COURSE PLAN

FIRST: BASIC INFORMATION

College	
College	: Karak College
Department	: Engineering Department.

Course	
Course Title	: Electronic Circuit II
Course Code	:20406212
Credit Hours	: 2 (1 Theoretical, 1 Practical)
Prerequisite	: 20406211

Instructor					
Name	:				
Office No.	:				
Tel (Ext)	:				
E-mail	:				
Office Hours	:				
Class Times					

Text Book
Electronic Circuit II, Al-Balqa Applied University & KOICA, 2022.

References

- Adel Sedra et al., "**Microelectronic Circuits**" 8th Ed., Oxford University Press, 2019
- Mahmood Nahvi and Joseph Edminister, "**Schaum's Outline of Electric Circuits**" 7th Ed., McGraw-Hill, 2017.
- Robert Boylestad, "**Electronic Devices and Circuit Theory**" 11th Ed., Pearson, 2014.

SECOND: PROFESSIONAL INFORMATION

COURSE DESCRIPTION

This course explains the characteristics and operations of advanced circuits with common electronic components. The advanced circuits include operational amplifiers, oscillators, regulators, filters, signal generators, etc., which are widely used in electronic equipment.

COURSE OBJECTIVES

The objectives of this course are to enable the student to do the following:

- Explain the theory of differential amplifier, basic and applied circuit of operational amplifier.
- Explain the current and voltage values in op-amp circuits.
- Explain the characteristics and operations of active filters
- Explain the characteristics and operations of sine and non-sine wave generator.

- Explain PLL circuit, modulation/demodulation circuit.

COURSE LEARNING OUTCOMES

By the end of the course, the students will be able to:

CLO1. Analyze the work of Op-Amp and determine its characteristics
CLO2. Determine the circuits and the actual operation of the amplifier
CLO3. Determine current and voltage values for op-amp circuits
CLO4. Explain the components of oscillators, their working principle, and their construction methods
CLO5. Examine the voltage regulator circuits and their working methods
CLO6. Explain how to build filters
CLO7. Determine the types of filters and the application of each type
CLO8. Determine the types of signal generators and their uses
CLO9. Determine the methods of generating sinusoidal signals and know their characteristics and uses

COURSE SYLLABUS

Week	topic	Topic details	Related LO	Proposed assignments
1	Operational amplifier	• The Op-Amp Terminals. • Function and Characteristics of the Ideal Op Amp. • Differential and Common-Mode Signals.	CLO1	
2	Operational amplifier	• The Inverting op-amp Closed-Loop Gain. • Effect of Finite Open-Loop Gain on Inverting op-amp. • Inverting op-amp Input and Output Resistances. • The Weighted Summing Op-Amp	CLO2	
3	Operational amplifier	• Noninverting Configuration Closed-Loop Gain. • Noninverting op-amp Effect of Finite Open-Loop Gain. • Noninverting op-amp Input and Output Resistance. • The Voltage Follower.	CLO2	
4	Operational amplifier	• A Single-Op-Amp Difference Amplifier. • A Superior Circuit: The Instrumentation Amplifier. • The Op-Amp Integrator. • The Op-Amp Differentiator.	CLO3	
5	Oscillators and timers	• Sinusoidal Oscillators Feedback Loop. • The Oscillation Criterion. • Analysis of Oscillator Circuits. • Nonlinear Amplitude Control.	CLO4	
6	Oscillators and timers	• The Wien-Bridge Oscillator. • The Phase-Shift Oscillator. • The Quadrature Oscillator.	CLO4	

Week	topic	Topic details	Related LO	Proposed assignments
		• The Active-Filter-Tuned Oscillator.		
7	Regulator and power supplies	• Voltage regulator • Zener diode as a regulator • Operational characteristics of Zener diode	CLO5	
8		**Mid exam**		
9	Regulator and power supplies	• Discrete Transistor Voltage Regulation. • IC Voltage Regulators. • Practical Applications.	CLO5	
10	Filters	• Filter Transmission. • Filter Types. • Filter Specification. • Obtaining the Filter Transfer Function: Filter Approximation.	CLO6	
11	Filters	• Obtaining the Filter Circuit: Filter Realization. • The Filter Order. • The Filter Poles. • The Filter Transmission Zeros. • All-Pole Filters.	CLO6	
12	Filters	• First-Order Filter. • Second-Order Filter. • The Butterworth Filter. • The Chebyshev Filter.	CLO7	
13	Filters	• The Antoniou Inductance-Simulation Circuit. • The Op Amp–RC Resonator. • Realization of the Various Filter Types.	CLO7	
14	Wave generator	• The Bistable Feedback Loop. • Transfer Characteristic of the Bistable Circuit. • Triggering the Bistable Circuit. • The Bistable Circuit as a Memory Element. • A Bistable Circuit with Noninverting Transfer Characteristic.	CLO8	
15	Wave generator	• Generating Square Waveforms Using a Bistable Circuit. • Generating Triangular Waveforms. • Generation of Sine Waves.	CLO9	
16		**Final exam**		

COURSE LEARNING RESOURCES

Teaching will be achieved using available resources including lectures, data show, and materials uploaded on the e-learning system.

ONLINE RESOURCES

- · https://www.electronics-tutorials.ws/
- · https://www.allaboutcircuits.com/textbook/

ASSESSMANT TOOLS

Assessment Tools	%
Projects and Quizzes	20%
MID Exam	30%
Final Exam	50%
Total Marks	100%

THIRD: COURSE RULES

ATTENDANCE RULES

Attendance and participation are extremely important, and the usual University rules will apply. Attendance will be recorded for each class. Absence of 10% will result in a first written warning. Absence of 15% of the course will result in a second warning. Absence of 20% or more will result in forfeiting the course and the student will not be permitted to attend the final examination. Should a student encounter any special circumstances (i.e. medical or personal), he/she is encouraged to discuss this with the instructor and written proof will be required to delete any absences from his/her attendance records.

GRADING SYSTEM
Example:

Grade	points
-	

REMARKS

{The instructor can add any comments and directives such as the attendance policy and topics related to ethics}

COURSE COORDINATOR

Course Coordinator: Eng.mahmoud aljafari   Department Head:

Signature: Eng.mahmoud aljafari   Signature:

Date: Date: