

Undergraduate Program Subject Outline

School of Engineering

SUBJECT NAME: CIRCUITS AND SYSTEMS

Course code:	ECTE202	Section:	Dubai
Credit Points:	6	Year	2025
Session	Winter	Duration:	11 weeks
Pre-requisite(s)	ENGG104 and MATH142	Co-requisite(s)	None
Mode of Delivery:	FTF		
Final Exam Passing Requirement:	40%		

Timetabling Information can be found at MY|UOWD, <https://my.uowdubai.ac.ae/>

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Consultation:	See Moodle		

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1 SUBJECT DESCRIPTION

Topics covered in this subject include: dependent sources; circuit analysis techniques; generalised and complex impedance; energy storage elements L, C; natural, forced and complete response of first and second order circuits; phasors; frequency response; Bode plots; Laplace Transform and Fourier series; and magnetically coupled circuits.

2 CONTRIBUTION TO PROGRAM LEARNING OUTCOMES (PLO)

The activities in this course contribute to achieving the following program learning outcomes:

Program: Engineering	
PLO1	Demonstrate professional knowledge with a strong grounding in engineering and awareness of current local and international trends and challenges.
PLO2	Navigate disciplinary literature with particular skills in gathering & synthesising information independently to support an argument or strategy.

PLO3	Implement common research methods in the field of engineering, analyse data & evaluate the validity of findings and exercise critical judgement in determining new directions and strategies for carrying out further investigation.
PLO4	Draw from established engineering concepts, methods and industry standards to develop innovative solutions to complex engineering problems by completing a research project relating to the respective engineering major.
PLO5	Communicate clearly and coherently in writing to a range of audiences, with an ability to integrate knowledge, research, data, analysis and critical evaluation.
PLO6	Communicate verbally to a range of audiences using appropriate language in presentations, consultation and negotiation.
PLO7	Work productively as part of a team with the capacity for leadership, recognising the roles, responsibilities and accountabilities of team members.
PLO8	Show respect for the views, values and culture of others in settings involving colleagues, clients, communities and end users, and consider alternate perspectives in design and project management.
PLO9	Make complex considerations in regards to professional ethics and accountability, account for and mitigate risk, and operate with a commitment to professionalism in all work.
PLO10	Appreciate the importance of sustainable engineering design, and seek to maximise positive social and environmental outcomes in engineering design, practice and development.

	Course ECTE202 Upon successful completion of this subject, a student should be able to	PLOs
LO1	Use circuit theorems in analysing networks with mixed sources	1
LO2	Analyse the transient and steady state response of circuits	1
LO3	Analyse AC circuits using phasor methods and determine the frequency response of the circuits.	1
LO4	Analyse circuit dynamics using Laplace and Fourier Techniques.	1

3 SUBJECT SCHEDULE

3.1 LECTURE SCHEDULE

Week	Lecture Topic(s)	Learning outcomes	Session Type	Delivery Format	Related supporting materials	Assessment Formative (F) Summative (S)
Week 1	Node Analysis and mesh analysis (including dependent sources)	LO1	Workshop	FTF	Moodle and Book Materials	
Week 2	Energy Storage Elements - First Order Circuits (natural response, forced response, complete response).	LO2	Workshop	FTF	Moodle and Book Materials	Class Test 1 (S)
Week 3	Second Order Circuits (source-free series RLC, source-free parallel RLC)	LO2	Workshop	FTF	Moodle and Book Materials	
Week 4	Second Order Circuits (step response of series and parallel RLC)	LO2	Workshop	FTF	Moodle and Book Materials	Class Test 2 (S)
Week 5	Sinusoidal Steady-State circuit analysis	LO3	Workshop	FTF	Moodle and Book Materials	Midterm Exam (S) (1hr) (during the last hour of workshop)
Week 6	AC circuit Frequency Response (transfer functions, Bode plots)	LO3	Workshop	FTF	Moodle and Book Materials	
Week 7	Three-Phase Circuit Analysis; Complex Power, Voltage, and Current	LO3	Workshop	FTF	Moodle and Book Materials	Class Test 3 (S)

