COURSE OUTLINE

ELC200 Digital Logic and Computer Programming

School: School of Science, Technology and Engineering

2026 | Trimester 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

The ability to program computers and electronic instrumentation is an important skill for engineers. This course will build on the introductory content. It will help you to increase your specific understanding and knowledge of algorithms, data types and digital logic to develop more complex computer programming applications using the C programming language. This course will also provide you the knowledge on understanding arithmetic components and microcontroller architectures.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous Learning Material	1hr	Week 1	12 times
Tutorial/Workshop 1 – On Campus tutorial	2hrs	Week 1	10 times
Laboratory 1 – On campus lab	2hrs	Week 4	5 times
Seminar – On campus seminar	1hr	Week 1	Once Only

1.3. Course Topics

Topics may include:

- Logic Gates and Boolean Expression
- Universal Gates and Karnaugh Maps
- Latches and Flip Flops
- Counters
- Arithmetic Circuits and Microcontroller Architectures
- Programming and Data Types in C
- Functions in C
- Selection Statements in C
- Loop Statements in C
- Pointers and Arrays
- Dynamic Data Structures

2. What level is this course?

200 Level (Developing)

Building on and expanding the scope of introductory knowledge and skills, developing breadth or depth and applying knowledge and skills in a new context. May require pre-requisites where discipline specific introductory knowledge or skills is necessary. Normally, undertaken in the second or third full-time year of an undergraduate programs.

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 * Competencies from multiple Professional Bodies (see below) *
1 Demonstrate fundamental digital logic theory and knowledge of mathematical principles in the operation of logic circuits.	Knowledgeable	1, 1, 1.2.a, 1.2.a, 1.3.a, 1.3.a, 1.2, 1.2, 1.3, 1.3
2 Apply practical skills and digital logic and computer programming for problem solving.	Empowered	2.2.a, 2.2.a, 2.2.b, 2.2.b, 2.1, 2.1, 2.2, 2.2
3 Select appropriate programming elements and constructs to design and build a range of computer programs.	Empowered	1.2.a, 1.2.a, 1.2, 1.2
4 Work collaboratively in teams to design computer programs and simple digital circuits to meet specified requirements.	Engaged	3.6.a, 3.6.a, 3.6, 3.6
5 Communicate ideas and designs using appropriate engineering terminology, symbols and illustrations.	Engaged	3.2, 3.2

* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 ENGINEERING TECHNOLOGIST COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
1.2.a	Knowledge and Skill Base - Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the technology domain: Fluently applies relevant investigation, analysis, interpretation, assessment, characterisation, prediction, evaluation, modelling, decision making, measurement, evaluation, knowledge management and communication tools and techniques pertinent to the technology domain.
1.3.a	Knowledge and Skill Base - In-depth understanding of specialist bodies of knowledge within the technology domain: Proficiently applies advanced technical knowledge and skills to deliver engineering outcomes in specialist area(s) of the technology domain and associated industry, commercial and community sectors.
1.2	Knowledge and Skill Base: Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the technology domain.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge within the technology domain.
2.2.a	Engineering Application Ability - Application of engineering techniques, tools and resources within the technology domain: Proficiently identifies, selects and applies the materials, components, devices, systems, processes, resources, plant and equipment relevant to the technology domain.
2.2.b	Engineering Application Ability - Application of engineering techniques, tools and resources within the technology domain: Understands the principles, limitations and accuracy of mathematical, physical or computational modelling.

CODE	COMPETENCY
2.1	Engineering Application Ability: Application of established engineering methods to broadly-defined problem solving within the technology domain.
2.2	Engineering Application Ability: Application of engineering techniques, tools and resources within the technology domain.
3.6.a	Professional and Personal Attributes - Effective team membership and team leadership: Understands the fundamentals of team dynamics and leadership.
3.2	Professional and Personal Attributes: Effective oral and written communication in professional and lay domains.
3.6	Professional and Personal Attributes: Effective team membership and team leadership.
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
1.2.a	Knowledge and Skill Base - Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline: Develops and fluently applies relevant investigation analysis, interpretation, assessment, characterisation, prediction, evaluation, modelling, decision making, measurement, evaluation, knowledge management and communication tools and techniques pertinent to the engineering discipline.
1.3.a	Knowledge and Skill Base - In-depth understanding of specialist bodies of knowledge within the engineering discipline: Proficiently applies advanced technical knowledge and skills in at least one specialist practice domain of the engineering discipline.
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.
2.2.a	Engineering Application Ability - Fluent application of engineering techniques, tools and resources: Proficiently identifies, selects and applies the materials, components, devices, systems, processes, resources, plant and equipment relevant to the engineering discipline.
2.2.b	Engineering Application Ability - Fluent application of engineering techniques, tools and resources: Constructs or selects and applies from a qualitative description of a phenomenon, process, system, component or device a mathematical, physical or computational model based on fundamental scientific principles and justifiable simplifying assumptions.
2.1	Engineering Application Ability: Application of established engineering methods to complex engineering problem solving.
2.2	Engineering Application Ability: Fluent application of engineering techniques, tools and resources.
3.6.a	Professional and Personal Attributes - Effective team membership and team leadership: Understands the fundamentals of team dynamics and leadership.
3.2	Professional and Personal Attributes: Effective oral and written communication in professional and lay domains.
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

ENG103 or ENG106

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

Performance and feedback from the workshop tasks will demonstrate the level of proficiency and understanding of the course material.

