Ministry of Higher Education and Scientific Research

Scientific Supervision and Scientific Evaluation Apparatus

Directorate of Quality Assurance and Academic Accreditation

Accreditation Department

Academic Program and Course Description Guide

2024-2025

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its third version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly).

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description 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 brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have 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 sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They 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 / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Ministry of Higher Education & Scientific Research

Supervision and Scientific Evaluation Apparatus

Department of Quality Assurance and Academic Accreditation

Academic Program Description Form for Colleges and Institutes for the Year 2024-2025

University: Al-Furat Al-Awsat Technical University

College / Institute: Al-Mussaib Technical Institute

Scientific Department: Department of Medical Instruments Techniques

Date of filling the file: 27-2-2025

Signature:

Head of Department: Haider J. Kareem

Date: 27-2-2025

Signature:

Scientific Assistant: Dr. Muhammad H. Sabri

Date: 27-2-2025

The file was verified by: The quality assurance and university performance division

Name of the Director of the Quality Assurance & University Performance Division:

Walaa Hussein Allawi

Date: 27-2-2025

Signature:

جامعة الفرات الأوسط التقنية
المعهد التقني المسيب
شعبة ضمان الجودة والأداء الجامعي

Approval of the Dean

3-3-2025

Academic Program Description

This academic program description provides a summary of the most important characteristics of the program and the learning outcomes expected from the student to achieve, showing whether he has made the most of the available opportunities and accompanied by a description of each course within the program.

1. Educational institution	Al-Furat Al-Awsat Technical University
2. Scientific department /Center	Al-Mussaib Technical Institute
3. Name of the academic or professional program	Department of Medical Instruments Techniques
4. Name of the final certificate	Technical diploma
5. Academic system: Annual /courses/others	Annual system
6. Accredited accreditation program	National Council for improving the quality of Technical Engineering Education.
7. Other external influences	There is a close relationship with the labor market that receives our graduates.
8. Date of preparation of the description	27-2-2025

9. The message of the academic program

The mission of the Department of Medical Instruments Techniques is to provide an educational and technical environment through modern educational programs and curricula that show the importance of this specialty.

10. Objectives of the academic program

1. Preparing a generation of technical graduates who are scientifically and practically capable of maintaining medical devices in hospitals and outpatient clinics.
2. The ability to meet the requirements of the labor market and the needs of society.
3. Preparing and creating qualified graduates to continue their initial and higher university studies.
4. The ability to adapt and communicate with scientific and engineering developments.
5. Establishing cooperation links and reaching out to academic and community bodies.
6. Creating and preparing qualified technical staff to work in various sectors of the state and private sectors.

11. Required program outputs and teaching, learning & evaluation methods

1. Providing theoretical and practical information on relevant topics.
2. The ability to examine and develop various medical devices.
3. The ability to deal with modern engineering programs related to hardware maintenance and programming.
4. The ability to prepare studies in health management related to the development of medical devices.
5. Preparing the student to be able to continue his studies to higher levels.

A. The program-specific skill objectives

1. Identify the main parts of medical devices.
2. The ability to operate medical devices and keep up with scientific development.
3. Getting to know the basic principles of medical device maintenance.
4. Calculation of skills related to the subject of medical devices and machines.
5. The ability to rehabilitate medical devices to ensure the development of their performance.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Daily assessment
2. Oral examinations
3. Daily exams with
4. Monthly exams
5. Final exams

B. Emotional and value-based objectives

1. Develop the student's personality.
2. How to deal with and develop the language of public speaking.
3. Provide scientific advice on the maintenance of Medical Devices.
4. Provide practical advice on the maintenance of Medical Devices.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. General & transferable skills (other skills related to employability and personal development)

1. The use of ready-made systems such as AutoCAD. Microsoft Office .....).
2. Improving the maintenance of Medical Devices.
3. Gain skills in the use of Medical Devices.
4. Knowing how Precision Medical Devices and machines work.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

