environment (including Blockchain).

The unit relies heavily on C# and Windows .NET MVC web services, so students are encouraged to familiarize themselves with Microsoft Windows and Visual Studio Community Edition.

Unit Learning Outcomes

All graduates of Curtin University achieve a set of six Graduate Capabilities during their course of study. These inform an employer that, through your studies, you have acquired discipline knowledge and a range of other skills and capabilities which employers would value in a professional setting. Each unit in your course addresses the Graduate Capabilities through a clearly identified set of learning outcomes. They form a vital part in the process referred to as assurance of learning. The learning outcomes notify you of what you are expected to know, understand or be able to do in order to be successful in this unit. Each assessment for this unit is carefully designed to test your knowledge of one or more of the unit learning outcomes. On successfully completing all of the assessments you will have achieved all of these learning outcomes.

Your course has been designed so that on graduating you will have achieved all of Curtin's Graduate Capabilities through the assurance of learning processes in each unit.

	On successful completion of this unit students can:	Graduate Capabilities addressed
1	Describe the attributes of components, the structure of a remote procedure call and the use of interfaces	
2	Design and construct a multi-tiered distributed system and reflect on the progress of learning new languages and paradigms	
3	Critically analyse design decisions and report outcomes in a format appropriate for a professional audience	
4	Justify the use of service orientated architectures for the internet	
5	Describe and consider the necessity of security in a distributed environment	

Curtin's Graduate Capabilities

	Apply discipline knowledge, principles and concepts		Innovative, creative and entrepreneurial		Effective communicators with digital competency
	Globally engaged and responsive		Culturally competent to engage respectfully with local First Peoples and other diverse cultures		Industry connected and career capable

Find out more about Curtin's Graduate Capabilities at the Curtin Learning and Teaching website: clt.curtin.edu.au

Learning Activities

In DC, the course work is split into Theoretical and Practical concepts. Theoretical concepts are taught in the lectures, where the general ideas of distributed computing will be discussed in an open forum with students. Practical concepts are taught in the tutorials, which allow students to explore the problems and solutions available in the distributed computing space in an interactive manner with their tutor.

Tutorial sessions may not have the sufficient time to complete all practical content, so students are encouraged to attempt practicals prior to the tutorial time and come to the tutorial with questions for their tutor. This allows tutorials to be focused on the areas that students are least sure of.

Reading the lecture slides alone will not be sufficient to obtain a passing mark for the unit.

Assessment

Assessment policy exemptions

- There are no exemptions to the assessment policy

Assessment schedule

	Task	Value %	Date Due	Unit Learning Outcome(s) Assessed	Late Assessments Accepted?*	Assessment Extensions Considered?*
1	Assignment 1 - NET Remoting and ASP NET Web API	30%	**Week:** 7 **Day:** TBD **Time:** TBD	1,2,3	Yes	Yes
2	Assignment 2 - NET and Blockchain	30%	**Week:** 12 **Day:** TBD **Time:** TBD	2,3,4,5	Yes	Yes
3	Test	40%	**Week:** Examination Period **Day:** TBD **Time:** TBD	1,2,4	No	No

*Please refer to the Late Assessment and the Assessment Extension sections below for specific details and conditions.

Detailed information on assessment tasks

1. It is a programming assignment where the students will build a distributed Website using .NET Remoting and ASP.NET Web API's.
2. It is a programming assignment where the students will build a secured distributed application using .NET and blockchain.
3. Final Exam

Pass requirements

In order to pass, students must:

1. Submit assigment 1
2. Submit assigment 2
3. Have achieved a mark of 45% or greater in the final exam
4. Have achieved a mark of at least 50% overall

Assessment Moderation

Fair assessment through moderation

Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that students work is evaluated consistently by assessors. Minimum standards for the moderation of assessments are described in the Assessment and Student Progression Manual, available from policies.curtin.edu.au/findapolicy/

Pre-marking moderation

This unit complies with moderation of assessments as described in the Assessment and Student Progression Manual

Intra-marking / Post-marking moderation

This unit complies with moderation of assessments as described in the Assessment and Student Progression Manual

Late assessment

Where the submission of a late assessment is permitted, late penalties will be consistently applied in this unit.

Where a late assessment **is** permitted for an assessment item or the entirety of the unit (refer to the Assessment Schedule table in this Unit Outline) and the student does not have an approved assessment extension:

1. For assessment items submitted within the first 24 hours after the due date/time, students will be penalised by a deduction of 5% of the total marks allocated for the assessment task;
2. For each additional 24 hour period commenced an additional penalty of 10% of the total marks allocated for the assessment item will be deducted; and
3. Assessment items submitted more than 168 hours late (7 calendar days) will receive a mark of zero.

