



ENGG4201

Internet of Things Systems Design

Session 1, Weekday attendance, North Ryde 2021

School of Engineering

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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

Subhas Mukhopadhyay

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9WW 313

Wednesday 2pm to 4pm

Lecturer

Robert Abbas

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Tutor

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Tutor

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Credit points

10

Prerequisites

Completion of 200CP at 1000 level or above or Admission in MEngElecEng

Corequisites

Co-badged status

Unit description

This unit will broadly explore the underlying technologies, applications, and systems design principles underlying the Internet of Things. Students will explore the principles of IoT systems while engaging in their own group-based design and build of a practical IoT system. To support the design and build process, the principles covered will begin with foundation knowledge in IoT devices and systems, including network architectures and technologies, sensors, embedded processing and actuators. Concepts will then build towards notions of IoT communications and data protocols, security, data visualization, Machine Learning and Artificial Intelligence techniques for IoT data, all highlighted by IoT application case studies.

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: Apply knowledge of fundamental components to implement IoT system such as sensors, embedded processors, interfacing electronics and wireless communicating devices, in designing and building a simple IoT system.

ULO2: Select proper hardware to design and implement IoT systems for remote monitoring and control

ULO3: Explain critical IoT communications technologies and network protocols, security and implementation

ULO4: Demonstrate understanding of data management, visualization and analysis techniques for IoT Data

ULO5: Investigate, critically evaluate, and communicate the effectiveness and performance of different IoT systems and their constituent components.

General Assessment Information

Individual research report: Student needs to write all activities on their note book individually. The log on activities will be assessed as 2% every week, from Week#1 to till week#10.

Demonstration of project work: This activity will be assessed as 4 different parts, each of worth 5%. The first 3 activities will be against 5% each, on Week#3, #7 and Week#9. They will be the demonstration of the pracs activities which they do during the workshop. On Week#10, they have to present their plan on their Final project involving the big picture and components level. This will be assessed as 5%.

Final Examination: The Final examination will be based on the weekly lectorial which will be delivered during the time of the workshop. There is no fixed time for the lectorial and can happen during any time between 9:0am to 1:0pm.

Report on practical implementation of IoT project: This activity is divided into 2 parts. 10% is kept on the research report on ML and AI on IoT system. Student can read on the published paper on the topic. The rest 20% is for their design, development, experimental results and report on their final implemented project.

Grading and passing requirement for unit

In order to pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

If you receive special consideration for the final exam, a supplementary exam will be scheduled by the faculty during a supplementary exam period, typically about 3 to 4 weeks after the normal exam period. By making a special consideration application for the final 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 one week prior to the exam with the exact date and time of their supplementary examination.

Hurdle Requirements

The final examination is a hurdle requirement. A grade of 50% or more in the final examination is a condition of passing this unit. 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 supplementary examination period and will be notified of the exact day and time after the publication of final results for the unit. The second attempt at a hurdle assessment is graded as pass fail. The maximum grade for a second attempt is the hurdle threshold grade.

Completion of homework problems is a hurdle requirement. Students must submit reasonable responses to all questions. If submissions do not meet the hurdle requirement, students will be notified and given 1 week to re-submit.

Late submissions and Resubmissions

Unauthorized late submissions will attract a penalty of 10/100 marks per day. Extenuating circumstances will be considered upon lodgement of an application for special consideration or communication with the unit convenor.

Resubmissions of work are not allowed.

Assessment Tasks

| Name | Weighting | Hurdle | Due |
|--|-----------|--------|---------|
| <u>Individual research report</u> | 20% | No | Weekly |
| <u>Demonstration of project work</u> | 20% | No | Weekly |
| <u>Report on practical implementation of IoT project</u> | 30% | No | Week#13 |
| <u>Final Examination</u> | 30% | No | TBA |

Individual research report

Assessment Type ¹: Report

Indicative Time on Task ²: 9 hours

Due: **Weekly**

Weighting: **20%**

Individual research report on IoT literature and application case studies

On successful completion you will be able to:

- Investigate, critically evaluate, and communicate the effectiveness and performance of different IoT systems and their constituent components.

Demonstration of project work

Assessment Type ¹: Demonstration

Indicative Time on Task ²: 9 hours

Due: **Weekly**

Weighting: **20%**

Group-based demonstration of project work

On successful completion you will be able to:

- Apply knowledge of fundamental components to implement IoT system such as sensors, embedded processors, interfacing electronics and wireless communicating devices, in designing and building a simple IoT system.
- Select proper hardware to design and implement IoT systems for remote monitoring and

control

- Explain critical IoT communications technologies and network protocols, security and implementation
- Demonstrate understanding of data management, visualization and analysis techniques for IoT Data

Report on practical implementation of IoT project

Assessment Type ¹: Project

Indicative Time on Task ²: 14 hours

Due: **Week#13**

Weighting: **30%**

Working in groups, students will present the design problem and solution in the form of written report

On successful completion you will be able to:

- Apply knowledge of fundamental components to implement IoT system such as sensors, embedded processors, interfacing electronics and wireless communicating devices, in designing and building a simple IoT system.
- Select proper hardware to design and implement IoT systems for remote monitoring and control
- Explain critical IoT communications technologies and network protocols, security and implementation
- Demonstrate understanding of data management, visualization and analysis techniques for IoT Data

Final Examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 12 hours

Due: **TBA**

Weighting: **30%**

Final Examination

On successful completion you will be able to:

- Apply knowledge of fundamental components to implement IoT system such as sensors, embedded processors, interfacing electronics and wireless communicating devices, in designing and building a simple IoT system.
 - Select proper hardware to design and implement IoT systems for remote monitoring and control
 - Explain critical IoT communications technologies and network protocols, security and implementation
 - Demonstrate understanding of data management, visualization and analysis techniques for IoT Data
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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

Will be uploaded in iLearn

Policies and Procedures

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

[du.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

New unit offering, not applicable

Changes since First Published

| Date | Description |
|------------|-------------|
| 18/02/2021 | Tutor added |