Course Outline

University of South Australia | Online

UO Circuits and Signals

EEET 1028 Study Period 6 - 2021

External - Online Activity - Online

Introduction

Welcome

Welcome to Circuits and Signals!

This course follows on from Electrical and Electronic Systems. In E&ES, we introduced key components and how they are used in simple circuits.

In this course, we will look at circuit analysis techniques that allow us to model the behaviour of more complex circuits. Some techniques - nodal and mesh analysis - are able to turn any circuit into a set of simultaneous equations for voltage or current that can be solved. Other techniques, such as Superposition and the Norton and Thevenin Equivalents are useful in specific situations.

We will also look at how circuits respond to various signals. We will see how circuits behave when first and second order transients occur, and how the performance of circuits varies as the frequency of input signals changes.

The content we cover in this course requires a good knowledge of both Electrical and Electronic Systems, and Mathematical Methods for Engineers 2. Concepts covered in this course will allow you to understand many more complicated concepts in electrical and electronic engineering.

We hope that you enjoy studying this course, and gaining a deeper understanding of electrical circuits and the signals that they carry.

Academic Work Definitions

External mode includes online, distance education, industry placement or directed research. Virtual classrooms are deemed to be an external mode of delivery. External mode does not normally include a face to face component, however some courses offered in external mode may require a small component of on-campus activity, or practical sessions.

The expectations of your activity and preparation for each course will be aligned to the activity being undertaken. For example, if you are studying externally and there are virtual lectures, your preparation would be as listed under the lecture section of this guide.

You may also be supported through online facilitation, with preparation required, and other learning activities provided in your course, that will each have specific preparation requirements for you. These requirements should be set out in individual course guides.

Peer Interaction is usually included in UniSA courses in both external and internal modes of delivery and is considered a critical element of the learning process that may involve activities, projects, discussion forums, presentations, practicals, workshops.

Online facilitation

Student information

Online courses generally require students to independently read, view and/or work through all required materials, including pre-recorded presentations that have been produced and provided to facilitate this form of learning.

Independent online learning is supported by Online Facilitators who supplement online teaching resources by facilitating, monitoring and moderating online forums; answering student queries via virtual office hours or help desks, online dialogue and/or phone conversations, providing formative feedback on your work or explaining comments and marking of your prior work.

Students are expected to be familiar with all relevant course content, including materials provided and assessments, and engage appropriately with facilitators within the timeframes provided.

Course Overview

Prerequisite(s)

EEET 1029 UO Electrical and Electronic Systems
MATH 1079 UO Mathematical Methods for Engineers 2

Corequisite(s)

There are no corequisite courses to be completed in conjunction with this course.

Course Aim

To provide students with a firm foundation in electrical DC and AC circuit analysis, and the ability to use computer software for circuit simulation and analysis.

Course Objectives

Refer to the indicators of graduate qualities:http://www.unisa.edu.au/Student-Life/Teaching-And-Learning/Graduate-qualities/Indicators-of-graduate-qualities

On completion of this course, students should be able to:

CO1. Explain the concept of AC circuits, AC power and phasor representation of AC signals.

CO2. Apply various circuit solving techniques and theorems to analyse steady state and transient response of basic electrical circuits.

CO3. Identify circuit transfer function, sketch Bode plots and analyse behaviour of variable frequency circuits.

CO4. Design and perform experiments and apply computer software for circuit modelling and simulation, and for processing and representation of data.

Upon completion of this course, students will have achieved the following combination of Graduate Qualities and Course Objectives:

	GQ1	GQ2	GQ3	GQ4	GQ5	GQ6	GQ7
CO1	•						
CO2	•		•				
CO3	•		•				
CO4	•	•	•				

Course Content

This course will build on the basic principles of electrical and electronic theories. The course will introduce circuit analysis techniques such as nodal analysis, mesh analysis, linearity and superposition techniques, Thevenin and Norton Theorems. The course will introduce second order transients and move into steady state power analysis, magnetically coupled networks and polyphase circuits. Eventuating with exploring variable frequency network performance, frequency response and the relationship of poles zeros on the bode plots. The course will introduce the use of computer-based tools for design and circuit analysis.

Assessment

Assessment Details

Details of assessment submission and return are listed under each assessment task. Assessment tasks will be returned to you within two to three weeks of submission.

Assessment Summary

#	Form of assessment	Length	Duration	Weighting	Due date (Adelaide Time)	Objectives being assessed
1	Continuous assessment	N/A	10 x 20 minute quizzes	30%	*See assessment activities for details*	CO1, CO2, CO3, CO4
2	Assignment	3000 words equivalent	N/A	70%	*See assessment activities for details*	CO1, CO2, CO3, CO4

Feedback proformas

The feedback proforma is available on your course site.