Where late assessment **is NOT** permitted for an assessment item or the entirety of the unit (refer to the Assessment Schedule table in this Unit Outline) and the student does not have an approved assessment extension:

1. All assessment items submitted after the due date/time will receive a mark of zero.

Assessment extension

Where an application for an assessment extension **is** permitted for an assessment item(s) within this unit (refer to the Assessment Schedule table in this Unit Outline):

1. A student who is unable to complete an assessment item by/on the due date/time as a result of exceptional circumstances beyond the student's control, may apply for an assessment extension on the Assessment Extension Application Form as prescribed by the Academic Registrar. The form is available on the Forms page at https://students.curtin.edu.au/essentials/forms-documents/forms/ and also within the student's OASIS (My Studies tab – Quick Forms) account.
2. The student will be expected to submit their application for an Assessment Extension with supporting documentation:
    a. Australian Campuses: via the online form
    b. Offshore campuses: to the School representative nominated below
3. Timely submission of this information supports the assessment process. For applications that are declined, delayed submission may have significant ramifications on the possible marks awarded.
4. An application may be accepted up to five working days after the due date/time of the assessment item where the student is able to provide a verifiable explanation as to why they were not able to submit the application prior to the assessment due date/time

Where an application for an assessment extension **is NOT** permitted for an assessment item(s) within this unit (refer to the Assessment Schedule table in this Unit Outline):

1. All assessment items submitted after the due date/time will be subject to late penalties or receive a mark of zero depending on the unit permitting late assessment submissions.

Australian campuses – School contact for Assessment Extension enquiries (submission is via the online form):

EECMSstudents@curtin.edu.au

Deferred assessments

If your results show that you have been granted a deferred assessment you should immediately check OASIS for details.

Deferred examinations/tests will be held from 12/07/2021 to 16/07/2021 . Notification to students will be made after the Board of Examiners' meeting via the Official Communications Channel (OCC) in OASIS.

Further assessment

Further assessment is not available in this unit.

Reasonable adjustments for students with disabilities/health circumstances likely to impact on studies

A Curtin Access Plan (CAP) is a document that outlines the type and level of support required by a student with a disability or health condition to have equitable access to their studies at Curtin. Carers for people with disability may also be eligible for support. This support can include alternative exam or test arrangements, study materials in accessible formats, access to Curtin's facilities and services or other support as discussed with an advisor from AccessAbility Services.

Documentation is required from your treating Health Professional to confirm your health circumstances or carer responsibilities.

If you think you may be eligible for a CAP, please contact AccessAbility Services. If you already have a CAP please provide it to the Unit Coordinator in week 1 of each study period.

Referencing style

The referencing style for this unit is IEEE.

More information on this referencing style can be obtained at
http://libraryguides.vu.edu.au/ieeereferencing/gettingstarted

Privacy

As part of a learning or assessment activity, or class participation, your image or voice may be recorded or transmitted by equipment and systems operated by Curtin University. Transmission may be to other venues on campus or to others both in Australia and overseas.

Your image or voice may also be recorded by students on personal equipment for individual or group study or assessment purposes. Such recordings may not be reproduced or uploaded to a publicly accessible web environment. If you wish to make such recordings for study purposes as a courtesy you should always seek the permission of those who are impacted by the recording.

Recording of classes or course materials may not be exchanged or distributed for commercial purposes, for compensation, or for any other purpose other than personal study for the enrolled students in the unit. Breach of this may subject a student to disciplinary action under Statute No 10 – Student Disciplinary Statute.

If you wish to discuss this please talk to your Unit Coordinator.

Copyright

Academic Integrity (including plagiarism and cheating)

Academic Integrity

Curtin's Student Charter, Academic Integrity Program (AIP), and core Values guide expectations regarding student behaviour and responsibilities. Information on these topics can be found on the Student Essentials Website or the Academic Integrity tab in Blackboard.

Academic Integrity Warnings

An Academic Integrity Warning may be issued to a New-to-Curtin student if they have inadequately acknowledged sources or collaborated inappropriately. The Management of Academic Integrity Warnings for New to Curtin Students Procedures provide further information and explain who is considered to be New-to-Curtin.

Academic Misconduct

Students with an academic breach that do not meet the New-to-Curtin criteria will be managed through the misconduct process. Academic Misconduct means conduct by a student that is dishonest or unfair in connection with any academic work. This includes all types of plagiarism, cheating, collusion, falsification or fabrication of data or other content, and Academic Misconduct Other, such as falsifying medical certificates for extension. More details can be found on the Student Essentials Website or on the Academic Integrity Website.

Staff members are required to report suspected misconduct and an inquiry may take place. If misconduct is determined it will result in penalties, which may include a warning, a reduced or nil grade, a requirement to repeat the assessment, an annulled grade (ANN) or termination from the course. Some penalties may impact on future enrolment.

