

In Progress

Please note that this Unit Profile is still in progress. The content below is subject to change.



ENEE14006 *Embedded Microcontrollers*

Term 2 - 2024

Profile information current as at 15/05/2024 03:20 pm

All details in this unit profile for ENEE14006 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

In this unit, you will learn the concepts of programming, interfacing, and controlling the operations of a microcontroller using the C language. The unit is designed to provide you with an understanding of the architecture and programming of embedded systems with microcontrollers. The course will cover essential programming elements such as data types, loops, branching statements, and functions. Additionally, you will learn about interrupt handling, timers, and counters. Furthermore, you will gain hands-on experience in designing, prototyping, and testing embedded systems using commercially available microcontroller devices. You will be given practical exercises to apply the concepts learned in the unit. The course will also cover advanced topics such as interfacing with peripherals, analog and digital sensors, and communicating with external devices through different communication protocols. Finally, you will design and prototype a real-world application as your final project. To complete the compulsory practical activities and the project, you will be required to purchase the hardware components needed. Please refer to the unit Moodle site for a list of hardware components and their costs. The unit supports the UN sustainable development goal 9 - industry, innovation, and infrastructure by discussing how microcontroller systems could be used in small-scale industries for low-cost automation.

Details

Career Level: *Undergraduate*

Unit Level: *Level 4*

Credit Points: 12

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.25

Pre-requisites or Co-requisites

Prerequisite: (ENEE13020 Digital Electronics AND ENEE13018 Analogue Electronics) OR ENEX12002 Introductory Electronics.

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 2 - 2024

- Mackay
- Mixed Mode

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 12-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 25 hours of study per week, making a total of 300 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Student unit evaluation survey

Feedback

The students appreciated the use of Microsoft Teams to provide timely feedback and support for the project.

Recommendation

Microsoft Teams should be used to provide timely feedback and support to students.

Feedback from Unit Coordinator's self-reflection

Feedback

The current hardware platform used in this unit limits the level of difficulty and complexity that the final project can achieve.

Recommendation

A hardware platform capable of handling challenging projects should be introduced.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Apply structured programming knowledge to develop software solutions
2. Program a microcontroller to interface with external devices such as analog and digital sensors, actuators, and computers
3. Analyse and design microcontroller-based real-time applications using a given industry standard development system and software tools
4. Prototype an embedded microcontroller system for an authentic application
5. Communicate professionally using relevant technical terminology, symbols, and diagrams, and effectively document the design and prototyped solutions
6. Work independently and collaboratively to analyse problems and propose solutions.

The Learning Outcomes for this unit are linked with the Engineers Australia Stage 1 Competency Standards for Professional Engineers in the areas of 1. Knowledge and Skill Base, 2. Engineering Application Ability and 3. Professional and Personal Attributes at the following levels:

Introductory

1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline. (LO: 1N 4N)

1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline. (LO: 4N)

Intermediate

1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline. (LO: 1I 2I 3I 4I)

3.6 Effective team membership and team leadership. (LO: 5I 6I)

Advanced

1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline. (LO: 2I 3I 4A)

1.4 Discernment of knowledge development and research directions within the engineering discipline. (LO: 1I 2I 3I 4A)

1.6 Understanding of the scope, principles, norms, accountabilities, and bounds of sustainable engineering practice in the specific discipline. (LO: 3I 4A)

2.1 Application of established engineering methods to complex engineering problem solving. (LO: 2I 3I 4A)

2.2 Fluent application of engineering techniques, tools, and resources. (LO: 1I 2I 3I 4A)

2.3 Application of systematic engineering synthesis and design processes. (LO: 4A)

2.4 Application of systematic approaches to the conduct and management of engineering projects. (LO: 4A)

3.1 Ethical conduct and professional accountability. (LO: 3I 4I 5A 6A)

3.2 Effective oral and written communication in professional and lay domains. (LO: 5A 6A)

3.3 Creative, innovative and pro-active demeanour. (LO: 3I 4A 5A 6A)

3.4 Professional use and management of information. (LO: 3I 4A 5A 6A)

3.5 Orderly management of self, and professional conduct. (LO: 5A 6A)

Note: LO refers to the Learning Outcome number(s) which link to the competency and the levels: N – Introductory, I – Intermediate and A – Advanced.

Refer to the Engineering Undergraduate Course Moodle site for further information on the Engineers Australia's Stage 1 Competency Standard for Professional Engineers and course level mapping information

<https://moodle.cqu.edu.au/course/view.php?id=1511>

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Written Assessment - 25%	•				•	
2 - Written Assessment - 25%		•	•	•		•
3 - Project (applied) - 50%	•	•	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
1 - Communication					•	•
2 - Problem Solving		•	•	•		•
3 - Critical Thinking		•	•	•		•
4 - Information Literacy					•	
5 - Team Work					•	•
6 - Information Technology Competence		•	•	•		
7 - Cross Cultural Competence						
8 - Ethical practice				•		
9 - Social Innovation						
10 - Aboriginal and Torres Strait Islander Cultures						

Textbooks and Resources

Information for Textbooks and Resources has not been released yet.

This information will be available on Monday 17 June 2024

Academic Integrity Statement

Information for Academic Integrity Statement has not been released yet.

This unit profile has not yet been finalised.