12.Program structure				
Academic stage	**Course code**	**Course name**	**Credit hours**	
			Theoretical	**Practical**
First stage	Electronic	**Elec1**	2	2
	Electrical Circuits	**Elci1**	2	2
	Digital Circuits	**Log1**	2	2
	Mathematics	**Math**	2	---
	Computer Applications (1)	**Cop/1**	1	---
	Engineering & Electrical Drawing	**Drw**	---	3
	Workshop	**Work/1**		4
	Physiology	**Phis**	2	---
	Human Rights & Democracy	**Dec**	1	---
	English Language	**Eng/1**	1	---
	Arabic Language	**Arb/1**	2	---
Second stage	Electronic Circuits	**Elecci**	2	2
	Microprocesses	**Micro**	2	2
	Measuring devices	**Mesu**	2	2
	Electronic Medical Devices	**ElecDev**	2	2
	Electromechanical Medical Devices	**MicElctroDev**	2	2
	Medical Device Maintenance Workshop	**Work/2**	---	4
	Computer Applications (2)	**Cop/2**	1	-
	Control	**Contr**	2	2
	English Language	**Eng/2**	1	---
	Arabic Language	**Arb/2**	2	---
	Baath Party Crimes	**Bath**	1	---
	Programmable Logic Control (PLC) (Semester -2)	**PLC**	1	2
	The project	**Pro**	---	2

13. Planning for personal development

Developing the student's personality and developing the student's interaction with society in general through teamwork and distributing them in the form of groups in laboratories and promoting public speaking and dialogue with others.

14. Admission criteria

(setting regulations related to admission to college or institute) central admission.

Average: 65

Graduated branch: Scientific + Industrial

15. The most important sources of information about the program

1. Free education (scientific curricula) in the department.
2. The amendments proposed by the teachers of the department do not exceed 20% of the planned curriculum.
3. National Council for improving the quality of technical engineering education.

16. Faculty

Faculty members

Scientific Rank	Specialization		Special requirements/ skills (If any)		Number of teaching staff	
	General	Special			Employee	Lecturer
Assistant Professor	Engineering	Electric			1	
Lecturer	Engineering	Electronic			1	
Lecturer	Engineering	Electric			2	
Assistant Professor	Engineering	Applied Mechanics			1	
Lecturer	Science	Artificial intelligence			1	
Assistant lecturer	Engineering	Electronic			1	
Assistant lecturer	Engineering	Electric			2	
Assistant lecturer	Science	Bio Resistance			1	
Assistant lecturer	Science	Computer Science			1	

Professional development
Mentoring new faculty members
1. Teaching and the ability to cover various subjects efficiently. 2. commitment to working hours and office hours. 3. Preparation of teaching materials. 4. Working in a team spirit. 5. Feedback through the peer-to-peer evaluation process.
Professional development of faculty members
1. Research activity. 2. Participation and interaction in the committees and meetings of the department. 3. Participation in scientific activities. 4. Ability to scientific and research development.

Program development plan
1. Holding workshops to train faculty members. 2. Review the description of the curriculum vocabulary according to the learning outcomes. 3. Sending the program and courses for external review. 4. Review the learning policies in light of the results of some exams.

Curriculum skills chart

Please tick the boxes corresponding to the individual learning outcomes of the evaluated program.

				Required learning outcomes of the program																	
Year/Level	Course code	Course name	Basic or Optional	Cognitive objectives					The program-specific skill objectives					Emotional & value-based objectives				General and qualifying skills transferred (other skills related to employability and personal development)			
				A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D1	D2	D3	D4
First stage	Elec1	Electronic	Basic	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
	Elci1	Electrical Circuits	Basic	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	Log1	Digital Circuits	Basic	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	Math	Mathematics	Optional	✓		✓		✓				✓						✓			
	Cop/1	Computer Applications (1)	Optional	✓		✓		✓			✓			✓	✓			✓	✓	✓	✓
	Drw	Engineering & Electrical Drawing	Optional			✓	✓	✓			✓			✓				✓			✓
	Work/1	Workshop	Optional	✓			✓	✓											✓		✓
	Phis	Physiology	Optional	✓			✓							✓							
	Dec	Human Rights & Democracy	General	✓			✓							✓							
	Eng/1	English Language	General	✓			✓							✓							
	Arb/1	Arabic Language	General	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Second stage	Elecci	Electronic Circuits	Basic	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Micro	Microprocesses	Basic	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Mesu	Measuring devices	Basic	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓
	ElecDev	Electronic Medical Devices	Basic	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