Academic work under inquiry will not be graded until the process has concluded. If your work is the subject of an inquiry you will be notified by email and Official Communication with an opportunity to respond. Appropriate support will be provided. For more information refer to Statute No.10 Student Discipline and Academic Misconduct Rules.

Information and Communications Technology (ICT) Expectations

Curtin students are expected to have reliable internet access in order to connect to OASIS email and learning systems such as Blackboard and Library Services.

You may also require a computer or mobile device for preparing and submitting your work.

For general ICT assistance, in the first instance please contact OASIS Student Support:
oasisapps.curtin.edu.au/help/general/support.cfm

For specific assistance with any of the items listed below, please contact The Learning Centre:
life.curtin.edu.au/learning-support/learning_centre.htm

- Using Blackboard, the I Drive and Back-Up files
- Introduction to PowerPoint, Word and Excel

Additional information

Unit Outline message: Equity, Inclusivity and Belonging

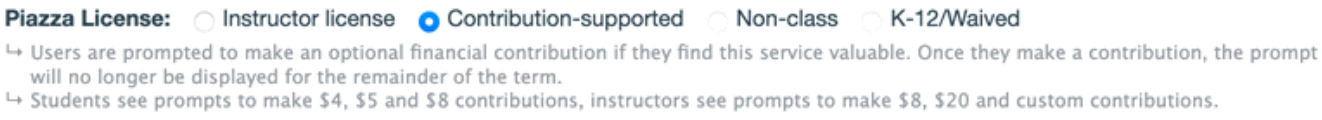
A steering group of SAE academic and professional staff and students has worked on some Unit Outline text designed to raise awareness of Equity and Inclusivity. The text clearly states the Faculty position on providing a safe and inclusive learning environment free of discrimination. If UCs have not yet published their Unit Outlines I encourage you to include the following message at the end of the Introduction (if the Unit Outline has been published consider a statement in a Blackboard announcement):

This unit, in line with current research and university values, strives to achieve a positive and inclusive educational environment. This supports improved academic performance, increased confidence and creates a greater sense of safety and belonging. Your teaching team is committed to providing a safe and inclusive learning experience and requires students to take reasonable and appropriate measures to actively eliminate discrimination on the basis of ability; cultural and social background; and diverse sex, sexuality, and gender.

Link to Equity and Inclusivity web resources:
https://about.curtin.edu.au/values-vision-strategy/diversity-equity/

Piazza

- As users of Piazza will be aware the company has implemented a paid service. They have enabled a transition phase allowing an 'optional contribution' model until August.
- The Faculty is actively investigating options beyond August which may include a different platform with similar functionality.
- Under the transition model, Piazza users can use the platform for free but will be prompted for an optional contribution via a banner. For us this means that staff can still use Piazza integrated into Blackboard as previous.
- **To enable this please select the "Contribution-supported" Piazza License from the "Manage Class" section of your Piazza class.**



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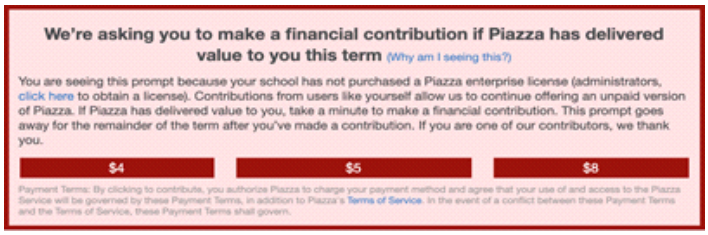


- For us this means that staff can still use Piazza integrated into Blackboard as previous.
- However, please communicate clearly to students that they are not obliged to pay the contribution. Here is some suggested text for Unit Outlines and/or Blackboard announcements.

In this unit we use Piazza, a collaborative communication tool that enables students to pose questions related to unit content and work together on solutions to questions, and questions related to unit administration, assessments etc. which can be answered by fellow students or staff in a timely way. You will be automatically enrolled in Piazza and we recommend using it to post and answer questions.
NOTE: Piazza has an optional contribution through Semester 1 2021 as part of a transition to a new business model. You are NOT required to make a contribution. If you do decide to make a contribution it is in addition to any fees that you pay Curtin and is not refundable.

