



Course Specification

— (Bachelor)

Course Title: Electrical Circuits
Course Code: CEN1301
Program: Bachelor in Computer Engineering
Department: Computer Engineering
College: Faculty of Computers and Information Technology
Institution: University of Tabuk
Version: 1.0
Last Revision Date: 27 July 2022



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A. General information about the course:

1. Course Identification

1. Credit hours: (4)

2. Course type

- A. University College Department Track Others
- B. Required Elective

3. Level/year at which this course is offered: (5/3)

4. Course general Description:

This course is designed to provide a complete overview of DC and AC electric circuit analysis used in computer engineering. Electric circuit analysis is the most fundamental concept for electrical, electronics, and computer engineering. Topics include; resistance, voltage, current, Ohm's Law, Kirchhoff's Laws, power, superposition, network theorems, Thevenin's and Norton's Theorems, maximum power transfer, introduction to AC, capacitors and inductors.

5. Pre-requirements for this course (if any):

General Physics - PHYS1251

6. Co-requisites for this course (if any):

N/A

7. Course Main Objective(s):

1. Understand fundamental electric quantities: voltage, current, electric power, and energy.
2. Differentiate between dependent and independent voltage and current sources.
3. Analyze DC and AC Circuits, and calculate the circuit's parameters.
4. Understand time-varying voltage and current and appreciate sinusoidal signals in AC circuits.
5. Understand three-phase AC circuits and calculate the circuit's parameters and the three-phase systems.
6. Apply the source transformation and Y- Δ transformation to simplify circuits.



7. Understand the concepts of power factor, complex power, and conservation of power.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	E-learning		
3	Hybrid <input type="radio"/> Traditional classroom <input type="radio"/> E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		75

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognize and define the voltage-current characteristics of different circuit elements (passive and active), as well as different theories that	K1	Lectures, Lab sessions	Class Works, Assignments, Exams, Lab work.





Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
	can be applied to the electric circuits.			
1.2	State the basics of electrical circuits and their engineering applications.	K4, K5	Lectures, sessions Lab	Exams, Lab work.
2.0	Skills			
2.1	Evaluate the different theories used in solving the electrical circuits.	S1	Lectures, sessions Lab	Class Works, Assignments, Exams, Lab work.
2.2	Explain the differences between active, reactive, and apparent power.	S2	Lectures, sessions Lab	Class Works, Assignments, Exams, Lab work.
2.3	Analyze the electrical circuits into simple circuits using circuit reduction techniques and network theorems.	S1	Lectures, sessions Lab	Class Works, Assignments, Exams, Lab work.
3.0	Values, autonomy, and responsibility			
3.1	N/A			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction. Lab: Introduction to The Electrical Laboratory.	5
2.	Fundamental electric quantities: voltage, and current. Lab: Resistor Color Code.	5
3.	Ohm's Law, Electric power and energy. Lab: Ohm's Law.	5
4.	Independent and dependent sources. Lab: DC Sources and Metering.	5
5.	Resistance, capacitance, and inductance. Lab: Capacitance, and inductance.	5
6.	Methods of Network Analysis (DC). Lab: Series DC Circuits.	5
7.	Series parallel and combination DC Circuits (part 1). Lab: Parallel DC Circuits.	5
8.	Series parallel and combination DC Circuits (part 1). Lab: Series-Parallel DC Circuits.	5
9.	Network Theorems (DC). Lab: Superposition Theorem.	5
10.	Sinusoidal Alternating Waveforms. Lab: Oscilloscope.	5





11.	The Basic Elements and Phasors. Lab: Spectrum analyzer.	5
12.	Methods of Network Analysis (AC). Lab: Network Analysis.	5
13.	Series parallel and combination AC Circuits (part 1). Lab: Series-Parallel AC Circuits.	5
14.	Series parallel and combination AC Circuits (part 1). Lab: Series-Parallel AC Circuits.	5
15.	Network Theorems (AC). Lab: Network Theorems.	5
Total		75

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Class works, Assignments, Quizzes	2,15	10%
2.	Lab work	2,15	20%
3.	First Midterm Exams.	6 or 7	15%
4.	Second Midterm Exams.	11 or 12	15%
5.	Final Exam	16	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Charles Alexander Matthew Sadiku, Fundamentals of Electric Circuits, 7/E, McGraw Hill, 2020, ISBN-10: 1260226409, ISBN-13: 978-1260226409
Supportive References	LAB Manual.
Electronic Materials	Faculty member's sites Saudi Digital Library (SDL) (www.sdl.edu.sa)
Other Learning Materials	TBA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, laboratory
Technology equipment (projector, smart board, software)	White board, Data show projector
Other equipment (depending on the nature of the specialty)	TBA



F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Teaching	Faculty, Program Leaders, and Advisory Board	Both Direct and Indirect
	Students	Indirect
Effectiveness of Students Assessment	Faculty, Program Leaders, Advisory Board, and Independent Opinion	Both Direct and Indirect
Quality of Learning Resources	Faculty, Students, and Advisory Board	Indirect
The Extent to which CLOs have been Achieved	Faculty, Program Leaders, Advisory Board, and Independent Opinion	Direct (as in section B) and Indirect/Surveys
	Students	Indirect
Other	-	-

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