Week 8	Magnetic Coupling Circuit	LO4	Workshop		Moodle and Book Materials	
Week 9	Laplace Transforms and Applications	LO4	Workshop	FTF	Moodle and Book Materials	
Week 10	Fourier Series	LO4	Workshop	FTF	Moodle and Book Materials	Class Test 4 (S)
Week 11	Revision		Workshop	FTF	Moodle and Book Materials	

3.2 LABORATORY SCHEDULE

Week	Computer Lab Activities	Learning Outcomes
2	Lab 1: Nodal and Mesh Analysis	1
4	Lab 2: First-order Circuits	1,2
6	Lab 3: Second-order Circuits	1,2
8	Lab 4: Transfer Functions and Bode Plots	3
10	Lab 5: Laplace Transform	4

4 SUPPORTING MATERIALS

Books, Articles, Videos, Podcasts, etc. will be available on our Learning Management System (LMS).

4.1 REQUIRED TEXTBOOK

Alexander and Sadiku, Fundamentals of Electric Circuits, 7th (2021) Edition, McGraw Hill publishers.
[h tps://www.mheducation.com/highered/product/fundamentals-electric-circuits-alexander-sadiku/M9781260226409.html](https://www.mheducation.com/highered/product/fundamentals-electric-circuits-alexander-sadiku/M9781260226409.html).

4.2 RECOMMENDED READINGS

Nilsson and Riedel, Electric Circuits, 11th (Global) Edition, 2021, Pearson Education Limited.
[h tps://www.pearson.com/en-us/subject-catalog/p/electric-circuits/P200000003467/9780137477845](https://www.pearson.com/en-us/subject-catalog/p/electric-circuits/P200000003467/9780137477845)

4.3 ACCESS TO SUPPORTING MATERIALS

The University uses MOODLE as a Learning Management System (LMS) to support all coursework subjects. The subject site and supporting materials can be accessed via:
[h tps://moodle.uowplatform.edu.au](https://moodle.uowplatform.edu.au) And via UOWD Library.

5 ASSESSMENT

5.1 ASSESSMENT OF LEARNING OUTCOMES

Learning Outcome	Measures (Elements of Assessment)
LO1	Class Test, Labs, Mid-term examination, Final examination
LO2	Class Test, Labs, Mid-term Examination, Final examination
LO3	Class Test, Labs, Final examination
LO4	Class Test, Labs, Final examination

5.2 ASSESSMENT TASKS

Learning Outcome	Assessment 1 Class Test 10%	Assessment 2 Labs 25%	Assessment 3 Mid-term Examination 20%	Assessment 4 Final Exam 45%
LO 1	x	x	x	x
LO 2	x	x	x	x
LO 3	x	x		x
LO 4	x	x		x
Group (G)/ Individual (I)	I	I/G	I	I
Total Marks	10	25	20	45
Due Date	Weekly	Bi-Weekly	Week6	During Final exam period

Assessment Task:	Class Tests
Type:	Individual
Description:	Report
Learning Outcome Measured:	1, 2, 3, 4
Total Marks:	10
Weighting:	10
Due Date:	Before tutorial of the next week
Hand in to:	Submitted on Moodle

OUTLINE AND REQUIREMENTS

There are four class tests throughout the semester. These tests are closed-book assessments and are completed individually. Write-on exam involving, problem-solving, short answer type questions, and calculations, assessment is based on the correctness of answering the questions

MARKING CRITERIA

Refer to the class test document for the marking criteria of each class test.