Turnitin

- Some SAE units allow multiple submissions to Turnitin for the purpose of allowing students to adjust their text based on the similarity index. This leads to:
    - students making minor text adjustments, rather than performing appropriate paraphrasing; or worse, using some of the workarounds that exist that 'hide' copied text from the matching algorithm.
    - sets up the expectation amongst students that they will be able to do this in all units.
- The purpose of using Turnitin is not for students to strive for the lowest or a perceived 'acceptable' similarity index.
- We should limit multiple submissions and be clear with students about the intent when it is allowed – it should not be for a student to adjust down the similarity index.
- Our recommendation is that the number of re-submissions be limited to 2 either by way of separate 'test' and 'final' portals or by marking the second submission. If you do allow more than one Turnitin submissions please be very clear as to the purpose (for example demonstrating which parts of the text need to be better paraphrased rather than avoiding detection of plagiarism).
- Resubmission to Turnitin is appropriate in foundational units or in the first year (particularly designated AI units) where students are learning and are actively being taught how to paraphrase and reference.

Survey Request: Professional Development of Higher Ed Teaching staff in STEM

As part of an international project looking at CPD in our sector please consider taking a small amount of time to complete the following surveys:

Lecturers: everyone who is teaching in STEM disciplines at the Bachelor or Master level at university or technical university. Teaching activities include interaction with students in lectures, problem-solving and other types of active learning sessions, and support of students during experimental or research assignments. (approx. 20 mins to complete) Questionnaire link: https://uva.fra1.qualtrics.com/jfe/form/SV_3R8VociX1W0Xws5

Managers: everyone who is involved in the decision making process about programme curricula and the quality of teaching staff in STEM disciplines. (approx. 20 mins to complete). Questionnaire link: https://uva.fra1.qualtrics.com/jfe/form/SV_1z5evgQQBL7rGuh

Enrolment

It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Student Rights and Responsibilities

It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- Values and Signature Behaviours
- the University's policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University's policies on appropriate use of software and computer facilities

Information on all of the above is available through the University's "Student Rights and Responsibilities" website at: students.curtin.edu.au/rights.

Student Equity

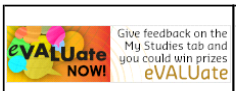
There are a number of factors that might disadvantage some students from participating in their studies or assessments to the best of their ability, under standard conditions. These factors may include a disability or medical condition (e.g. mental illness, chronic illness, physical or sensory disability, learning disability), significant caring responsibilities, pregnancy, religious practices, living in a remote location,or another reason. If you believe you may be unfairly disadvantaged on these or other grounds please contact the appropriate service below. It is important to note that the staff of the University may not be able to meet your needs if they are not informed of your individual circumstances, so please get in touch with the appropriate service if you require assistance.

To discuss your needs in relation to:

- Disability or medical conditions, contact AccessAbility Services: https://students.curtin.edu.au/personal-support/disability/
- Elite athletes, contact Elite Athlete Coordinator: https://stadium.curtin.edu.au/sport/academy/elite-athlete-program/
- All other grounds, contact the Student Wellbeing Advisory Service: https://students.curtin.edu.au/personal-support/counselling-guidance/wellbeing/

Recent unit changes

Students are encouraged to provide unit feedback through ***e*VALUate**, Curtin's online student feedback system. For more information about ***e*VALUate**, please refer to evaluate.curtin.edu.au/info/.

	To view previous student feedback about this unit, search for the Unit Summary Report at https://evaluate.curtin.edu.au/student/unit_search.cfm. See https://evaluate.curtin.edu.au/info/dates.cfm to find out when you can ***e*VALUate** this unit.

Recent changes to this unit include:

DC has been rewritten this semester to better cover modern distribution techniques. This includes:

1. A restructure of material
2. Addition of RESTful web services via .NET MVC as the primary distribution framework
3. The addition of modern distributed computing concerns, such as an introduction to blockchain and peer to peer distributed systems.

Program calendar

Program Calendar – Semester 1 2021

Week	Begin Date	Tutorial	Lecture	Assessment
Orientation	22 February	Orientation Week		
1.	1 March		Introduction to Distributed Systems	
2.	8 March	Build a simple RPC program	A History of Distributed Frameworks.	
3.	15 March	Build a three tiered application	Multi Tiered Architectures	
4.	22 March	Build a simple RESTful service	Web Services	Assignment 1 Released
5.	29 March	Using Javascript to build dynamic applications	Javascript	
6.	5 April	Tuition Free Week		
7.	12 April	Single Page Web Application	Advanced Client Side Scripting	
8.	19 April	Build a peer to peer system	Modern Distributed Computing	Assignment 2 Released
9.	26 April	Build a simple blockchain system	Blockchain	Assignment 1 Due
10.	3 May	Build your own cryptocurrency	Cryptocurrencies	
11.	10 May	Smart Contracts	Advanced applications of Blockchain	
12.	17 May	Assignment 1 Demo	Revision	Assignment 2 Due
13.	24 May	Assignment 2 Demo	Revision	
14.	31 May	Study Week		
15.	7 June	Examinations		
16.	14 June	Examinations		