

# Unit Outline

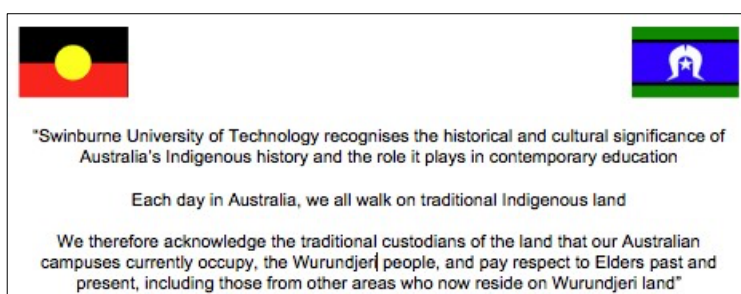
**SWE30011**

## IoT Programming

Semester Sep, 2023

**Please read this Unit Outline carefully. It includes:**

- PART A** Unit summary
- PART B** Your Unit in more detail
- PART C** Further information



## PART A: Unit Summary

<b>Unit Code(s)</b>		SWE30011
<b>Unit Title</b>		IoT Programming
<b>Duration</b>		One semester or equivalent
<b>Total Contact Hours</b>		48 hours
<b>Requisites:</b>		
	<b>Pre-requisites</b>	COS10005 Web Development OR COS10011 Creating Web Applications AND COS20007 Object Oriented Programming OR SWE20004 Technical Software Development
	<b>Co-requisites</b>	-
	<b>Concurrent pre-requisites</b>	-
	<b>Anti-requisites</b>	-
	<b>Assumed knowledge</b>	-
<b>Credit Points</b>		12.5
<b>Campus/Location</b>		Ho Chi Minh City
<b>Mode of Delivery</b>		Lectures (24 hrs), Tutorial Labs (24 hrs)
<b>Assessment Summary</b>		Quizzes Assignments

### Aims

The Internet of Things (IoT) programming unit will teach students the fundamentals of developing an IoT-based solution for Smart Homes, Smart Cities etc., using IoT sensors and devices. Students will learn the skills to work with current popular IoT sensor and platforms (e.g., Arduino and Netatmo) and will have the opportunity to apply these skills in developing innovative IoT-based systems. The unit will be hands-on with students expected to work in groups to design, develop and implement IoT-based systems.

### Unit Learning Outcomes

Students who successfully complete this Unit should be able to:

1. Describe the principles and theoretical concepts in designing and developing Internet of Things systems.
2. Analyse, research and assess different open source and commercial IoT platforms, systems and toolkits.

3. Develop on a variety of open source IoT platforms, devices and software.
4. Develop and integrate cloud and web servers with IoT applications.
5. Communicate effectively and succinctly through oral presentation and written reports

### **Graduate Attributes**

This unit may contribute to the development of the following Swinburne Graduate Attributes:

- Communication skills
- Teamwork skills
- Digital literacies

### **Content**

- Introduction to IoT programming
- IoT programming
- IoT hardware and software
- IoT data management
- IoT networking
- Cloud computing for IoT applications
- APIs and web servers for IoT applications
- IoT Security and Privacy
- Advanced data analytics in IoT

## PART B: Your Unit in more detail

### Unit Teaching Staff

Name	Role	Email	Consultation Time
Dr Tuan TRAN	Lecturer	tuanatran@swin.edu.au	By email appointment

### Learning and Teaching Structure

Activity	Total Hours	Hours per Week	Teaching Period Weeks
Lectures	24 hours	2 hours	Weeks 1 to 12
Tutorial Labs	24 hours	2 hours	Weeks 1 to 12
Independent Learning	102 hours	8.5 hours	Weeks 1 to 12

### Week by Week Schedule

Week	Week Beginning	Teaching and Learning Activity	Student Task or Assessment
1	04 Sep	Introduction	
2	11 Sep	IoT Programming 1: Basics	
3	18 Sep	IoT Programming 2: Edge Server	
4	25 Sep	IoT Programming 3: Interrupts	
5	02 Oct	Data Management	Survey paper submission due on Sunday, 08 Oct at 23:59 (VN Time)
6	09 Oct	APIs and Webservers	
7	16 Oct	IoT Networking	Practical Assignment (Individual) submission due on Sunday, 22 Oct at 23:59 (VN Time).
8	23 Oct	Guest lecture	
9	30 Oct	Cloud Computing for IoT Applications	
10	06 Nov	Guest lecture	Online quiz in class
11	13 Nov	Advanced Topics in IoT 1 (Analytics and Security)	
12	20 Nov	Advanced Topics in IoT 2 (Analytics and Security)	Practical Assignment (group) submission due on Sunday, 26 Nov at 23:59 (VN Time)
13		Demonstration of Group assignment	

