



**Ministry of Higher Education and Scientific Research**  
**Scientific supervision and evaluation device**  
**Department of Quality Assurance and Academic Accreditation**  
**Accreditation Department**

# **Academic program and course description guide**

**2024**

## **Introduction:**

**The educational program is considered a coordinated and organized package of academic courses that includes procedures and experiences organized in the form of academic vocabulary, the main purpose of which is to build and refine the skills of graduates, making them qualified to meet the requirements of the labor market. It is reviewed and evaluated annually through internal or external audit procedures and programs such as the external examiner program.**

**The description of the academic program provides a brief summary of the main features of the program and its courses, indicating the skills that students are working to acquire based on the objectives of the academic program. The importance of this description is evident because it represents the cornerstone of obtaining program accreditation, and the teaching staff participates in writing it under the supervision of the scientific committees in the scientific departments.**

**This guide, in its second edition, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the latest developments in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, quarterly), in addition to adopting the description of the academic program circulated according to the book of the Department of Studies 3/2906. On 5/3/2023 with regard to programs that adopt the Bologna Process as a basis for their work.**

**In this area, we can only emphasize the importance of writing descriptions of academic programs and courses to ensure the smooth conduct of the educational process.**

## **Concepts and terminology:**

**Description of the academic program:** The description of the academic program provides a brief summary of its vision, mission, and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a necessary summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he or she has made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be a developed, inspiring, motivating, realistic and applicable programme.

**The program's mission:** It briefly explains the goals and activities necessary to achieve them, and also defines the program's development paths and directions.

**Program objectives:** These are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum structure:** All courses/study subjects included in the academic program according to the approved learning system (semester, annual, Bologna track), whether it is a requirement (ministry, university, college, or scientific department), along with the number of study units.

**Learning outcomes:** A consistent set of knowledge, skills, and values that the student has acquired after the successful completion of the academic program. The learning outcomes for each course must be determined in a way that achieves the program objectives.

**Teaching and learning strategies:** They are the strategies used by the faculty member to develop the student's teaching and learning, and they are plans that are followed to reach the learning goals. That is, it describes all curricular and extracurricular activities to achieve the learning outcomes of the programme.

## Academic program description form

**University name:** Middle Technical University

**College:** Technical Institute/Kut

**Scientific Department:** Department of Medical Device Technologies

**Name of the academic or professional program:** Technical diploma

**Name of the final certificate:** Technical Diploma in Electronic Technologies, Medical Devices Branch

**Academic system:** first and second semester of the 2023-2024 academic year

**Description preparation date:** 2/20/2024

**Date of filling the file:** 2/20/2024

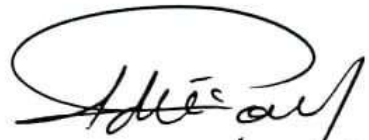
**The signature:**



**Name of Department Head:** Dr. Raad Farhood Chisab

**Date:** 2/21/2024

**The signature:**



**Name of scientific assistant:** Adil Al-Oghele

**Date:** 17/3/2024

**Check the file by**

**Division of Quality Assurance and University Performance**

**Name of the Director of the Quality Assurance and University Performance Division:**

**The date:**

2/17

**The signature:**



**Authentication of the Dean**

17/3/2024

الاستاذ الدكتور  
مهدي فرحان بليتر  
عميد المعهد التقني، كوت

### 1. Program structure

Program structure	Number of courses	Study unit	Percentage	comments *
Enterprise requirements	18	54	33.33%	
College requirements				
Department requirements	18	54	33.33%	
Summer training				
Other				

### 2. Program vision

Promoting to a distinguished and innovative department in teaching and training all medical device technologies at a high level of quality that contributes to the qualification of highly qualified national human cadres. The ambition is for the department to be a pioneer in providing educational and specialized programs in the field of medical device technologies and to be a model to be emulated at the local and global levels.

### 3. Program accreditation

\* **Does the program have program accreditation? From which side?**

Applications for program accreditation will be submitted in the coming months

### 4. Other external influences

**Is there a sponsor for the program?**

Nothing

Notes may include whether the course is core or elective

## 2. Program message

- Preparing graduates with high professional skills and ethics.
- Instilling in the student the spirit of acquiring knowledge to serve the needs of society.
- Educational guidance and consolidation of national identity.
- Community service by providing specialized training courses in the field of maintenance and development of medical devices.

## 3. Program Goals

- Introducing the student to the most important foundations and principles of medical device technology.
- Introducing the student to the main and secondary technical functions.
- Explaining the development of technological sciences and their historical sequence.
- Explaining the importance of studying device technologies and their role in maintaining and developing various medical devices in the health sectors.
- Providing the student with various topics on medical device technologies and forming a knowledge base for him on methods of maintaining and developing them and areas of their applications.
- Qualifying the student to obtain a technical diploma in electronic technology/medical devices branch, enabling him to work in the public and private sectors as a technician.
- Preparing research and studies within the specialty

## 4. Program description

Year/level	Name of the course or course	Course or course code	Credit hours	
			Theoretical	Practical
2023-2024/ Course 1	Electronic 1		2	2
2023-2024/ Course 1	Digital circuits 1		2	2
2023-2024/ Course 1	Electrical circuits and measurements 1		2	2
2023-2024/ Course 1	Parameter 1		-	4
2023-2024/ Course 1	mathematics		2	-
2023-2024/ Course 1	Calculator applications		2	2
2023-2024/ Course 1	Engineering and electrical drawing		-	3
2023-2024/ Course 1	Physiology1		2	-
2023-2024/ Course 1	human rights		2	-
2023-2024/ Course 1	Arabic		1	-
2023-2024/ Course 2	Electronic 2		2	2
2023-2024/ Course 2	Digital circuits 2		2	2
2023-2024/ Course 2	Electrical circuits and measurements 2		2	2
2023-2024/ Course 2	English		1	-
2023-2024/ Course 2	Physiology2		2	-
2023-2024/ Course 2	Mechanical workshops		-	4

## 5. Expected learning outcomes of the program

### Knowledge

- 1- To know the most important basic technical principles and concepts in installing, operating and maintaining various medical devices.
- 2- To determine the main functions of medical devices and secondary functions.
- 3- To explain the concepts of medical device technology.
- 4- To apply technical concepts with realistic examples and case studies.
- 5- Maintenance and development of medical devices

### Skills

- 1 - Interaction skills: Possessing the ability to communicate with the subject professor and colleagues.
- 2 - Diagnostic skills: the ability to diagnose medical device technologies and their real-world applications.
- 3 - Analytical skills: the ability to analyze technical concepts and the relationships between them.

