COURSE OUTLINE

ELC304 Embedded System Design

School: School of Science, Technology and Engineering

2026 | Semester 2

UniSC Moreton Bay	BLENDED LEARNING	Most of your course is on campus but you may be able to do some components of this course online.

Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1. Description

In this course you will apply knowledge and techniques to design software and hardware for microcomputer systems, interfaces and applications. You will integrate microcomputer architecture; C language programming; I/O methods and interface techniques to develop structures and software for 8-bit microprocessors.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Seminar – On campus	1hr	Week 1	Once Only
Tutorial/Workshop 1 – On campus	2hrs	Week 2	10 times
Laboratory 1 – On campus	2hrs	Week 1	5 times
Learning materials – Asynchronous learning materials	1hr	Week 1	13 times

1.3. Course Topics

- Microprocessors and applications;
- Structured software programs;
- Embedded system hardware;
- I/O methods
- Memory Organization and hierarchy
- Interface techniques;
- Design of embedded microcomputer systems

2. What level is this course?

300 Level (Graduate)

Demonstrating coherence and breadth or depth of knowledge and skills. Independent application of knowledge and skills in unfamiliar contexts. Meeting professional requirements and AQF descriptors for the degree. May require pre-requisites where discipline specific introductory or developing knowledge or skills is necessary. Normally undertaken in the third or fourth full-time study year of an undergraduate program.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES On successful completion of this course, you should be able to...	GRADUATE QUALITIES MAPPING Completing these tasks successfully will contribute to you becoming...	PROFESSIONAL STANDARD MAPPING * Engineers Australia Stage 1 Professional Engineer Competency Standards
1 Understand a range of high-performance computing systems	Knowledgeable	1.2
2 Explain the operation of memory hierarchy in modern computer system.	Creative and critical thinker	1.3
3 Understand constraints and challenges in real-time embedded systems and apply design techniques to overcome them.	Empowered	1.6
4 Design of small-scale embedded systems using design tools	Empowered	2.2, 2.3
5 Work effectively as a team on implementing a proposed design project and prepare project demonstration and project report.	Engaged	3.6

* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
1.2	Knowledge and Skill Base: Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge within the engineering discipline.
1.6	Knowledge and Skill Base: Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.
2.2	Engineering Application Ability: Fluent application of engineering techniques, tools and resources.
2.3	Engineering Application Ability: Application of systematic engineering synthesis and design processes.
3.6	Professional and Personal Attributes: Effective team membership and team leadership.

5. Am I eligible to enrol in this course?

Refer to the UniSC Glossary of terms for definitions of “pre-requisites, co-requisites and anti-requisites”.

5.1. Pre-requisites

ELC205

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

5.5. Microcredential Information

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

6.2. Details of early feedback on progress

Early feedback will be provided through completion of weekly activities in workshops. Furthermore, feedback on each assessment will be provided which will be used to help with the following assessment.

6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Portfolio	Group	30%	2000 words equivalent	Refer to Format	Online Submission
All	2	Artefact - Technical and Scientific, and Written Piece	Individual	20%	1500 words equivalent	Week 12	Online Submission
All	3	Examination - Centrally Scheduled	Individual	50%	2 hours	Exam Period	Online Assignment Submission with plagiarism check

All - Assessment Task 1: Report-based Workshop Portfolio

GOAL:	To develop your ability to design, build and create computer programs and embedded systems for problem solving and document your conclusions in a portfolio of engineering reports.
PRODUCT:	Portfolio
AUTHORSHIP STATEMENT:	
FORMAT:	You'll work as a group to produce a portfolio of computer programs, embedded systems and related information in the form of a document of 2000 words equivalent including figures, text, and diagrams. Submit the portfolios in Weeks 5, 8 and 11.
CRITERIA:	**No.** — **Learning Outcome assessed** 1 Selection of appropriate programming constructs or components to design embedded systems — 3 4 5
GENERIC SKILLS:	Collaboration, Problem solving, Applying technologies

All - Assessment Task 2: Technical engineering artefact

GOAL:	To develop your understanding of core theory and enable you to demonstrate your knowledge and skills in developing computer programs and embedded systems of significant complexity.
PRODUCT:	Artefact - Technical and Scientific, and Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	For this task you will produce a consolidated written artefact adhering to a specified structure that is approximately 1500 words equivalent in length including figures, text, and diagrams.
CRITERIA:	

No.		Learning Outcome assessed
1	Demonstration of efficient and effective techniques and skills to develop embedded systems and circuits programs or logic circuits	1 2
2	Presentation of computer code and engineering drawings using the appropriate format, symbols and projection standards	4
3	Communication of design specifications using appropriate engineering terminology and symbols	4

GENERIC SKILLS:	Problem solving, Applying technologies

All - Assessment Task 3: Final Examination

GOAL:	The final exam will develop your ability to independently apply your skills and knowledge to solve familiar problem based questions with confidence within a set time limit and without access to additional resources.
PRODUCT:	Examination - Centrally Scheduled
AUTHORSHIP STATEMENT:	
FORMAT:	Centrally scheduled 2-hour closed book examination.
CRITERIA:	

No.		Learning Outcome assessed
1	Selection of appropriate mathematical theory and programming constructs	1 2
2	Correct application of theory and knowledge to solve engineering problems	3
3	Communication of solutions using appropriate engineering terminology, symbols and diagrams	3

GENERIC SKILLS:	Problem solving, Applying technologies

7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

> There are no required/recommended resources for this course.

8.2. Specific requirements

Not applicable

9. How are risks managed in this course?

Risk assessments have been performed for all studio and laboratory classes and a low level of health and safety risk exists. Some risk concerns may include equipment, instruments, and tools; as well as manual handling items within the laboratory. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment Your eligibility for supplementary assessment in a course is dependent of the following conditions applying: The final mark is in the percentage range 47% to 49.4% The course is graded using the Standard Grading scale You have not failed an assessment task in the course due to academic misconduct

10.3. Assessment: Submission penalties

Late submission of assessment tasks may be penalised at the following maximum rate: - 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task. - 10% (of the assessment task's identified value) for the third day - 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task. - A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task. Weekdays and weekends are included in the calculation of days late. To request an extension you must contact your course coordinator to negotiate an outcome.

10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The Student Charter sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

10.6. General Enquiries

In person:

- **UniSC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **UniSC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **UniSC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **UniSC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **UniSC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **UniSC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

Tel: +61 7 5430 2890

Email: studentcentral@usc.edu.au