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	Practical / Laboratory Skills, and Written Piece	Group	30%	1500 words	Week 7	Online Assignment Submission with plagiarism check
All	2	Quiz/zes	Individual	30%	6 x quizzes	Throughout teaching period (refer to Format)	Online Assignment Submission with plagiarism check
All	3	Examination - Centrally Scheduled	Individual	40%	2 hours	Exam Period	Online Assignment Submission with plagiarism check

All - Assessment Task 1: Project

GOAL:	Experimental work and / or projects to verify students ability to apply knowledge and skills acquired in the course.
PRODUCT:	Practical / Laboratory Skills, and Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	Experimental work and / or projects to verify students ability to apply knowledge and skills acquired in the course.
CRITERIA:	

No.		Learning Outcome assessed
1	Demonstration of fundamental digital logic theory and knowledge of mathematical principles in the operation of logic circuits.	1
2	Application of practical skills and digital logic and computer programming for problem solving.	1 2
3	Communication of ideas and designs using appropriate engineering terminology, symbols and illustrations.	1 5
4	Collaboration in teams to design computer programs and simple digital circuits to meet specified requirements.	2 4
5	Selection of appropriate programming elements and constructs to design and build a range of computer programs.	1 2 3

GENERIC SKILLS:	Collaboration, Problem solving, Organisation, Applying technologies, Information literacy

All - Assessment Task 2: Quizzes

GOAL:	Relevant tasks and problems to enforce understanding of the students and help in gradual development of knowledge and skills throughout the course.
PRODUCT:	Quiz/zes
AUTHORSHIP STATEMENT:	
FORMAT:	Relevant tasks and problems to enforce understanding of the students and help in gradual development of knowledge and skills throughout the course. Weeks 2, 4, 6, 8, 10 & 12.
CRITERIA:	

No.		Learning Outcome assessed
1	Demonstration of fundamental digital logic theory and knowledge of mathematical principles in the operation of logic circuits.	1 2 5
2	Application of practical skills and digital logic and computer programming for problem solving.	1 2 5

GENERIC SKILLS:	Problem solving, Organisation

All - Assessment Task 3: Final exam

GOAL:	Questions and problems related to the materials covered in the course.
PRODUCT:	Examination - Centrally Scheduled
AUTHORSHIP STATEMENT:	
FORMAT:	Questions and problems related to the materials covered in the course.
CRITERIA:	

No.		Learning Outcome assessed
1	Demonstration of fundamental digital logic theory and knowledge of mathematical principles in the operation of logic circuits.	1
2	Application of practical skills and digital logic and computer programming for problem solving.	1 2 3
3	Communication of ideas and designs using appropriate engineering terminology, symbols and illustrations.	1 2 5

GENERIC SKILLS:	Communication, Problem solving, Organisation, Applying technologies, Information literacy

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

You need regular access to the resource(s) below. Many texts are available as ebooks through the Library at no additional cost.

REQUIRED?	AUTHOR	YEAR	TITLE	EDITION	PUBLISHER
Recommended	Jeri R. Hanly,Elliot B. Koffman,Mohit P. Tahiliani	0	Problem Solving and Program Design in C, Global Edition	8th Edition	n/a
Recommended	Neal S. Widmer,Ronald J. Tocci,Gregory L. Moss	0	Digital Systems	n/a	n/a

8.2. Specific requirements

Fully enclosed shoes must be worn in the engineering laboratory. If you do not have the correct shoes you will not be allowed to do the practical. You must also undertake the laboratory induction before you can undertake any practical.

9. How are risks managed in this course?

Risk assessments have been conducted for the field activities being undertaken and a high level of risk has been identified. High level risk may include, boating, diving, and hot works such as welding, cutting and grinding. Where high risks exist you will be given training and advice about how to control the high level risk, however it is also your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety 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:
(a) The final mark is in the percentage range 47% to 49.4%; and
(b) The course is graded using the Standard Grading scale

10.3. Assessment: Submission penalties

Late submissions may be penalised up to and including the following maximum percentage of the assessment task's identified value, with weekdays and weekends included in the calculation of days late:
(a) One day: deduct 5%;
(b) Two days: deduct 10%;
(c) Three days: deduct 20%;
(d) Four days: deduct 40%;
(e) Five days: deduct 60%;
(f) Six days: deduct 80%;
(g) Seven days: A result of zero is awarded for the assessment task.

The following penalties will apply for a late submission for an online examination:
Less than 15 minutes: No penalty
From 15 minutes to 30 minutes: 20% penalty
More than 30 minutes: 100% penalty

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

For course-specific questions, contact your teaching staff or Course Coordinator.

For other enquiries or to access support, please contact Student Central:

- UniSC Student Central
- UniSC Adelaide Student Central