### Value

Developing students' abilities to share ideas

## 6. Teaching and learning strategies

- 1 - Using the lecture method and the active participation of students.
- 2- Use the question and answer method.
- 3- Students' participation in presenting ideas.

## 7. Evaluation methods

Tests (monthly, quarterly, final).

8. The teaching staff							
Faculty members							
Scientific rank	The Name	Specialization		Special requirements/skills (if any)		Preparing the teaching staff	
		General	Private			Perpetual angel	lecturer
Assistant Professor Dr	Raad Farhoud Jasb	Electricity Engineering	Electronics and communications			✓	
Teacher	Bahaa Karim Muhammad	computer Sciences	Information systems			✓	
assistant teacher	Ammar Alaa Majeed	Electricity Engineering	General electricity			✓	
assistant teacher	Dargham Karim Gharkan	computer Sciences	Cyber security			✓	
Doctor teacher	Haider Abdul Jabbar Bahr	Arabic Language	language				✓

### Professional development

#### Orienting new faculty members

Directing teaching professors to the necessity of participating in holding important courses and workshops that will develop and advance the department among the ranks of distinguished departments.

#### Professional development for faculty members

Involving new teachers, as they are the infrastructure for building the department's future, in courses and workshops to develop skills and encourage innovation in the service of the educational process.



### **9. .Acceptance criterion**

**1 – Central through admission lists issued by the Ministry of Higher Education and Scientific Research.**

**2 – Direct submission by applying for the evening study.**

### **10.The most important sources of information about the program**

- Scientific department
- Register
- Subject teacher

### **11.Program development plan**

Holding courses and workshops for the department staff that will develop skills and capabilities, encourage scientific innovation, and participate in scientific exhibitions at the university and country levels for teachers on the one hand and students on the other hand, so that the department is among the distinguished departments at the institute and university levels.



## Course description form

1. Course name: Electronic

2. Course code

3. Semester/Year: The first and second semester of the academic year 2023-2024

4. Date this description was prepared: 2/20/2024

5 .Available forms of attendance: Mandatory

6. Number of study hours (total)/number of units (total): 60 hours, 2 hours per week  
Number of units (8)

7. Name of the course administrator (if more than one name is mentioned)

Name: Ammar Alaa Majeed

Email: ammar.alaa@mtu.edu.iq

8. course objectives

**Student education:**

**-1 Basic principles and theories of electronics.**

**2-Electronic components, their properties and applications.**

**3- Making, designing and making use of vari  
electronic circuits.**

**Objectives of the study subject**

**Introducing the student to the basics of electronics :  
electronic circuits.**

9. Teaching and learning strategies

The strateg

## 10 .Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1.	4	Introduction to electronics science	Semiconductor theory - addition of negative and positive impurities - currents in	Theoretical lecture  And a practical laboratory	Tests  Written and oral
2.	4	Semiconductor binary	Semiconductors.	Theoretical lecture	Tests
3.	4	Alternating wave unification	Link (PN) – areas	And a practical laboratory	Written and oral
4.	4	Full wave unification	The link - forward bias and reverse bias - is greater	Theoretical lecture	Tests
5.	4	Wave uniformity	Forward current (IF max) –	And a practical laboratory	Written and oral
6.	4	Filters	The greatest reverse effort	Theoretical lecture	Tests
7.	4	Pruning - its types	(PIV max) - the greatest ability	And a practical laboratory	Written and oral
8.	4	Double zener	Dispersive - total resistance	Theoretical lecture	Tests
9.	4	Other types of binaries	-Circle	And a practical laboratory	Written and oral
10.	4	Bipolar transistor	Unified half-wave - calculation of continuous and effective currents and voltages and frequency calculation.	Theoretical lecture	Tests
11.	4	Transistor bias circuits	Using a branch transformer	And a practical laboratory	Written and oral
12.	4	Self-bias	Central - Al-Muwahid Al-Qantari	Theoretical lecture	Tests

13.	4	Equivalent circuit	-Calculating continuous values	And a practical laboratory	Written and oral
14.	4	DC transistor	And effective efforts and currents	Theoretical lecture	Tests
15.	4	Use of transistor	-Output frequency.	And a practical laboratory	Written and oral
16.	4	Response	Comparison between half monotheism	Theoretical lecture	Tests
17.	4	Frequency of the transistor	The complete guide and mentor	And a practical laboratory	Written and oral
18.	4	Transistor as a switch	- Examples of sports.	Theoretical lecture	Tests
19.					
20.	4	Use (FET) in	Other types of FET	Theoretical lecture	Tests
21.	4	Signal amplification	- Properties compared between them.	And a practical laboratory	Written and oral
22.	4	The little one	Composition and types - properties - comparison between them - sparking and extinguishing.	Theoretical lecture	Tests
23.	4	Silicon monoliths	Use of thyristor	And a practical laboratory	Written and oral
24.	4	Current controlled (thyristor)	In dim lighting.	Theoretical lecture	Tests
25.	4	Applied control circuits	Working principle - types -	And a practical laboratory	Written and oral
26.	4	Phase angle	Compare them	Theoretical lecture	Tests
27.	4	With thyristor	Oscillators: Colpitts-Hartley	And a practical laboratory	Written and oral
28.	4	Oscillators	-Dogs...etc.- Examples	Theoretical lecture	Tests