## Assessment

### a) Assessment Overview

Tasks and Details	Individual or Group	Weighting	Unit Learning Outcomes that this assessment task relates to	Assessment Due Date
1. Survey Paper	Individual	20%	2,5	Week 5
2. Practical Assignment	Individual	25%	1,2,3,4,5	Week 7
3. Quizzes	Individual	20%	1,2	Week 10
4. Practical Assignment	Group	35%	1,3,4,5	Week 12

### b) Minimum requirements to pass this Unit

As the minimum requirements of assessment to pass a unit and meet all Unit Learning Outcomes, a student must achieve:

(i) aggregate mark for the unit of 50% or more.

### c) Examinations

If the unit you are enrolled in has an official examination, you will be expected to be available for the entire examination period including any Special Exam period.

This unit has no examination.

### d) Submission Requirements

Assessments are to be submitted as directed on Canvas.

Please ensure you keep a copy of all assessments that are submitted.

### e) Extensions and Late Submission

**Late Submissions** - Unless an extension has been approved from the Unit Convenor, late submissions will result in a penalty. You will be penalised 10% of your achieved mark for each working day the task is late, up to a maximum of 5 working days. After 5 working days, a zero result will be recorded. For example, if a student achieves 90/100 on an assessment task but the task was submitted two days late. A late penalty of 20% (of that 90/100 mark) will be applied and the student's final mark will be recorded as 72/100 (being 90 less 09marks/1st day and another 09 mark/2nd day).

**Extension** – please check the university policy for obtaining an extension.

### f) Referencing

To avoid plagiarism, you are required to provide a reference whenever you include information from other sources in your work. Further details regarding plagiarism are available in Section C of this document.

Referencing conventions required for this unit are:

<http://www.swinburne.edu.au/lib/studyhelp/harvard-quick-guide.pdf>

### **g) Groupwork Guidelines**

A group assignment is the collective responsibility of the entire group, and if one member is temporarily unable to contribute, the group should be able to reallocate responsibilities to keep to schedule. In the event of longer-term illness or other serious problems involving a member of group, it is the responsibility of the other members to notify immediately the Unit Convenor or relevant tutor.

Group submissions must be submitted with an Assignment Cover Sheet, signed by all members of the group.

All group members must be satisfied that the work has been correctly submitted. Any penalties for late submission will generally apply to all group members, not just the person who submitted.

All group members should attend the same tutorial.

### **Required Textbook(s)**

Lecture notes can be downloaded from the Canvas web site. These include details on the material you will need to read each week, as well as exercises for you to undertake. The exercises from these notes are to be submitted as the weekly exercises assignments as noted above.

### **Recommended Reading Materials**

Internet of Things: Principles and Paradigms By Rajkumar Buyya, Amir Dastjerdi

The Internet of Things (The MIT Press Essential Knowledge) by Samuel Greengard

The Library has a large collection of resource materials, both texts and current journals. Listed below are some references that will provide valuable supplementary information to this unit. It is also recommended that you explore other sources to broaden your understanding.

Online Databases

<https://www.swinburne.edu.my/library/databases/databases-a.php>

eBooks

<https://www.swinburne.edu.my/library/databases/ebooks.php>

Online Magazines

<https://www.swinburne.edu.my/library/search/magazines.php> \

## PART C: FURTHER INFORMATION



For further information on any of these topics, refer to Swinburne's Current Students web page <https://www.swinburne.edu.my/current-students>

### **Student behaviour and wellbeing**

All students are expected to: act with integrity, honesty and fairness: be inclusive, ethical and respectful of others; and appropriately use University resources, information, equipment and facilities. All students are expected to contribute to creating a work and study environment that is safe and free from bullying, violence, discrimination, sexual harassment, vilification and other forms of unacceptable behaviour.

The [Student Handbook](#) describes what students can reasonably expect from Swinburne in order to enjoy a quality learning experience. The Handbook also sets out what is expected of students with regards to your studies and the way you conduct yourself towards other people and property.

You are expected to familiarise yourself with University regulations and policies and are obliged to abide by these, including the [Student Academic Misconduct Regulations](#), [Student General Misconduct Regulations](#) and the [People, Culture and Integrity Policy](#). Any student found to be in breach of these may be subject to disciplinary processes.

Examples of expected behaviours are:

- conducting yourself in teaching areas in a manner that is professional and not disruptive to others
- following specific safety procedures in Swinburne laboratories, such as wearing appropriate footwear and safety equipment, not acting in a manner which is dangerous or disruptive (e.g. playing computer games), and not bringing in food or drink
- following emergency and evacuation procedures and following instructions given by staff/wardens in an emergency response

### **Canvas**

You should regularly access the Swinburne learning management system, Canvas, which is available via the Current Students webpage or <https://swinburnesarawak.instructure.com/>. Canvas is updated regularly with important unit information and communications.

### **Communication**

All communication will be via your Swinburne email address. If you access your email through a provider other than Swinburne, then it is your responsibility to ensure that your Swinburne email is redirected to your private email address.

### **Academic Integrity**

Academic integrity is about taking responsibility for your learning and submitting work that is honestly your own. It means acknowledging the ideas, contributions and work of others; referencing your sources; contributing fairly to group work; and completing tasks, tests and exams without cheating. Swinburne University uses the Turnitin system, which helps to identify inadequate citations, poor paraphrasing and unoriginal work in assignments that are submitted via Canvas. Your Unit Convenor will provide further details.

Plagiarising, cheating and seeking an unfair advantage with regards to an exam or assessment are all breaches of academic integrity and treated as academic misconduct.

Plagiarism is submitting or presenting someone else's work as though it is your own without full and appropriate acknowledgement of their ideas and work. Examples include:

- using the whole or part of computer program written by another person as your own
- using the whole or part of somebody else's written work in an essay or other assessable work, including material from a book, journal, newspaper article, a website or database, a set of lecture notes, current or past student's work, or any other person's work
- poorly paraphrasing somebody else's work
- using a musical composition or audio, visual, graphic and photographic work created by another
- using realia created by another person, such as objects, artefacts, costumes, models
- submitting assessments that have been developed by another person or service (paid or unpaid), often referred to as contract cheating
- presenting or submitting assignments or other work in conjunction with another person or group of people when that work should be your own independent work. This is regardless of whether or not it is with the knowledge or consent of the other person(s). Swinburne encourages students to talk to staff, fellow students and other people who may be able to contribute to a student's academic work but where an independent assignment is required, the work must be the student's own
- enabling others to plagiarise or cheat, including letting another student copy your work or by giving access to a draft or completed assignment

The penalties for academic misconduct can be severe, ranging from a zero grade for an assessment task through to expulsion from the unit and, in the extreme, exclusion from Swinburne.

### **Student support**

Swinburne offers a range of services and resources to help you complete your studies successfully. Your Unit Convenor or [Student Development and Support](#) can provide information about the study support and other services available for Swinburne students.

### **Special consideration**

If your studies have been adversely affected due to serious and unavoidable circumstances outside of your control (e.g. severe illness or unavoidable obligation), you may be able to apply for special consideration (SPC).

[Applications for Special Consideration](#) to be submitted to Student Information Centre (SIC) normally no later than 5.00pm on the third working day after the submission/sitting date for the relevant assessment component.

### **Accessibility needs**

Sometimes students with a disability, a mental health or medical condition or significant carer responsibilities require reasonable adjustments to enable full access to and participation in education. Your needs can be addressed to Student Counsellors. The plan makes recommendations to university teaching and examination staff. You must notify [AccessAbility Services](#) of your disability or condition within one week after the commencement of your unit to allow the University to make reasonable adjustments.



### **Review of marks**

An independent marker reviews all fail grades for major assessment tasks. In addition, a review of assessment is undertaken if your final result is between 45 and 49 or within 2 marks of any grade threshold.

If you are not satisfied with the result of an assessment, you can ask the Unit Convenor to review the result as a local resolution. Your request must be made in writing within 10 working days of receiving the result. The Unit Convenor will review your result to determine if your result is appropriate. If you are dissatisfied with the outcomes of the review, you can lodge a formal complaint and apply for Reassessment.

### **Feedback, complaints and suggestions**

In the first instance, discuss any issues with your Unit Convenor. If you are dissatisfied with the outcome of the discussion or would prefer not to deal with your Unit Convenor, then you can complete a feedback form. See [Complaints & Feedback](#).

### **Advocacy**

Should you require assistance with any academic issues, University statutes, regulations, policies and procedures, you are advised to seek advice from Academic Department and Student HQ.