Assessment Task:	Labs
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Type:	Individual and Group
Learning Outcome Measured:	1, 2, 3, 4
Total Marks:	25
Weighting:	25

OUTLINE AND REQUIREMENTS

There will be 5 biweekly laboratory sessions. Students are expected to submit individual reports after each lab session. Method of submission: In lab, soft copy or online as requested within the deadline. There will be a group project allocated during the laboratory session, and a deadline to work on them will be provided. Demonstration and submission of required resources will be announced during the session.

MARKING CRITERIA

Participation will be assessed in this subject via the completion of the lab task and the submission of the lab assignments. These may be based on the weekly lab questions posted on Moodle, or additional problems provided during the lab classes. Depending on the particular problem, the solutions may be required to be submitted as hard copies or as a soft copy solution. The marks will be allocated for the biweekly participation and lab projects. The marks will be awarded based on participation and on solution correctness.

Assessment Task:	Mid-term Examination
Type:	Individual
Learning Outcome Measured:	1, 2
Total Marks:	20
Weighting:	20
Date, Time and Location:	Week 6

OUTLINE AND REQUIREMENTS

The syllabus for midterm examination will be the content covered from Week 1 to Week 4. Written examination involving problem solving, multiple-choice questions (MCQ) and long answer type questions and calculations. Assessment is based on the correctness of answering the questions.

MARKING CRITERIA

Refer to the mid-term exam booklet for marking criteria.

Assessment Task:	Final Exam
Learning Outcome Measured:	1, 2, 3, 4
Total Marks:	45
Weighting:	45

Date:	To be held during the official examination period. Please refer to the Exam Timetable available on the Student Online Resources website (http://my.uowdubai.ac.ae) closer to the exam period.
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LATE SUBMISSIONS:

Please note that late submissions will incur a penalty of 20% per day, including weekends.

5.3 GRADES AWARDED

The approved grades of performance and associated ranges of marks for undergraduate subjects are:

High Distinction (HD)	85 – 100%
Distinction (D)	75 – 84%
Credit (C)	65 – 74%
Pass (P)	50 – 64%
Pass Supplementary (PS)	50%
Fail (F)	0 – 49% (and not meeting the attendance requirements)
Technical Fail (TF)	Not meeting the final exam passing requirements – see the Assessment Policy PP-REG-DB-2.1

5.4 SATISFACTORY COMPLETION REQUIREMENTS

In order to be considered for a grade of Pass (P) or better in this subject, students must achieve the minimum required mark in the Final Examination (see page 1 for required score); students who obtain a composite mark greater than or equal to 50% but do not satisfy the Final Examination minimum pass requirements in the final examination will be awarded a “Technical Fail” grade.

Students must ‘reasonably’ complete all assessment tasks (including the required score for the Final Examination,) and submit these as specified in the subject outline. ‘Reasonable’ completion of an assessment task will be determined based on the instructions given to the student including: word length, demonstration of research and analysis where required, adherence to the Plagiarism Policy guidelines, and completion of each section/component of the assessment. Failure to submit all assessment tasks may result in a Fail grade awarded for the subject.

6 RELEVANT POLICIES AND DOCUMENTS

All students must read and be familiar with the following UOWD policies and documents, which are available on the Student Online Resources (my.uowdubai.ac.ae) website by following the Policies link:

- Academic Grievance Policy
- Academic Integrity Policy
- Campus Access and Order Rules
- Code of Conduct – Library Users
- Code of Practice – Students
- Copyright Policy
- Intellectual Property Policy
- Library Regulations
- Minimum Rate of Progress
- Music, Video and Software Piracy
- Non-Discriminatory Language and Practice & Presentation Policy and Guidelines
- Special Consideration Policy & Procedure
- Student Attendance Policy

- Student Conduct Rules
- Rules for use of UOWD ITTS Facilities
- Teaching and Assessment: Code of Practice – Teaching
- Teaching and Assessment: Assessment and Feedback Policy
- Teaching and Assessment: Subject Delivery Policy

7 SSP & STUDIOSTY

SSP (Student Support Program) is a program committed to assisting students in developing their academic skills and getting the most out of their studies. As part of their services, SSP provides Peer Tutoring Program and Academic Workshops (<https://my.uowdubai.ac.ae/ssd/index.php>).