29.	4	Phase shift oscillator	Mathematical.	And a practical laboratory	Written and oral
30.	4	Shakers	Working principle - types - comparison	Theoretical lecture	Tests

## 11 .Course evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

## 12. Learning and teaching resources

	Required textbooks (methodology, if any)
<b>1- -1Electronic and audio circuits (written by: Dhia Mahdi Fares</b> <b>2- - Yasser Khalil-Musab Mahmoud). Publication / Dar Al-Techni:</b> <b>3- Authority of Technical Institutes, Dar Al-Hekma, 1990</b> <b>4- -2Electronic circuits (Dia Mahdi Fares - Sabah Daniel-</b> <b>5- Youssef Ibrahim, Technical House: Authority of Technical Institutes, 1990</b> <b>6- -3Power Electronics (Written by: Dhia Mahdi Fares)</b> <b>7- Youssef Ibrahim Taha (Dar Al-Hekma 1990).</b>	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites

## Course description form

5. Course name: Digital computer circuits

6. Course code

7. Semester/Year: The first and second semester of the academic year 2023-2024

8. Date this description was prepared: 2/20/2024

6 .Available forms of attendance: Mandatory

10. Number of study hours (total)/number of units (total): 60 hours, 2 hours per week  
Number of units (8)

11. Name of the course administrator (if more than one name is mentioned)

Name: Hussein Hashem Zidane

Email:

12. course objectives

**Student education:**

-1 Basic principles and theories of electronics.

2-Electronic components, their properties and applications.

3- Making, designing and making use of various electronic circuits.

**Objectives of the study subject**

**Introducing the student to the basics of electronics and electronic circuits.**

13. Teaching and learning strategies

The strategies

11 .Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1.	4	Numerical systems - binary system, decimal system, octal system, hexadecimal system, conversion from binary to decimal and vice versa. Conversion from decimal to octal, conversion from decimal to hexadecimal and vice versa. Converting from binary to octal and vice versa. Converting from hexadecimal to binary and vice versa. Addition - subtraction in the binary system. Using the complement of the first 2 in binary subtraction.		Theoretical lecture And a practical laboratory	Tests Written and oral
2.					
3.					
4.					
5.	4	Logic gates, foundations of logic gates - AND gate, OR gate, NOT gate, representation of logic gates using switches, AND gate using a diode and a resistor, NOT gate using a transistor, NAND gate, NOR gate, the exclusive XOR gate, The exclusive (Lao) gate, representing different gates using the (Lao) gate once and the (Lao) gate again.		Theoretical lecture And a practical laboratory	Tests Written and oral
6.					
7.					
8.	4	Boolean algebra - De Morgan's theorems - Relationships, Pauline algebraic - De Morgan's theorems, circuits that use different gates and finding a truth table for them, simplifying logical circuits using Boolean algebra, writing the logical equation from the reality table, either using the product of the sum (Sum of product) or the sum of the product (Sum of product).	Dispersive - total resistance	Theoretical lecture And a practical laboratory	Tests Written and oral
9.					
10.	4	Karnaugh map - Karnaugh map for two variables, Karnaugh map for three variables, Karnaugh map for four variables, how to transfer the reality table to the Karnaugh map, various examples of digital circuits and their representation		Theoretical lecture And a practical laboratory	Tests Written and oral
11.					
12.					



		using the map, simplifying logic circuits using the Karnaugh map, the convolution property and the entanglement property.			
13.	4	Digital comparator - single-rank, dual-rank digital comparator.		And a practical laboratory	Written and oral
14.	4	Decoder - binary to octal decoder, binary to decimal decoder and vice versa.4		Theoretical lecture	Tests
15.	4	Encoding, octal to binary encoding, decimal to binary encoding.		And a practical laboratory	Written and oral
16.	4	Semi-add circuit, semi-subtractor circuit, complete add circle, complete subtract circuit, parallel addition circuit, parallel subtraction circuit, using the addition circle to subtract two binary numbers using the 1's complement method.		Theoretical lecture And a practical laboratory	Tests Written and oral
17.					
18.					
19.	4	<b>Swings - Swing (RS) - Swing (JK) - Swing (D) Swing (T) Adding impulse control to the aforementioned swings.</b>		Theoretical lecture And a practical laboratory	Tests Written and oral
20.	4	Swing JK, draft - comparison between different swings, examples of connecting different swings, waveforms, dependence of incoming pulses and outgoing pulses, integrated circuit for different swings 7474. 7476. 7478. 7472. 7473 for (1).		Theoretical lecture And a practical laboratory	Tests Written and oral
21.	4	Counters (general idea), ascending wave counter, descending wave counter, decimal wave counter.		Theoretical lecture And a practical laboratory	Tests Written and oral
22.	4	Increasing-descending ripple counter, series synchronous counter.		Theoretical lecture	Tests
23.	4	Parallel synchronous counter, binary divider (6), binary divider		And a practical laboratory	Written and oral

		(5), common integrated circuits for counters.			
24.	4	Displacement records.		Theoretical lecture	Tests
25.	4	Memory circuits type (RAM: ROM), description of the memory, memory capacity, block diagram of the main types of memories, electronic and logical circuits for memories  DRAM, ARAM, EPROM, PROM, ROM.		And a practical laboratory	Written and oral
26.	4	Introduction / Converting digital values to theory (DAC), type of resistor network, accuracy and precision.		Theoretical lecture	Tests
27.	4	Conversion from theoretical to digital (ADC) using the imidiante method and the comparative method.  ADC in ascending counter method.  ADC uses an ascending descending counter.  Voltage to frequency converter.		Theoretical lecture  And a practical laboratory	Tests  Written and oral
28.					
30.					