	MicElctroDev	Electromechanical Medical Devices	Basic	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Work/2	Medical Device Maintenance Workshop	Basic	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
	Cop/2	Computer Applications (2)	Optional	✓		✓		✓			✓			✓	✓			✓	✓	✓	✓
	Contr	Control	Basic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Eng/2	English Language	General	✓			✓							✓							
	Arb/2	Arabic Language	General	✓			✓							✓							
	Bath	Baath Party Crimes	General	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓
	Plc	Programmable Logic Control (PLC) (Semester -2)	Basic	✓		✓	✓	✓				✓		✓	✓		✓	✓	✓	✓	✓
	pro	The project	Basic	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

1ST STAGE

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Electronic - **Elec1**
4. Available forms of attendance	Class
5. Semester/year	First Year
6. Number of academic hours (total)	30 * 4 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To introduce the student to the basics of electronics and electronic circuits.	
Specific Objective: The student will be able to: **1.** Basic principles and theories of Electronics. **2.** Electronic components, their properties, and applications. **3.** Create, design, and utilize various electronic circuits.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student gets to know the basic concepts.
2. Get to know the types of electronic components.
3. The student learns how to use Kirchhoff's laws and Ohm's laws to analyze Electronic Circuits.
4. Design Electronic Circuits.

B. Course-specific skill objectives

1. Practical application of concepts.
2. Analysis and interpretation.
3. Circuit design.
4. Use of measuring tools.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating students to engage in dialogue and participate in work groups that develop teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and qualifying skills transferred (other skills related to employability and personal development)

1. Use ready-made systems such as (AutoCAD, Multisim, etc.).
2. Gain skills in using different types of electrical circuits and analyzing them mathematically.
3. Know the operation of rectifiers and inverters and how to maintain them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**4**	Introduction to Electronics Semiconductor Theory Addition of Negative and Positive Impurities Currents in Semiconductors.	Learn the basics of electronics.	Lecture + Lab	Oral assessment
2	**4**	Semiconductor Diode _ PN Junction - Junction Regions Forward Bias and Reverse Bias.	Forward and reverse bias of diode.	Lecture + Lab	Oral assessment
3	**4**	AC Rectifier Half Wave Rectifier Calculation of DC and effective currents and voltages and frequency calculation.	Half wave rectifier.	Lecture + Lab	Oral assessment + Short exam
4	**4**	Full wave rectifier using a center-branch transformer Bridge rectifier.	Continuous Value Calculation.	Lecture + Lab	Oral assessment
5	**4**	Comparison between half wave and full wave.	Mathematical examples.	Lecture + Lab	Oral assessment + Short exam
6	**4**	Filters LC and RC filters Output voltages Ripple.	Voltage Multipliers.	Lecture + Lab	Oral assessment
7	**4**	Types of pruning: negative, positive, compound Obligation - its types.	Negative and positive compound.	Lecture + Lab	Oral assessment
8	**4**	Zener Diode: Structure, Symbol, Forward and Reverse Properties.	Breakdown voltage and reflection Zener impedance and its use.	Lecture + Lab	Oral assessment + Short exam
9	**4**	Other types of diodes: Capacitance - Light-emitting diode - Seven-segment diode Seven-segment diode.	Binary Variable.	Lecture + Lab	Oral assessment
10	**4**	Bipolar transistor: structure - symbol - characteristics - area and definition () definition () - relationship between them.	Transistor	Lecture + Lab	Oral assessment
11	**4**	Transistor Bias Circuits - Base	Defining important regions on	Lecture	Oral