Assessments

1 - Practicals (Graded)

Assessment Activities

Name	Sub-weighting	Due date (Adelaide Time)
Practical 1: Circuit Analysis Techniques	40%	11 Oct 2021, 12:00 PM
Practical 2: Thevenin and Norton	20%	18 Oct 2021, 12:00 PM
Practical 3: Transients	20%	25 Oct 2021, 12:00 PM
Practical 4: Polyphase	20%	22 Nov 2021, 12:00 PM

The practicals will be assessed using four untimed quizzes.

In each practical, you will first calculate expected results for some circuits using the relevant theory for the topic. Then, you will build the circuits in simulation tools, and verify your calculation results. When you are confident in your answers, you can then save your measurements in the quiz for that practical. No time limit applies to the quiz.

PLEASE NOTE: The 10 x 20 minute duration given above for practical quizzes is incorrect. This was changed to allow more time for experimentation - the four quizzes are not timed.

PLEASE NOTE: Re-submission is NOT available for this assessment.

2 - Problem Solving Exercises (Graded)

Assessment Activities

Name	Sub-weighting	Due date (Adelaide Time)
Problem Solving Exercise 1	71%	1 Nov 2021, 12:00 PM
Problem Solving Exercise 2	29%	26 Nov 2021, 5:00 PM

The two Problem Solving Exercises will require you to provide solutions to some questions on the course website. Download the question pages, solve the problems, write your solutions neatly and upload your solutions by the due dates.

Assignment 1 (Problem Solving Exercise 1) will be due on Monday week 7.

Assignment 2 (Problem Solving Exercise 2) will be due on Friday week 10.

Further detail is provided on the Course Website.

PLEASE NOTE: Re-submission is NOT available for this assessment.

Student Support

Support

UniSA Online students have access to a team of dedicated Student Advisers as the first point of contact for non-academic help and support. They can assist you with managing your course enrolments, and refer you to services to assist you with your studies. They are available weekdays until 9pm, and 9am-5pm weekends and most public holidays. You can call (1300 148 812) or live chat via our website (https://online.unisa.edu.au/current-students/student-services/stay-connected/), or simply send an enquiry (http://ask.online.unisa.edu.au/app/ask/) for a response the next day.

Your Online Course Facilitators (OCF) and Online Tutors should be contacted if you have a specific question about your course learning materials and assessments; you can ask via your course discussion forum or email and you can expect to receive a response in 24 hours.

If your UniSA Online OCF or Online Tutor is not available and you need immediate academic literacy assistance, you can contact Studiosity via the link in your course site (Sunday – Friday, 3pm to midnight). You will be connected with a Tutor via live chat within a few minutes. You can also submit a draft written assessment to Studiosity for feedback on structure, grammar and referencing within 24 hours. In addition there is 24/7 IT Support (https://i.unisa.edu.au/askit/) for learnOnline and other UniSA system connections, plus Ask the Library (http://www.library.unisa.edu.au/about-the-library/ask-the-library/) is available via live chat and telephone until midnight on weekdays, and 9am-5pm on weekends.

You can search for information using AskUniSAOnline (http://ask.online.unisa.edu.au/app/ask/), a smart online database of frequently asked questions. The UniSA Online Study Resources site (https://online.unisa.edu.au/current-students/study-resources/) includes guides on referencing, time management, assessments, and academic skills, and can be found in the top menu of your course site, or via the Student Services website (http://online.unisa.edu.au/current-students/student-services/). The Library also provide over 50 online Subject Guides (http://guides.library.unisa.edu.au/subjectguides) to assist you in finding relevant study resources.

Please note all times are for Adelaide (CST).

Course Teaching Staff

Name	Title	Email
Mr Hugh Considine	Online Course Facilitator	UOEEET1028@unisa.edu.au

* Please refer to your Course homepage for the most up to date list of course teaching staff.

Further Assessment Information

Academic Integrity

Academic integrity is the foundation of university life and is fundamental to the reputation of UniSA and its staff and students. Academic integrity means a commitment by all staff and students to act with honesty, trustworthiness, fairness, respect and responsibility in all academic work.

An important part of practising integrity in academic work is showing respect for other people's ideas and being honest about how they have contributed to your work. This means taking care not to represent the work of others as your own. Using another person's work without proper acknowledgement is considered Academic Misconduct, and the University takes this very seriously.

The University of South Australia expects students to demonstrate the highest standards of academic integrity so that its degrees are earned honestly and are trusted and valued by its students and their employers. To ensure this happens, the University has policies and procedures in place to promote academic integrity and manage academic misconduct. For example, work submitted electronically by students for assessment will be examined for copied and un-referenced text using the text comparison software Turnitin http://www.turnitin.com.

