

# ELC500 Electronic Design

**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.

Online

**ONLINE**

You can do this course without coming onto campus, unless your program has specified a mandatory onsite requirement.

*Please go to [usc.edu.au](http://usc.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 advance your knowledge and skills in the design, analysis and applications of electronic circuits. You will be able to design more complex and intelligent circuits by the specification and application of specialised electronic components. This project-based course will focus on developing skills at the graduate level.

### 1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
<b>BLENDED LEARNING</b>			
<b>Learning materials</b> – Asynchronous learning material	1hr	Week 1	12 times
<b>Seminar</b> – On campus seminar	1hr	Week 1	2 times
<b>Laboratory 1</b> – Mandatory on campus intensive	10hrs	Break week	Once Only
<b>ONLINE</b>			
<b>Learning materials</b> – Asynchronous learning material	1hr	Week 1	12 times
<b>Seminar</b> – Online seminar	1hr	Week 1	2 times
<b>Laboratory 1</b> – Mandatory on campus intensive	10hrs	Break week	Once Only

### 1.3. Course Topics

Topics may include:

- Field-Effect Transistors
- Bipolar Junction Transistors
- Operational Amplifiers
- Differential and Instrumentation Amplifiers
- Active Filters
- Oscillators
- Introduction to PCB Electronic Design
- PCB Design – Schematic Capture
- PCB Design - Routing
- PCB Design – Signal and Power Integrity
- PCB Design – Power Dissipation and Heatsinks
- PCB Design – Noise in Electronic Circuits

### 2. What level is this course?

500 Level (Advanced)

Engaging with new discipline knowledge and skills at an advanced level or deepening existing knowledge and skills within a discipline. Independent application of knowledge and skills in unfamiliar contexts.

### 3. What is the unit value of this course?

12 units

### 4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES	GRADUATE QUALITIES MAPPING	PROFESSIONAL STANDARD MAPPING *
On successful completion of this course, you should be able to...	Completing these tasks successfully will contribute to you becoming...	Competencies from multiple Professional Bodies (see below) *
1 Synthesize approaches to electronic design.	Creative and critical thinker	2, 2, 2.1.a, 2.1.a, 2.1.b, 2.1.b, 2.1, 2.1
2 Demonstrate and justify the choice, application, and operation of different electronic designs to meet different operating conditions.	Creative and critical thinker	2, 2, 2.1.a, 2.1.a, 2.1, 2.1
3 Apply the fundamental principles to electronic design for various real industry applications.	Empowered	2, 2, 2.2.a, 2.2.a, 2.2, 2.2
4 Apply electronic design approaches to develop solutions to typical industry problems.	Empowered	2, 2, 2.2.a, 2.2.a, 2.2, 2.2
5 Identify and critically appraise current developments in the field and summarize the characteristics of various electronic designs.	Creative and critical thinker Engaged	1, 1, 1.4.a, 1.4.a, 1.4, 1.4
6 Identify different approaches to applying circuit theory.	Knowledgeable	1, 1, 1.3.a, 1.3.a, 1.3, 1.3
7 Synthesise and critically evaluate core course concepts and their interrelationships and effectively communicate a comprehensive understanding of the course's main ideas and their broader implications.	Knowledgeable Creative and critical thinker Empowered Communication Problem solving Applying technologies	1.3.a, 1.4.a, 1.3, 1.4, 3.2.a, 3.2