		Bias - Emitter Bias - Collector Bias.	property curves.	+ Lab	assessment + Short exam
12	**4**	Self-bias Voltage divider bias Feedback bias.	Mathematical examples.	Lecture + Lab	Oral assessment
13	**4**	- DC equivalent circuit of transistor - DC load line.	Work area points.	Lecture + Lab	Oral assessment
14	**4**	Using Transistor to Amplify Small Signals - AC Equivalent Circuit.	Current Gain Voltage Gain.	Lecture + Lab	Oral assessment
15	**4**	Frequency response of a transistor: Bandwidth Amplifier input and output resistances.	Types of amplifiers Comparative.	Lecture + Lab	Exam
16	**4**	Transistor as a switch Work areas.	Saturation and disconnection Bias.	Lecture + Lab	Oral assessment
17	**4**	Transistor in voltage regulation: series regulator - parallel regulator.	DC power supplies in the form of transistors as a switch.	Lecture + Lab	Oral assessment
18 + 19 18	**4**	Field Effect Transistor: Its Structure The Relationship Curve between (α) and (β) Definition of Narrow Voltage.	Comparison between (JFET) and (BJT).	Lecture + Lab	Oral assessment
20	**4**	Use of FET in Small Signal Amplification - Other Types of FET.	Its properties compared to each other.	Lecture + Lab	Oral assessment + Short exam
21	**4**	Silicon Thyristor	Comparison between them Ignition and extinguishing.	Lecture + Lab	Oral assessment
22	**4**	Application circuits for controlling phase angle with thyristor.	Using thyristor to reduce lighting.	Lecture + Lab	Oral assessment
23	**4**	Oscillators - Working Principle.	Types - Comparison	Lecture + Lab	Oral assessment + Short exam
24	**4**	Phase shift oscillator Oscillators: Colpitts -Hartley	and so, on mathematical examples.	Lecture + Lab	Oral assessment

		Clapps....			
25	**4**	Vibrators: Working Principle.	Types - Comparison between them.	Lecture + Lab	Oral assessment
26	**4**	Monostable Oscillators.	bistable unstable	Lecture + Lab	Oral assessment
27	**4**	Integrated Circuits Advantages and Disadvantages - Comparison with Discrete Components.	Idea about its manufacture.	Lecture + Lab	Oral assessment + Short exam
28	**4**	Operational amplifier (741) - its symbol.	Recommendation Parties - Its Uses.	Lecture + Lab	Oral assessment
29	**4**	Operational Amplifier Applications: Large Signal Small Signal - Signal Summation.	Subtracting signals – examples.	Lecture + Lab	Oral assessment
30	**4**	Operational Amplifier Applications: Joints – Comparative.	Supplement – Template.	Lecture + Lab	Exam

11. Infrastructure	
1. Required textbooks	A textbook on electronic circuits and any new lectures prepared by the instructor + a laboratory experiments booklet.
2. Main References (Sources)	Modern books, courses, software and websites related to electronics.
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet.
B. Electronic references and websites	Resources available on engineering materials properties websites. https://www.abhath.net
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Electrical Circuits and Measurement- **Elci1**
4. Available forms of attendance	Class
5. Semester/year	First Year
6. Number of academic hours (total)	30 * 4 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: The student should be familiar with and able to: Apply general electrical laws and analyze single-phase Electrical Circuits in addition to circuits equipped with three-phase sources.	
Specific objective: The student will be able to: **1.** Apply general electrical laws when analyzing electrical circuits. **2.** Choose the most appropriate application when analyzing DC and AC circuits. **3.** Identify the various basic electrical theories and perform mathematical applications on them.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. Knowledge, understanding and theoretical information on related topics.
2. Ability to analyze Electrical Circuits.
3. Ability to connect Electrical Circuits.
4. Ability to provide theoretical experience.

B. Course-specific skill objectives

1. Identify the different electrical circuits and devices used in measurements.
2. Identify the rectification process and how to convert energy levels using rectifiers.
3. Use filters and coils to improve current and voltage levels.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and qualifying skills transferred (other skills related to employability and personal development)