It is an offence for any person or company to provide academic cheating services to students of Australian universities, irrespective of whether the service is provided by an Australian or overseas operator (see Tertiary Education Quality and Standards Agency Amendment (Prohibiting Academic Cheating Services) Bill 2019 - https://www.legislation.gov.au/Details/C2020A00078). “Academic cheating services” includes providing or undertaking work for students, where that work forms a substantial part of an assessment task.

More information about academic integrity and what constitutes academic misconduct can be found in Section 9 of the Assessment Policies and Procedures Manual (APPM): http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/. The Academic Integrity Module explains in more detail how students can work with integrity at the University: https://uo.unisa.edu.au/course/view.php?id=225

Important information about all assessment

All students must adhere to the University of South Australia's policies about assessment: http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/.

General Assessment Information

Assessment Extension Request Policy
Extensions to assessment task will follow the University of South Australia Assessment Policies and Procedures Manual (APPM) clause 7.2 - Extension to complete an assessment task. https://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/

All assessment extension requests will be:

- Submitted via the Learnonline site to the Online Course Facilitator prior to the time and date that the assessment item is due and include a reason for the extension request
- Supported with documentary evidence for example, medical certificate

Considerations of unexpected or exceptional circumstances are as per Assessment and Policy Procedure Manual Section 7.7

Once an extension is granted, the extended due date is final.
Requests for an extension greater than 7 days will only be granted under extenuating circumstances and at the discretion of the Online Course Facilitator.

Late Submission of Assignments
Late submission of assignments will result in a penalty. The penalty for late submissions will be:
1. A deduction of 5%, for each day that the assignment is late up to a maximum of 5 days.
2. Assignments which are more than 5 days late will not be marked and will be assigned a zero grade inclusive of non-graded pass work.

Additional assessment requirements

There are no additional assessment requirements identified for this course.

Deferred Assessment or Examination

Deferred assessment or examination is available for this course.

Marking process

Assessments will be marked according to the assessment criteria and standards provided in the Course Outline and relevant Feedback Forms.
Assessments will be returned to students in the timeframe outlined in APPM Section 1.4.4.

Moderation in this course will be carried out in accordance with processes set out in the UniSA Online Moderation Guidelines.

Exam Arrangements

This course does not have an exam.

Supplementary Assessment

Supplementary assessment or examination offers students an opportunity to gain a supplementary pass (SP) and is available to all students under specific conditions unless supplementary assessment or examination has not been approved for the course.

Specific conditions and further information is available in section 7 of the Assessment Policy and Procedures Manual.
http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/

Supplementary Assessment is available to all students in this course under the following conditions:

1. if the student has achieved a final grade between 45-49 per cent (F1) in a course
2. if a student who has successfully completed all of the courses within their program, with the exception of two courses in which they were enrolled in their final study period, a supplementary assessment or examination may be granted where the final grade in either or both of these courses, is less than 45 percent (F1 or F2) and all assessments in the courses were attempted by the student. Supplementary assessment will not be available for a course under investigation for academic integrity until the investigation is completed, and determined that it did not constitute academic misconduct.

More information about supplementary assessment is available in section 7.4 of the Assessment Policy and Procedures Manual. http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/

Successful completion of supplementary assessment or examination will be recorded as a supplementary pass (SP). Failed supplementary assessment or examination will be recorded as a Fail (F). The original fail grade will stand if the student does not sit a supplementary examination or complete the supplementary assessment. The OCF will contact the student in writing with information about the supplementary assessment after the official result release date. Supplementary assessments will be due in the week following result release. https://www.unisa.edu.au/Student-Life/Support-services/Student-administration/Academic-calendars/UniSA-Online/unisa-online-2021/

Variations to assessment tasks

Details for which variation may be considered are discussed in section 7 of the Assessment Policy and Procedures Manual. Variation to assessment in unexpected or exceptional circumstances should be discussed with your course coordinator as soon as possible.

More information about variation to assessment is available in section 7 of the Assessment Policy and Procedures Manual. http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/

Students with disabilities or medical conditions please refer to **Students with disabilities or medical conditions**.

Further Course Information

General Course Information

This course is organised into a 10-week structure. The materials for each week are presented as readings, media presentations and learning tasks for you to complete.

Generally, course content contains 10–12 hours of study material, with the remaining time left for independent study and preparation of assessments. You should consider spending approximately 15 hours per week on this course.

Student Access Plans

Students should contact the Online Course Facilitator in the first week of each course if they believe they may need any adjustments to the course and/or have a current access plan. Adjustments include extending timelines for assessment tasks or predicted absence from course activities. The Access Plan will provide the basis for reasonable accommodations.