## 11 .Course evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

## 13. Learning and teaching resources

	Required textbooks (Methodology, if any)
<b>8- -1Electronic and audio circuits (written by: Dhia Mahdi Fares</b> <b>9- - Yasser Khalil-Musab Mahmoud). Publication / Dar Al-Techni:</b> <b>10- Authority of Technical Institutes, Dar Al-Hekma, 1990</b> <b>11- -2Electronic circuits (Dia Mahdi Fares - Sabah Daniel-</b> <b>12- Youssef Ibrahim, Technical House: Authority of Technical Institutes, 1990</b> <b>13- -3Power Electronics (Written by: Dhia Mahdi Fares)</b> <b>14- Youssef Ibrahim Taha (Dar Al-Hekma 1990).</b>	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites

1. Course name: Electrical Circuits

2. Course code

3. Semester/Year: The first and second semester of the academic year 2023-2024

4. Date this description was prepared: 2/20/2024

5. Available forms of attendance: Mandatory

6. Number of study hours (total)/number of units (total): 60 hours, 2 hours per week  
Number of units (8)

7. Name of the course administrator (if more than one name is mentioned)

Name: Raad Farhoud Jasb

Email:

8. course objectives

**Student education:**

**-1 Basic principles and theories of electronics.**

**2-Electronic components, their properties and applications.**

**3- Making, designing and making use of various electronic circuits.**

**Objectives of the study subject**

**Introducing the student to the basics of electronics and electronic circuits.**

9. Teaching and learning strategies

The strateg

## 12 .Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1.	4	The system of units used in electricity and the units of measurement for each substance (its parts and multiples) - Mathematical applications for converting values using units. Definition of the basic units of voltage, current, and resistance - Components of the electrical circuit - Ohm's law - Factors affecting the value of resistance - Specific resistance of conductive and insulating materials - Effect of temperature On the value of resistance - the thermal coefficient of resistance with solving applied examples.		Theoretical lecture And a practical laboratory	Tests Written and oral
2.	4	DC circuits include:- 1- Connecting resistors in series with examples 2- Connecting resistors in parallel with examples 3- Mixed connection of resistors with examples Star and triangle connection of resistors and conversion from each to the other with examples		Theoretical lecture And a practical laboratory	Tests Written and oral
3.	4	Applications to series, parallel, mixed, star, and triangle circuits.		Theoretical lecture And a practical laboratory	Tests Written and oral
4.	4	Kirchhoff's Laws - Definition of Kirchhoff's law for current and voltage with applied examples.		Theoretical lecture And a practical laboratory	Tests Written and oral

5.	4	Maxwell's law with solutions and applied examples.		And a practical laboratory	Written and oral
6.		Thevenin's Theorem - Definition of View - How to Apply it in DC.			
7.		Norton's theory - definition of the theory - how to apply it in direct current.			
8.	4	Practical examples of Thevenin and Norton theorems.		Theoretical lecture	Tests
9.		Matching theory - definition of the view - steps to apply it in solving direct current circuits that contain more than one source - solving definitional examples of current and voltage source (continuous power distributor) and how to convert from one to the other - theory of transferring the greatest possible power - definition of the theory and derivation of their relationships - applied examples		Theoretical lecture And a practical laboratory	Tests Written and oral
10.	4	Alternating quantities, their definition includes the properties of alternating current - how to generate alternating current and draw its vector and its relationships - defining the effective value (RMS) and the average value and their relationships to find the formation factor and value factor for irregular waveforms with applied examples.		Theoretical lecture And a practical laboratory	Tests Written and oral
11.	4	Alternating vector quantities - their definition - their phase and graphical representation - the phase angle and how to find it - finding the resultant of vector quantities. It includes multiplication, division, addition and subtraction with applied examples.		Theoretical lecture And a practical laboratory	Tests Written and oral
12.	4	The effect of alternating current on a circuit containing only resistance - a circuit containing only pure inductance - a circuit		Theoretical lecture	Tests Written and oral

		containing only pure capacitance - finding the phase angle between voltage and current for each circuit with examples.		And a practical laboratory	
<b>13.</b>	<b>4</b>	The effect of alternating current in a circuit containing resistance and inductance in series - A circuit containing resistance and capacitance in series - A circuit containing resistance, inductance and capacitance in series - Finding the relationship between current and voltage in the three cases - Phase angle - Total impedance of the circuit with applied examples.		And a practical laboratory	Written and oral
<b>14.</b>	<b>4</b>	The effect of alternating current on a circuit containing resistance and inductance in parallel - A circuit containing resistance and capacitance in parallel - A circuit containing resistance, inductance and capacitance in parallel - Finding the relationship between voltage and current in the three cases - Conductive phase angle, its definition and how to find it - Finding permissive impedance with applied examples .		Theoretical lecture	Tests
<b>15.</b>	<b>4</b>	Use the description (J- OPERATOR) or the complex factor to find the total impedance, total permittivity, current, voltage, and phase angle for circuits connecting impedances in series and parallel, with solving examples.		And a practical laboratory	Written and oral
<b>16.</b>	<b>4</b>	Resonant circuits include - the series resonance circuit - defining the state of resonance and how to reach it - calculating the current, voltage, impedance, phase angle and frequency at resonance - finding the beam width - finding the quality factor - drawing the relationship between inductive reactance and capacitive		Theoretical lecture	Tests

		reactance with frequency - solving examples - series resonance circuit - Its definition - calculating current, voltage, impedance, phase angle, and resonant frequency - finding the beam width - drawing graphical relationships with frequency - finding the quality factor - solving examples.			
17.	4	Applying theories such as Norton's theorem, Thevenin's theorem, and congruence to alternating current circuits and solving examples		Theoretical lecture And a practical laboratory	Tests Written and oral
18.	4	Power in alternating current circuits includes calculating power in circuits containing only resistance - circuits containing only inductance - containing only capacitance - a circuit containing resistance, inductance, and capacitance in series and parallel - defining effective power and how to calculate it - ineffective power and how to calculate it.		Theoretical lecture and a practical laboratory	Tests Written and oral
19.	4	Total apparent power (its definition) - How to draw a power triangle - Power factor - Its definition and its effect on alternating current circuits - How to improve the power factor with applied examples.		Theoretical lecture and a practical laboratory	Tests Written and oral
20.	4	The theory of transferring the greatest possible power in alternating current circuits - derivation of its relationships with applied examples.		Theoretical lecture and a practical laboratory	Tests Written and oral
21.	4	Analysis of electrical networks using the node voltage method - introduction - node voltages - number of node voltage equations - node voltage		And a practical laboratory	Written and oral