\* Competencies by Professional Body

CODE	COMPETENCY
<b>ENGINEERS AUSTRALIA STAGE 1 ENGINEERING TECHNOLOGIST COMPETENCY STANDARDS</b>	
1	Elements of competency: Knowledge and Skill Base
1.4.a	Knowledge and Skill Base - Discernment of knowledge development within the technology domain: Identifies and critically appraises current developments and emerging issues professionally disseminated in specialist practice area(s) of 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.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge within the technology domain.
1.4	Knowledge and Skill Base: Discernment of knowledge development within the technology domain.
2	Elements of competency: Engineering Application Ability
2.1.a	Engineering Application Ability - Application of established engineering methods to broadly-defined problem solving within the technology domain: Identifies, discerns and characterises salient issues, determines and analyses causes and effects, justifies and applies appropriate simplifying assumptions, predicts performance and behaviour, synthesises solution strategies and develops substantiated conclusions.
2.1.b	Engineering Application Ability - Application of established engineering methods to broadly-defined problem solving within the technology domain: Ensures that the application of specialist technologies are soundly based on fundamental principles by diagnosing, and taking appropriate action with data, calculations, results, proposals, processes, practices, and documented information that may be ill-founded, illogical, erroneous, unreliable or unrealistic.
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.
2.1	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.
<b>ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS</b>	
1	Elements of competency: Knowledge and Skill Base
1.4.a	Knowledge and Skill Base - Discernment of knowledge development and research directions within the engineering discipline: Identifies and critically appraises current developments, advanced technologies, emerging issues and interdisciplinary linkages in at least one specialist practice domain of 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.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge within the engineering discipline.
1.4	Knowledge and Skill Base: Discernment of knowledge development and research directions within the engineering discipline.
2	Elements of competency: Engineering Application Ability
2.1.a	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Identifies, discerns and characterises salient issues, determines and analyses causes and effects, justifies and applies appropriate simplifying assumptions, predicts performance and behaviour, synthesises solution strategies and develops substantiated conclusions.
2.1.b	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Ensures that all aspects of an engineering activity are soundly based on fundamental principles - by diagnosing, and taking appropriate action with data, calculations, results, proposals, processes, practices, and documented information that may be ill-founded, illogical, erroneous, unreliable or unrealistic.
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.

CODE	COMPETENCY
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- |       |   |
|-------|---|
| 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.   |
| 3.2.a | Professional and Personal Attributes - Effective oral and written communication in professional and lay domains: Is proficient in listening, speaking, reading and writing English. |
| 3.2   | Professional and Personal Attributes: Effective oral and written communication in professional and lay domains.   |

## 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

Enrolled in MC005

### 5.2. Co-requisites

Not applicable

### 5.3. Anti-requisites

Not applicable

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

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	Practical / Laboratory Skills, and Written Piece	Individual	20%	2000 words	Week 12	Online Assignment Submission with plagiarism check
All	2	Quiz/zes	Individual	20%	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	4	Oral	Individual	20%	A 10-12 minute presentation which may be followed by approximately 5-10 minutes of questions.	Week 12	Online Submission

**All - Assessment Task 1: Project**

<b>GOAL:</b>	Projects to verify students' ability to apply knowledge and skills acquired in the course.		
<b>PRODUCT:</b>	Practical / Laboratory Skills, and Written Piece		
<b>FORMAT:</b>	Relevant tasks and problems to enforce understanding of the students and help in the gradual development of knowledge and skills throughout the course. Projects to verify students' ability to apply knowledge and skills acquired in the course.		
<b>CRITERIA:</b>	<b>No.</b>		<b>Learning Outcome assessed</b>
	1	Synthesis of approaches to electronic design.	1 5 6
	2	Demonstration and justification of the choice, application, and operation of different electronic designs to meet different operating conditions.	2 5 6
	3	Application of the fundamental principles to electronic design for various real industry applications.	1 2 3
<b>GENERIC SKILLS:</b>	Communication, Problem solving, Organisation, Applying technologies, Information literacy		

**All - Assessment Task 2: Quizzes**

<b>GOAL:</b>	Questions and problems related to the materials covered in the course.		
<b>PRODUCT:</b>	Quiz/zes		
<b>FORMAT:</b>	Questions and problems related to the materials covered in the course. Weeks 2, 4, 6, 8, 10 & 12.		
<b>CRITERIA:</b>	<b>No.</b>		<b>Learning Outcome assessed</b>
	1	Synthesis of approaches to electronic design.	1 2 5
	2	Demonstration and justification of the choice, application, and operation of different electronic designs to meet different operating conditions.	1 2
	3	Identification of different approaches to applying circuit theory.	2 5 6
	4	Identification and critical appraisal of current developments in the field and summary of the characteristics of various electronic designs.	5
<b>GENERIC SKILLS:</b>	Communication, Problem solving, Organisation, Applying technologies		