Use of recorded material

This course will involve the production of audio and/or video recordings of UniSA students. To protect student privacy, you must not at any time disclose, reproduce or publish these recordings, or related material, in the public domain including online, unless the videoed students give consent for reproduction, disclosure or publication. This requirement is consistent with University statutes, by-laws, policies, rules and guidelines which you agreed to abide by when you signed the Student Enrolment Declaration.

Textbook(s)

There are no textbooks listed for this course.

Course Resources

UniSA Online Academic Literacy Modules

Academic literacy modules have been developed to assist with learning how to research, analyse and communicate according to academic conventions. These academic skills will help you improve your assessment tasks and succeed in your degree. The modules consist of eight self-paced modules of approximately 90 minutes each focused on specific academic skills. You may choose to complete only those modules that focus on topics you feel least confident about or you might set yourself the goal of completing the suite of eight. There is no open or close time to complete these modules, and they will be available to you to revisit throughout your degree.

To study effectively in this course you will require:

- Strong Internet Connection
- Webcam
- Microphone, or
- Headset with Microphone
- Speakers

If you are unsure if you have the necessary requirements, please undertake a Computer System Test.

Reference(s)

Please use the UniSA Harvard Referencing style. A guide to academic referencing can be found on the Study Help site at https://lo.unisa.edu.au/course/view.php?id=3839

Students with disabilities or medical conditions

Students with disabilities or medical conditions or students who are carers of a person with a disability may be entitled to a variation or modification to standard assessment arrangements. See Section 7 of the Assessment Policy and Procedures Manual (APPM) at: http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/

Students who require variations or modifications to standard assessment arrangements should make contact with their Online Course Facilitator as early as possible in order to ensure that appropriate supports can be implemented or arranged in a timely manner.

Students can register for an Access Plan with UniSA Access & Inclusion Service. It is important to make contact early to ensure that appropriate support can be implemented or arranged in a timely manner. See Access and Inclusion for more information: https://i.unisa.edu.au/students/student-support-services/access-inclusion/

Students are advised there is a deadline to finalise Access Plan arrangements for examinations. Further information is available at: http://i.unisa.edu.au/campus-central/Exams_R/Before-the-Exam/Alternative-exam-arrangements/

Special Consideration

Special consideration is available for this course.

Action from previous evaluations

This is the first UniSA Online offering of a course that has been delivered on-campus for several years. The on-campus course was restructured to allow a greater focus on circuit analysis techniques, and new practicals with a clearer step-by-step instructions were added.

Your suggestions for future study periods are welcome - you will be emailed myCourseExperience surveys at the end of the course. Please complete the surveys, and we will carefully read your comments.

Unplanned learnonline outages

The alteration to assessment due dates and communication strategy is designed to minimise the impact of major unplanned learnonline system service outages on students and staff. They should only be considered when an unplanned outage occurs within 3 days of an assessment activity.
Any implementation or revisions are at the discretion of the Online Course Facilitator.

Outage Duration	Alteration to due date	Alteration to examination
Less than 1 hour	Nil impact	Nil impact
Between 1 and 4 hours	consider extension	Nil impact
Between 4 and 24 hours	24 hour extension	Consider when marking
Longer than 24 hours	48 hour extension	Consider when marking

Any changes to assessment activity will be communicated to you from your Online Course Facilitator via:

- Email
- learnonline forum post in the Announcements forum

Course Calendar

Study Period 6 - 2021

	Weeks	Topic	Assessment Details (Adelaide Time)	Public Holidays
1	20 - 26 September	Nodal Analysis		
2	27 September - 3 October	Mesh (Loop) Analysis		
3	04 - 10 October	Linearity and Superposition		Labour Day 04 Oct 2021
4	11 - 17 October	Thêvenin's and Norton's Theorems	Practicals: Practical 1: Circuit Analysis Techniques due 11 Oct 2021, 12:00 PM	
5	18 - 24 October	First and Second Order Transients	Practicals: Practical 2: Thevenin and Norton due 18 Oct 2021, 12:00 PM	
6	25 - 31 October	Steady State Power Analysis	Practicals: Practical 3: Transients due 25 Oct 2021, 12:00 PM	
7	01 - 7 November	Steady State Power Analysis (cont.)	Problem Solving Exercises: Problem Solving Exercise 1 due 01 Nov 2021, 12:00 PM	
8	08 - 14 November	Magnetically Coupled Circuits		
9	15 - 21 November	Variable-Frequency Networks		
10	22 - 28 November	Frequency Response, Poles and Zeros, Bode Plots	Problem Solving Exercises: Problem Solving Exercise 2 due 26 Nov 2021, 5:00 PM Practicals: Practical 4: Polyphase due 22 Nov 2021, 12:00 PM	