1. Using ready-made systems such as (AutoCAD. Multisim ....).
2. Acquiring skill in using different types of Electrical Circuits.
3. The student knows the methods of analyzing Electrical Circuits mathematically.
4. Knowing the work of rectifiers and inverters and how to maintain them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**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.	Unit system	Lecture	Oral evaluation
2	**4**	DC circuits including: 1. Connecting resistors in series with examples. 2. Connecting resistors in parallel with examples. 3. Mixed connection of resistors with examples. 4. Star and triangular connection (ΔY) of resistors and conversion from each of them to the other with examples.	Connecting circuits	Lecture + Laboratory	Oral exam + Practical evaluation
3	**4**	Applications on series, parallel, mixed, star and triangular circuits	Circuit applications	Lecture + Laboratory	Short exam + Practical assessment
4	**4**	Kirchhoff's Laws - Definition of Kirchhoff's Law of Current and Voltage with Application Examples	Kirchhoff's laws	Lecture + Laboratory	Oral assessment + Short exam
5	**4**	Maxwell's law with solutions and practical examples	Maxwell's Law	Lecture + Laboratory	Short exam + Practical assessment
6	**4**	Thevenin’s Theorem - Definition of Theorem - How to Apply It in DC	Thevenin's theory	Lecture + Laboratory	Short exam + Practical assessment
7	**4**	Norton's Theorem - Definition of Theorem - How to Apply It in DC	Norton's theory	Lecture + Laboratory	Short exam + Practical assessment
8	**4**	Practical examples of	Niven and Norton	Lecture	Short exam

		Thevenin and Norton theorems	theories	+ Laboratory	+ Practical assessment
9	**4**	Congruence Theorem - Definition of the Theorem - Steps for applying it in solving DC circuits that contain more than one source	Congruence theory	Lecture + Laboratory	Short exam + Practical assessment
10	**4**	Alternating quantities and their definition include the properties of alternating current - how to generate alternating current, draw its waveform and its relationships	alternating quantities	Lecture + Laboratory	Short exam + Practical assessment
11	**4**	Alternating vector quantities - definition - phase and graphical representation	Alternating quantities and their definition	Lecture + Laboratory	Short exam + Practical assessment
12	**4**	Effect of alternating current on a circuit containing only resistance - a circuit containing only pure inductance - a circuit containing only pure capacitance	Find the phase angle between voltage and current for each circuit with examples	Lecture + Laboratory	Short exam + Practical assessment
13	**4**	The effect of alternating current in circuits and methods of connecting them	Series and parallel connection	Lecture + Laboratory	Short exam + Practical assessment
14	**4**	Effect of alternating current on a circuit containing a resistance and an inductor in parallel - A circuit containing a resistance and a capacitor in parallel	Find the relationship between voltage and current in the three cases - phase angle	Lecture + Laboratory	Oral exam + Practical evaluation
15	**4**	Use the OPERATOR-J or complex operator to find the total impedance, total permittivity, current, voltage and phase angle of circuits.	Connecting impedances in series and in parallel with solving examples	Exam	Exam

16	**4**	Resonant circuits including - Series resonant circuit - Definition of resonance and how to reach it - Calculating current, voltage, impedance, phase angle and frequency at resonance	Calculate current, voltage, impedance, phase angle and resonant frequency.	Lecture + Laboratory	Oral exam + Practical evaluation
17	**4**	Application of theories	Learn about AC circuits with examples	Lecture + Laboratory	Oral exam + Practical evaluation
18	**4**	Power in AC circuits, including power calculation in circuits containing only resistance.	Circuit containing resistance, inductance and capacitor	Lecture + Laboratory	Oral exam + Practical evaluation
19	**4**	Total apparent power (definition) - How to draw a power triangle - Power factor	Definition and effect on AC circuits	Lecture + Laboratory	Oral exam + Practical evaluation
20	**4**	Maximum possible power transfer theory in AC circuits	Derivation of its relations	Lecture + Laboratory	Oral exam + Practical evaluation
21	**4**	Electrical network analysis by node voltage method	Node voltage equations	Lecture + Laboratory	Oral exam + Practical evaluation
22	**4**	Practical examples of electrical network analysis using the node method	Electrical network analysis	Lecture + Laboratory	Oral exam + Practical evaluation
23	**4**	Three-phase AC circuits - definition and how to generate single-phase, two-phase and three-phase AC current	Special relations for calculating line and phase current and voltage	Lecture + Laboratory	Oral exam + Practical evaluation
24	**4**	Solving practical examples about three-phase alternating current	Triangle and star connection	Lecture + Laboratory	Oral exam + Practical evaluation
25	**4**	Power measurement methods for three-phase loads - wattmeter	Power measurement using wattmeter and voltage	Lecture + Laboratory	Short exam + Practical assessment