		equations by examination - joint tolerance - transition space.			
22.	4	Practical examples of analyzing electrical networks using the node method.		Theoretical lecture and a practical laboratory	Tests Written and oral
23.	4	Three-phase alternating current circuits - its definition and how to generate alternating current - one phase - two phases - three phases - with a drawing of each circuit with star and triangular connections.		And a practical laboratory	Written and oral
24.	4	Solving applied examples of three-phase alternating current and triangular and star connections for balanced and unbalanced loads.		Theoretical lecture	Tests
25.	4	Methods for measuring power for three-phase loads - a wattmeter - how to connect it to a circuit to measure active power and calculate inactive power and apparent power with an example solution - measuring power using a wattmeter and a voltage - how to find the total power in this way and in the case of star and triangle connections - using two wattmeters - using three Wattmeters.		And a practical laboratory	Written and oral
26.	4	Transient states of circuits - transient states of direct current - circuits in the transient state: RL circuit, RC circuit, RLC circuit.		Theoretical lecture	Tests
27.	4	Transient alternating currents - transient sinusoidal currents in RC, RL, RLC circuits - transition currents.		And a practical laboratory	Written and oral
28.	4	Self-inductance of the coil (electromagnetic induction) - its definition - special relationships to find the self-inductance of the coil - mutual		Theoretical lecture and a practical laboratory	Tests Written and oral

		<p>inductance between two coils - and relationships to find mutual inductance, depending on the type of connection of the two coils, which includes:</p> <p>A- Linking a mutually reinforcing sequence</p> <p>B- Connecting an opposite sequence</p>			
<b>29.</b>	<b>4</b>	<p>Transformers - installation of the transformer - drawing of the transformer - its features - its working principle and special relationships - types of transformers and solving examples.</p>		<p>Theoretical lecture and a practical laboratory</p>	<p>Tests Written and oral</p>
<b>30.</b>	<b>4</b>	<p>Curves of growth and decay of current from an inductive circuit - explanation of this circuit and its effect on direct current - the general relationship of growth and decay of current in a coil - drawing the current and calculating the time constant - solving examples. Charging and discharging capacitors, including the use of capacitors in direct current circuits. The general relationship for charging and discharging a capacitor and drawing the current - the effect of time constant with its calculation - solving examples.</p>		<p>Theoretical lecture and a practical laboratory</p>	<p>Tests Written and oral</p>

## 11 .Course evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

## 14. Learning and teaching resources

	Required textbooks (Methodology, if any)
<b>1- 1- Principles of electrical engineering - written by Dr. Mohammed Zaki</b> <b>2- - Dr. Muzaffar Anwar.</b>	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites

1. Course name: Mathematic

2. Course code

3. Semester/Year: The first and second semester of the academic year 2023-2024

4. Date this description was prepared: 2/20/2024

5. Available forms of attendance: Mandatory

6. Number of study hours (total)/number of units (total): 60 hours, 2 hours per week  
Number of units (8)

7. Name of the course administrator (if more than one name is mentioned)

Name: Qais Hussein

Email:

8. course objectives

**Helping the student understand the necessary mathematical laws and problems**

**For the purpose of solving simple and complex electrical circuits.**

9. Teaching and learning strategies

The strateg

### 13 .Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1.	2	Matrices - determinants - various applications.		Theoretical lecture	Tests Written and oral
2.	2	Solving linear equations - Tramer's method - applications to determinants - finding the value of currents in multiple electrical circuits.		Theoretical lecture	Tests Written and oral
3.	2	Vectors - vector analysis - vector and scalar quantities - vector algebra - arithmetic operations for vectors in space - phase and directional representation of alternating quantities - phase angle finding the resultant of vector quantities.		Theoretical lecture	Tests Written and oral
4.	2	Orthogonal vectors - scaling vectors - scalar and vector multiplication - applications to magnetic flux vectors - Maxwell - numerical analysis of vectors using coordinates.		Theoretical lecture	Tests Written and oral
5.	2	The function - trigonometric functions and trigonometric relationships - the logarithmic function - calculating the value of the direct current for a semi-bridge circuit - calculating the effective value of the voltage - the load line of the transistor.		Theoretical lecture	Written and oral
6.	2	The exponential function - hyperbolic functions - applications for drawing instantaneous functions for a first-order electrical circuit - representation of a filter circuit (coil and expansion) for an		Theoretical lecture	

		exponential function - current rate.			
7.	2	Objectives - The purpose of algebraic and trigonometric functions - Applications to objectives.		Theoretical lecture	
8.	2	Differentiation - derivative - derivative of algebraic functions - chain rule - building a differential circuit - calculating speed and acceleration - speed of light.		Theoretical lecture	Tests
9.	2	The implicit function - the standard function - the derivative of higher orders - represents a physical system of the implicit function.		Theoretical lecture	Tests Written and oral
10.	2	The derivative of trigonometric functions - the derivative of logarithmic functions - calculating the effective value of the current in a circuit (coil, capacitor, and resistance) and the voltage gain in the bill.		Theoretical lecture	Tests Written and oral
11.	2	Derivative of exponential functions - derivative of hyperbolic functions - calculation of the time constant.		Theoretical lecture	Tests Written and oral
12.	2	Applications of the derivative - the tangent and perpendicular equation - speed and acceleration - calculating the rate of change of voltage and current as a function of time.		Theoretical lecture	Tests Written and oral
13.	2	Increasing and decreasing - maximum and minimum limits - points of inflection - drawing functions - drawing the response of an expanding second-order circle, a coil, and a resistance.		Theoretical lecture	Written and oral
14.	2	General physics and engineering applications.		Theoretical lecture	Tests
15.	2	Integration - indefinite integration - integration of algebraic and algebraic functions - calculating the value of the expansion charge.		Theoretical lecture	Written and oral