Studiosity is an online study tool that students can access 24 hours, 7 days a week! Students can receive feedback on submitted writing in less than 24 hours and receive one-to-one, personal help in real time with a subject specialist. The service can be accessed through the subject's Moodle site.

For further information, please contact:

SSP Coordinator

ssp@uowdubai.ac.ae

Phone Number: +971 4 278 1756

8 ACADEMIC INTEGRITY

Plagiarism and cheating are serious offences that can lead to expulsion from the university. Students must be familiar with the *Academic Integrity* policy which outlines the procedure that will be followed in case of academic misconduct including cheating and plagiarism. Please refer to *How to Avoid Plagiarism* available on the Student Online Resources website (<http://my.uowdubai.ac.ae>).

8.1 TURNITIN

Students are required to submit all written assignments in soft copy through the TurnItIn system which is available online at www.turnitin.com. Every student must have a TurnItIn account. Failure to submit an assignment through TurnItIn will result in marks for that assignment being withheld. **Students do NOT need to hand in a printed copy of the TurnItIn Originality Report.** More information about TurnItIn (including how to create an account and add a class) will be provided in the first lecture. Students can download Frequently Asked Questions (FAQs) about TurnItIn from the SSP section of UOWD website (<https://www.uowdubai.ac.ae/academic-resources/student-support-programs>).

TurnItIn information required to add this subject:

Class ID:	Moodle Link
Password:	Moodle Link

8.2 REFERENCE & IN-TEXT CITATION

For information about referencing and in-text citation please review the *Academic Writing Presentation* available on the Student Online Resources website (<http://my.uowdubai.ac.ae>).

8.3 UOWD RULES & POLICIES

For information about UOWD Rules and Policies, please go to the Student Online Resources website (<http://my.uowdubai.ac.ae>) and click on the POLICIES link.

9 ATTENDANCE REQUIREMENTS

Attendance in this subject is compulsory. Failure to attend all tutorials and computer labs as per the Student Attendance Policy may result in a FAIL grade. Students are strongly encouraged to become familiar with this policy (which can be found on the Online Resources website at my.uowdubai.ac.ae).

10 TUTORIAL/COMPUTER LAB ENROLMENTS

All students must sign up for one tutorial and/or computer lab in Week 1. Admission to a tutorial/computer lab will not be possible unless the student's name is on the Attendance List for that class. No changes will be allowed once a student has enrolled in a tutorial/computer lab.

11 SUPPLEMENTARY ASSESSMENTS

A supplementary assessment may be offered to students whose performance in this subject is close (45-49 in the final examination and 48-49 in the composite score) to that required to pass the subject, and are otherwise identified as meriting an offer of a supplementary assessment. The precise form of a supplementary assessment will be determined at the time the offer of a supplementary is made.

12 LECTURE CAPTURE

UOWD supports the recording of lectures as a supplemental study tool, to provide students with equity of access, and as a technology-enriched learning strategy to enhance the student experience.

To make your own recording of a lecture you must receive the explicit permission of the Educator and those people who are also being recorded.

You may only use recorded lectures, whether they are your own or recorded by the university, for your own educational purposes. Recordings cannot be altered, shared or published on another platform, without permission of the University. UOWD's Lecture Capture policy is underdevelopment.

13 SUSTAINABILITY

UOWD encourages all students to act in a sustainable manner when planning and submitting assessments. If possible, students should not use plastic items, such as folders, covers, and bindings, and other synthetic materials, for presentations, workshops, and other activities. Students are also encouraged to avoid unnecessary printing; and if printing is required, please consider printing double-sided and only printing essential illustrations avoiding blocks of any colour as the use of ink is harmful to the environment. Always behave in a sustainable way.