COURSE OUTLINE

ELC206 Analog and Digital Electronics

School: School of Science, Technology and Engineering

2026 | Trimester 1

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

This course will enable a student to develop the basic knowledge and gain an understanding of electrical circuit analysis and the analog electronic devices such as operation of diodes, transistors and operational amplifiers and their applications, analysis and design in practical circuits. Also, through this course a student will be able to develop an awareness of the advantages and limitations of solving combinational logic problems, confidence in the analysis of practical logic circuits and the use of software to demonstrate the validity of the theory.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous weekly learning material	1hr	Week 1	12 times
Seminar – On campus	1hr	Week 1	3 times
Tutorial/Workshop 1 – On campus	2hrs	Week 1	10 times
Laboratory 1 – On campus	2hrs	Week 2	5 times

1.3. Course Topics

Topics may include:

- Introduction to Electrical Circuits
- Resistive Circuits
- Inductance and Capacitance
- Transients
- Steady-State Sinusoidal Analysis
- Frequency Response
- Logic Circuits
- Microcontrollers and Computer-Based Instrumentation Systems
- Diodes
- Basic Amplifier Concepts
- NMOS and PMOS Transistors

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 in-depth discipline specific understanding to describe the application of semiconductor devices to power supplies and basic amplifier circuits.	Knowledgeable	1, 1, 1.3.a, 1.3.a, 1.3, 1.3
2 Apply advanced technical knowledge to describe the principles used to implement combinational logic functions and its limitations.	Knowledgeable	1, 1, 1.3.a, 1.3.a, 1.3, 1.3
3 Analyse analog and digital circuits to demonstrate and verify the validity of theory.	Creative and critical thinker	2, 2, 2.1.a, 2.1.a, 2.1, 2.1
4 Critically evaluate operational amplifier circuits with alternative configurations and determine performance expected from them to synthesize an optimal solution for specific applications.	Creative and critical thinker	2, 2, 2.1.f, 2.1.f, 2.1, 2.1
5 Apply technical knowledge to design, construct and test logic circuits and operational amplifiers for nonlinear applications to meet specifications.	Empowered	2, 2, 2.3.a, 2.3.a, 2.3, 2.3
6 Determine failure modes in electronic circuits using appropriate instrumentation and software and applying simple fault finding technique.	Empowered	2, 2, 2.2.c, 2.2.c, 2.2.d, 2.2.d, 2.2, 2.2

* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 ENGINEERING TECHNOLOGIST COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
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.
2	Elements of competency: Engineering Application Ability

CODE	COMPETENCY
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.f	Engineering Application Ability - Application of established engineering methods to broadly-defined problem solving within the technology domain: Critically evaluates alternative implementation approaches using specialist engineering technologies and evaluates potential outcomes against appropriate criteria to justify an optimal solution choice.
2.3.a	Engineering Application Ability - Application of systematic synthesis and design processes within the technology domain: Proficiently applies technological knowledge and problem solving skills as well as established tools and procedures to design components, system elements, plant, facilities and/or processes to meet technical specifications and performance criteria.
2.2.c	Engineering Application Ability - Application of engineering techniques, tools and resources within the technology domain: Selects and applies such models in the representation of phenomenon, processes, systems, components or devices.
2.2.d	Engineering Application Ability - Application of engineering techniques, tools and resources within the technology domain: Determines properties, performance, safe working limits, failure modes, and other inherent parameters of materials, components and systems relevant to specialist area(s) of 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.
2.3	Engineering Application Ability: Application of systematic synthesis and design processes within the technology domain.
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
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.
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.f	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Conceptualises alternative engineering approaches and evaluates potential outcomes against appropriate criteria to justify an optimal solution choice.
2.3.a	Engineering Application Ability - Application of systematic engineering synthesis and design processes: Proficiently applies technical knowledge and open ended problem solving skills as well as appropriate tools and resources to design components, elements, systems, plant, facilities and/or processes to satisfy user requirements.
2.2.c	Engineering Application Ability - Fluent application of engineering techniques, tools and resources: Determines properties, performance, safe working limits, failure modes, and other inherent parameters of materials, components and systems relevant to the engineering discipline.
2.2.d	Engineering Application Ability - Fluent application of engineering techniques, tools and resources: Applies a wide range of engineering tools for analysis, simulation, visualisation, synthesis and design, including assessing the accuracy and limitations of such tools, and validation of their results.
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.
2.3	Engineering Application Ability: Application of systematic engineering synthesis and design processes.

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

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	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: Practical / Laboratory Skills, and Written Piece

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	Analysis of analog and digital circuits to demonstrate and verify the validity of theory.	1 2 3
2	Critical evaluation of operational amplifier circuits with alternative configurations and determination of performance expected from them to synthesize an optimal solution for specific applications.	1 4
3	Application of technical knowledge to design, construct and test logic circuits and operational amplifiers for nonlinear applications to meet specifications.	1 2 3 5
4	Determination of failure modes in electronic circuits using appropriate instrumentation and software and applying simple fault finding technique.	3 6

GENERIC SKILLS:	Communication, 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	Analysis of analog and digital circuits to demonstrate and verify the validity of theory.	3
2	Critical evaluation of operational amplifier circuits with alternative configurations and determination of performance expected from them to synthesize an optimal solution for specific applications.	4
3	Demonstration of in-depth discipline specific understanding to describe the application of semiconductor devices to power supplies and basic amplifier circuits.	1
4	Application of advanced technical knowledge to describe the principles used to implement combinational logic functions and its limitations.	2

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

All - Assessment Task 3: Examination

GOAL:	Questions and problems related to the course contents
PRODUCT:	Examination - Centrally Scheduled
AUTHORSHIP STATEMENT:	
FORMAT:	Questions and problems related to the course contents

CRITERIA:

No.		Learning Outcome assessed
1	Analysis of analog and digital circuits to demonstrate and verify the validity of theory.	1 3
2	Critical evaluation of operational amplifier circuits with alternative configurations and determination of performance expected from them to synthesize an optimal solution for specific applications.	3 4
3	Demonstration of in-depth discipline specific understanding to describe the application of semiconductor devices to power supplies and basic amplifier circuits.	1
4	Application of advanced technical knowledge to describe the principles used to implement combinational logic functions and its limitations.	2

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

There are no required/recommended resources for this course.

8.2. Specific requirements

Not applicable

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is 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

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 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