16.	2	Integration of exponential and trigonometric functions		Theoretical lecture	Tests
17.	2	Definite integration - applications of definite integration - area under the curve - area between two curves - calculation of electrical power.		Theoretical lecture	Tests Written and oral
18.	2	Rotational volumes - arc length of the curve.		Theoretical lecture	Tests Written and oral
19.	2	Physical and engineering applications (work - torque - momentum - moment of inertia).		Theoretical lecture	Tests Written and oral
20.	2	General methods of integration, including compensation, division, and the use of partial, exponential, and logarithmic fractions - building an integrator circuit using resistance and inductance - representing an electrical circuit with integral equations - an amplifier circuit using an integrated circuit.		Theoretical lecture And a practical laboratory	Tests Written and oral
21.					
22.					
23.	2	Numerical methods of integration - trapezoid rule - Simpson's rule - finding distance from acceleration and speed - finding the effective current value of a bridge rectifier.		Theoretical lecture	Written and oral
24.	2	Solving discrete, homogeneous, and linear differential equations with their various applications within the field of specialization - positive, negative, and complex series circuits.		Theoretical lecture And a practical laboratory	Tests Written and oral
25.					
26.	2	Complex numbers - addition, subtraction, multiplication and division - geometric representation of complex numbers - the relationship of electrical units to complex numbers.		Theoretical lecture	Tests
27.	2	Polar formula: Converting the algebraic formula to polarity and vice versa - The relationship of		Theoretical lecture	Written and oral

		the coefficient (n) to electronic circuits - The exponential formula in converting de Doumez's theory and its use in solving complex electrical circuits. Calculations of power transmission lines using line constants.			
<b>28.</b>	<b>2</b>	Forces and roots - representing roots - finding roots for electrical circuits to determine stability - star and triangle representation.		Theoretical lecture	Tests Written and oral
<b>29.</b>	<b>2</b>	Statistical operations - frequency distributions - frequency histogram - frequency curve - probability and range - arithmetic and geometric mean - sample.		Theoretical lecture	Tests Written and oral
<b>30.</b>	<b>2</b>	Arithmetic mean - average - standard deviation - variance - relative dispersion - relationship between the mean, median and mode - coefficient of variation - standard variable.		Theoretical lecture	Tests Written and oral



## 11 .Course evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

## 10.Learning and teaching resources

	Required textbooks (Methodology, if any)
<b>1- 1-From Schaum's series (Solving Electrical Circuits). Written by Joseph A. 2- 2-Methods for solving differential equations, written by: Khaled Ahmed Al-Samarrai - Yahya Abdel Saeed 3- Calculus ((Thomas)) 4- Laplace Transformation</b>	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites

1. Course name: Computer Application

2. Course code

3. Semester/Year: The first and second semester of the academic year 2023-2024

4. Date this description was prepared: 2/20/2024

5. Available forms of attendance: Mandatory

6. Number of study hours (total)/number of units (total): 60 hours, 2 hours per week  
Number of units (8)

7. Name of the course administrator (if more than one name is mentioned)

Name: Bahaa Karim Muhammad

Email:

8. course objectives

**-Special:- Providing the student with knowledge and skills in using**

**Calculator and application on Excel to create tables**

**Various arithmetic operations and functions in the fie**

**Its specialty is to provide the student with knowledge and skills in using the Auto CAD system to draw electrical diagrams and use programs**

**Ready for specialization.**

**Teaching students how to use ready-made systems on computers**

**Its applications and applications in its field specialization and benefit from it.**

9. Teaching and learning strategies

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## 14 .Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1.	4	Calculator - its definition - features - generations - languages - hardware components - software - measuring calculator memory - keyboard.		Theoretical lecture And a practical laboratory	Tests Written and oral
2.					
3.	4	Operating systems - their importance - types - introduction to the operating system (MS DOS) - manuals and their levels - internal and external commands.		Theoretical lecture And a practical laboratory	Tests Written and oral
4.	4	Creating directories - deleting directories - reviewing directories and files - naming files - renaming the file VOL - VER.		Theoretical lecture And a practical laboratory	Tests Written and oral
5.	4	Types of disk drives - Types of disks used - Formatting disks (FORMAT) - CLS		And a practical laboratory	Written and oral
6.	4	Instruct copy – xcopy – disk copy – type – backup – chkdsk.		Theoretical lecture And a practical laboratory	Tests Written and oral
7.		An application about directories and files.			
8.	4	Introduction to the Windows system - operating the system - recognizing the contents of the desktop - the taskbar - using the mouse - performing actions with the mouse - opening and closing menus - terminating Windows.		Theoretical lecture	Tests
9.		Steps to run the ready-made program - Open the Excel program - Menu bar - Enter headings, texts and data (by		Theoretical lecture	Tests Written and oral

		example) - Format the table - Exit the program.		And a practical laboratory	
10.	4	Converting data into graphs - performing some calculations - using some functions.		Theoretical lecture And a practical laboratory	Tests Written and oral
11.	4	Application on the Excel program in the field of specialization.		Theoretical lecture And a practical laboratory	Tests Written and oral
12.	4	Introduction to the AUTO CAD system - components - operating the system - main menu - drawing screen components.		Theoretical lecture And a practical laboratory	Tests Written and oral
13.	4	GRID screen dimensions - SNAP cursor movement - LIMITS screen - function keys.		And a practical laboratory	Written and oral
14.	4	Methods of entering information (POLAR, ABSOLUTE, RELATIVE).		Theoretical lecture	Tests
15.	4	How to work with toolbars.		And a practical laboratory	Written and oral
16.	4	Draw a straight, square (LINE) – zoom in.		Theoretical lecture	Tests
17.	4	Capture shapes CLOSE- VIEW – MORE – REGAN – REDRAW – ORTHO – LAST, CROSSING, WINDOW, REMOVE, PREVIOUS.		Theoretical lecture And a practical laboratory	Tests Written and oral
18.	4	Store the design and finish the work, SAVE, END, QUIT		Theoretical lecture and a practical laboratory	Tests Written and oral
19.	4	Instruction - FILL - HATCH - SOLID - SCALE.		Theoretical lecture	Tests Written and oral