### All - Assessment Task 3: Final exam

<b>GOAL:</b>	Conceptual questions and numerical problems related to the materials covered in the course.	
<b>PRODUCT:</b>	Examination - Centrally Scheduled	
<b>FORMAT:</b>	Conceptual questions and numerical problems related to the materials covered in the course.	
<b>CRITERIA:</b>	<b>No.</b>	<b>Learning Outcome assessed</b>
	1	Synthesis of approaches to electronic design. 1
	2	Demonstration and justification of the choice, application, and operation of different electronic designs to meet different operating conditions. 2
	3	Application of the fundamental principles to electronic design for various real industry applications. 3
	4	Application of electronic design approaches to develop solutions to typical industry problems. 4
	5	Identification and critical appraisal of current developments in the field and summary of the characteristics of various electronic designs. 5
	6	Identification of different approaches to applying circuit theory. 6
<b>GENERIC SKILLS:</b>	Problem solving, Applying technologies, Information literacy	

### All - Assessment Task 4: Course summary and critical evaluation

<b>GOAL:</b>	To assess your ability to synthesise and critically evaluate the course's core concepts, demonstrating a sophisticated and integrated understanding of its main ideas, their interrelationships, and broader implications.	
<b>PRODUCT:</b>	Oral	
<b>FORMAT:</b>	Presentation	
<b>CRITERIA:</b>	<b>No.</b>	<b>Learning Outcome assessed</b>
	1	Synthesis & Critical Evaluation: Integrated and insightful critiques of core course concepts and their interrelationships. 7
	2	Clarity & Communication: Well-organised, engaging, and clear presentation, effectively using visuals to enhance understanding. 7
	3	Engagement & Understanding: Accurate and thoughtful responses to questions, demonstrating deep understanding and critical thinking. 7
<b>GENERIC SKILLS:</b>	Communication, Problem solving	

## 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 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. SafeUniSC

UniSC is committed to a culture of respect and providing a safe and supportive environment for all members of our community. For immediate assistance on campus contact SafeUniSC by phone: [07 5430 1168](tel:0754301168) or using the [SafeZone](#) app. For general enquires contact the SafeUniSC team by phone [07 5456 3864](tel:0754563864) or email [safe@usc.edu.au](mailto:safe@usc.edu.au).

The SafeUniSC Specialist Service is a Student Wellbeing service that provides free and confidential support to students who may have experienced or observed behaviour that could cause fear, offence or trauma. To contact the service call [07 5430 1226](tel:0754301226) or email [studentwellbeing@usc.edu.au](mailto:studentwellbeing@usc.edu.au).

### 10.5. Study help

For help with course-specific advice, for example what information to include in your assessment, you should first contact your tutor, then your course coordinator, if needed.

If you require additional assistance, the Learning Advisers are trained professionals who are ready to help you develop a wide range of academic skills. Visit the [Learning Advisers](#) web page for more information, or contact Student Central for further assistance: +61 7 5430 2890 or [studentcentral@usc.edu.au](mailto:studentcentral@usc.edu.au).

## 10.6. Wellbeing Services

Student Wellbeing provide free and confidential counselling on a wide range of personal, academic, social and psychological matters, to foster positive mental health and wellbeing for your academic success.

To book a confidential appointment go to [Student Hub](#), email [studentwellbeing@usc.edu.au](mailto:studentwellbeing@usc.edu.au) or call 07 5430 1226.

## 10.7. AccessAbility Services

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, learning disorder mental health issue, injury or illness, or you are a primary carer for someone with a disability or who is considered frail and aged, [AccessAbility Services](#) can provide access to appropriate reasonable adjustments and practical advice about the support and facilities available to you throughout the University.

To book a confidential appointment go to [Student Hub](#), email [AccessAbility@usc.edu.au](mailto:AccessAbility@usc.edu.au) or call 07 5430 2890.

## 10.8. 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>

## 10.9. 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.

## 10.10. 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](mailto:studentcentral@usc.edu.au)