				and a practical laboratory	
20.	4	Create a drawing layer with new specifications: LAYAR – LINETYPE – CHANGE.		Theoretical lecture and a practical laboratory	Tests Written and oral
21.	4	Drawing arcs - ARC - and circles - CIRCILE - HATCH - OFFSET.		And a practical laboratory	Written and oral
22.	4	Instructions: MIRROR - TRIM - ADD		Theoretical lecture and a practical laboratory	Tests Written and oral
23.	4	- FILLT - EXTEND - BREAK.		And a practical laboratory	Written and oral
24.	4	Draw an electrical circuit in application of the previous instructions.		Theoretical lecture	Tests
25.	4	Completing the previous diagram with the addition of TEXT.		And a practical laboratory	Written and oral
26.	4	Drawing the curve of the relationship between power, voltage, and efficiency with a line of medium length (study of the phenomenon of voltage drop) - Drawing the thyristor properties curve.		Theoretical lecture	Tests
27.	4	Projecting electrical installation work on a house plan - drawing an electronic circuit.		And a practical laboratory	Written and oral
28.	4	Introduction to the Internet - Internet addresses - Types of files on the Internet.		Theoretical lecture and a practical laboratory	Tests Written and oral
29.	4	Running browser programs - advantages of the browser program - inspection - search		Theoretical lecture	Tests Written and oral

		engines - inspection of university libraries.		and a practical laboratory	
30.	4	E-mail and dealing with it - call programs and dealing with them.		Theoretical lecture and a practical laboratory	Tests Written and oral

### 11 .Course evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

### 10.Learning and teaching resources

	Required textbooks (Methodology, if any)
<b>1- Managing the DOS operating system (MSDOS 6) - Dr. Far Fahmy Ziadeh, How to use the computer and the Internet Hussam Al-Mustarihi, Windows 89 - Muhammad Jamal Muhammad, Principles of AutoCAD 13</b> <b>2- AUTO CAD translated by Omar Al-Aboudi.</b>	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites

1. Course name: Physiology

2. Course code

3. Semester/Year: The first and second semester of the academic year 2023-2024

4. Date this description was prepared: 2/20/2024

5. Available forms of attendance: Mandatory

6. Number of study hours (total)/number of units (total): 60 hours, 2 hours per week  
Number of units (8)

7. Name of the course administrator (if more than one name is mentioned)

Name: Dr Israa Jabbar Shamkhi

Email:

8. course objectives

**Preparing the student to study and understand medical devices by explaining the changes**

**Physiological, especially electrical, which is done when measuring organs**

**Different functions of the body and its relationship to the devices used to measure**

**And diagnose various phenomena and diseases.**

9. Teaching and learning strategies

The strateg

## 15 .Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1.	2	Muscle tissue - types of muscles (skeletal - bronchial - visceral), changes that occur in the muscle during and after contraction, especially electrical changes - simple muscle contraction..		Theoretical lecture	Tests
2.					Written and oral
3.	2	Muscle pain - muscle stress - the effect of successive stimuli on the muscle and its contraction.		Theoretical lecture	Tests
4.					Written and oral
5.	2	The sensory nervous system (its parts - functions - functional areas in the brain - transmission of stimuli - the role of nerves in transmitting stimuli - reflexes.		Theoretical lecture And a practical laboratory	Tests
6.					Written and oral
7.	2	The autonomic nervous system (sympathetic nervous system and parasympathetic nervous system).		Theoretical lecture And a practical laboratory	Tests
8.					Written and oral
9.	2	The circulatory system (the heart - its structure - its work - the importance of the heartbeat, the blood vessels - its components - its types - its work and its importance).		Theoretical lecture	Tests
10.					Written and oral
11.	2	Blood pressure - measuring it - its importance - the role of blood in the body.		Theoretical lecture	Tests
12.					Written and oral
13.	2	Respiratory system (breathing - types of breathing - blood work in the respiratory system - respiratory movements - cavity pressure).		Theoretical lecture And a practical laboratory	Tests
14.					Written and oral
15.	2	Lung expansion - respiratory capacity - vital capacity - components of inhaled air.		Theoretical lecture	Tests
16.					Written and oral



				And a practical laboratory	
17.	2	The digestive system (its structure, parts, importance, digestive glands, liver, digestive secretions, stages of digestion).		Theoretical lecture	Tests
18.					Written and oral
19.	2	Digestion of carbohydrates, digestion of proteins, digestion of fats, absorption, assimilation, and excretion.		Theoretical lecture	Tests
20.					Written and oral
21.	2	The urinary system (kidney - ureter - bladder - external opening) composition of the system parts - the importance of the urinary system.		Theoretical lecture	Tests
22.					Written and oral
23.	2	Diuretic formation - urinary urea and urinary stones - the effect of the kidneys on blood pressure - components of diuresis and their properties		Theoretical lecture	Tests
24.					Written and oral
25.	2	Endocrine glands - their types and importance.		Theoretical lecture	Tests
26.					Written and oral
27.	2	Secretions - endocrine glands - work of the endocrine glands.		Theoretical lecture	Tests
28.					Written and oral
29.	2	The reproductive system - its components and functions.		Theoretical lecture	Tests
					Written and ora

### 11 .Course evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

### 10.Learning and teaching resources

	Required textbooks (Methodology, if any)
<b>1- Bioelectricity By : Mary A. Brazier .</b> <b>2- Text Book Of Physiology By : Best and Taylor.</b> <b>3- Phyaiological Basis of Medical Practice Ninth Edition</b> <b>By : Jhon R . BG back-S &amp;C . CO . New Delhi .</b>	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites

1. Course name: Human rights and democracy

2. Course code

3. Semester/Year: The first and second semester of the academic year 2023-2024

4. Date this description was prepared: 2/20/2024

5. Available forms of attendance: Mandatory

6. Number of study hours (total)/number of units (total): 60 hours, 2 hours per week  
Number of units (8)

7. Name of the course administrator (if more than one name is mentioned)

Name: Abdullah Salman

Email:

8. course objectives

**Preparing the student to study and understand medical devices by explaining the changes**

**Physiological, especially electrical, which is done when measuring organs**

**Different functions of the body and its relationship to the devices used to measure**

**And diagnose various phenomena and diseases.**

9. Teaching and learning strategies

The  
Strategy

## 16 .Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1.	2	Human rights expose their goals		Theoretical lecture	Tests Written and oral
2.	2	Human rights in ancient civilizations, especially the Mesopotamian civilization		Theoretical lecture	Tests Written and oral
3.	2	Human rights in divine laws, with a focus on human rights in Islam		Theoretical lecture	Tests Written and oral
4.	2	Human rights in contemporary and modern history and international recognition of human rights since World War I and the League of Nations		Theoretical lecture	Tests Written and oral
5.	2	Regional recognition of human rights European Convention on Human Rights 1950 American Convention on Human Rights 1969 African Charter on Human Rights 1981 Arab Charter on Human Rights 1994		Theoretical lecture	Tests Written and oral
6.	2	Human rights in Iraqi constitutions between theory and reality		Theoretical lecture	Tests Written and oral
7.	2	The relationship between human rights and public freedoms:		Theoretical lecture	Tests

					Written and oral
<b>8.</b>	<b>2</b>	1- In the Universal Declaration of Human Rights		Theoretical lecture	Tests Written and oral
<b>9.</b>	<b>2</b>	2- In regional charters and national constitutions		Theoretical lecture	Tests Written and oral
<b>10.</b>	<b>2</b>	Economic, social and cultural human rights and civil and political human rights		Theoretical lecture	Tests Written and oral
<b>11.</b>	<b>2</b>	Modern human rights, facts in development, the right to a clean environment, the right to solidarity, the right to religion		Theoretical lecture	Tests Written and oral
<b>12.</b>	<b>2</b>	The general theory of freedoms: the origin of rights and freedoms. The project's position on declared rights and freedoms. Using the term general freedoms		Theoretical lecture	Tests Written and oral
<b>13.</b>	<b>2</b>	The legal rule of the state of law		Theoretical lecture	Tests Written and oral
<b>14.</b>	<b>2</b>	Regulation of public freedoms by public authorities		Theoretical lecture	Tests Written and oral
<b>15.</b>	<b>2</b>	Equality: The historical development of the concept of equality		Theoretical lecture	Tests Written and oral
<b>16.</b>	<b>2</b>	Democracy definition and types		Theoretical lecture	Tests Written and oral
<b>17.</b>	<b>2</b>	Concepts of democracy		Theoretical lecture	Tests Written and oral
<b>18.</b>	<b>2</b>	Democracy in the Third World		Theoretical lecture	Tests Written and oral

19.	2	Democratic systems in the world		Theoretical lecture	Tests Written and oral
20.	2	The concept of freedoms and classification of public freedoms		Theoretical lecture	Tests Written and oral
21.	2	Basic freedoms, intellectual freedoms, economic and social freedoms		Theoretical lecture	Tests Written and oral
22.	2	Freedom, security and feeling of reassurance		Theoretical lecture	Tests Written and oral
23.	2	Freedom of education		Theoretical lecture	Tests Written and oral
24.	2	Freedom of the press		Theoretical lecture	Tests Written and oral
25.	2	Freedom of assembly		Theoretical lecture	Tests Written and oral
26.	2	Freedom of association		Theoretical lecture	Tests Written and oral
27.	2	Freedom of action		Theoretical lecture	Tests Written and oral
28.	2	The right to own property		Theoretical lecture	Tests Written and oral
29.	2	Freedom of trade and industry		Theoretical lecture	Tests Written and oral
30.	2	women freedom		Theoretical lecture	Tests Written and oral

## 11 .Course evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

## 10.Learning and teaching resources

	Required textbooks (Methodology, if any)
	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites

1. Course name: Electronic workshops

2. Course code

3. Semester/Year: The first and second semester of the academic year 2023-2024

4. Date this description was prepared: 2/20/2024

5. Available forms of attendance: Mandatory

6. Number of study hours (total)/number of units (total): 60 hours, 2 hours per week  
Number of units (8)

7. Name of the course administrator (if more than one name is mentioned)

Name: Nubras Shamakhi

Email:

8. course objectives

**Preparing the student to study and understand medical devices by explaining the changes**

**Physiological, especially electrical, which is done when measuring organs**

**Different functions of the body and its relationship to the devices used to measure**

**And diagnose various phenomena and diseases.**

9. Teaching and learning strategies

The  
Strategy



## 17 .Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1-	2	Measuring devices and how to use them.		Practical lecture	Tests Written and oral
2-	2	How to read the resistance value with an ohmmeter, colors, and connect resistors		Practical lecture	Tests Written and oral
3-					
4-	2	How to read expansions and their types and connect the expansions in series and parallel		Practical lecture	Tests Written and oral
5-					
6-	2	Coil types and linking files in series and parallel practical exercise with examination		Practical lecture	Tests Written and oral
7-	2	Checking the diode for faults and connecting an electronic circuit Simple		Practical lecture	Tests Written and oral
8-					
9-	2	Checking the transistor and detecting faults connecting a circuit Simple		Practical lecture	Tests Written and oral
10-					
11-	2	Bridges, how to connect them and inspect them		Practical lecture	Tests Written and oral
12-					
13-	2	Preparing small electronic projects by students		Practical lecture	Tests Written and oral
14-	2	Training students to read electronic maps		Practical lecture	Tests Written and oral
15-					