26	**4**	Transient Circuits - DC Transients	Transient Circuits RL Circuit RC-RLC Circuit	Lecture + Laboratory	Short exam + Practical assessment
27	**4**	Transient Circuits - RL, RC, RLC - Transient Currents	DC Transients	Lecture + Laboratory	Short exam + Practical assessment
28	**4**	Self-inductance of the coil (Electromagnetic induction)	Special relations to find the self-inductance of the coil	Lecture + Laboratory	Short exam + Practical assessment
29	**4**	Transformers - Transformer Installation - Transformer Drawing - Its Features	Its working principle and special relationships	Lecture + Laboratory	Short exam + Practical assessment
30	**4**	Types of transformers and solving examples	Transformers	Exam	Exam

11. Infrastructure	
1. Required textbooks	A methodological book on circuits and measurements, and any new lectures prepared by the instructor + a laboratory experiments booklet.
2. Main References (Sources)	Modern books, courses, software and websites related to circuits and measurements.
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet.
B. Electronic references and websites	Resources available on engineering materials properties websites 1. Laboratory booklet 2. Principles of Electrical Engineering Written by Dr. Muhammad Zaki _ Dr. Muzaffar Anwar.
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Digital Circuits - **Log1**
4. Available forms of attendance	Class
5. Semester/year	First Year
6. Number of academic hours (total)	30 * 4 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To enable the student to understand the digital and logical circuits that are involved in the construction of the electronic computer and control circuits.	
Special objective: To introduce the student to digital and logical circuits, how to build them, how they work, and their applications, such as arithmetic and logic circuits, counters, shift registers, memory, etc.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student gets to know the basic concepts.
2. Get to know the types of electronic components.
3. The student learns how to use the laws.
4. Design digital circuits.

B. Course-specific skill objectives

1. Practical application of concepts.
2. Analysis and interpretation.
3. Circuit design.
4. Use of tools.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue and participate in work groups that develop teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and qualifying skills transferred (other skills related to employability and personal development)

1. Using ready-made systems such as (AutoCAD. Multisim ....).
2. Acquiring skill in using different types of electrical circuits and methods of analyzing them mathematically.
3. Knowing the operation of rectifiers and inverters and how to maintain them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1 + 2 + 3 + 4	**4**	Number systems - Binary, Decimal, Octal, Hexadecimal, Converting from Binary to Decimal and vice versa. Converting from Decimal to Octal, Converting from Decimal to Hexadecimal and vice versa	Convert from hexadecimal to binary and vice versa	Lecture	Oral evaluation
5 + 6 + 7	**4**	Logic gates, basics of logic gates - AND gate OR gate NOT gate	Using a transistor, NAND gate	Lecture + Lab	Oral exam + Practical evaluation
8 + 9	**4**	Simplify logic circuits using Boolean algebra, write the logical equation from the reality table, either using sum product or sum of product.	Use different gates and find their truth table.	Lecture + Lab	Short exam + practical assessment
10 + 11 + 12	**4**	Karnaugh Map - Karnaugh Map for Two Variables Karnaugh Map for Three Variables Karnaugh Map for Four Variables	Simplifying Logic Circuits Using Karnaugh Maps	Lecture + Lab	Oral assessment + short exam
13	**4**	Digital Comparator - Single Order Double Order Digital Comparator	Comparative	Lecture + Lab	Short exam + practical assessment
14	**4**	Decoder Binary to Octal Decoder Binary to Decimal Decoder and vice versa	Decoder	Lecture + Lab	Short exam + practical assessment
15	**4**	Encoding Octal to Binary Encoding Decimal to Binary Encoding	Types of coding	Exam	Exam
16 + 17 + 18	**4**	Semi-inclusive circle Semi-subtractor circles Perfect adder circle Perfect subtractor circle	Study of circles	Lecture + Lab	Short exam + practical assessment

19	**4**	Swings _ Swing (RS) _ Swing (JK) _ Swing (D) Swing (T)	Add pulse control	Lecture + Lab	Short exam + practical assessment
20	**4**	JK Swing Black - Comparing Different Swings Examples of Swing Attachments	Input and output pulses dependence	Lecture + Lab	Short exam + practical assessment
21	**4**	Counters (general idea)	Ascending wave counter	Lecture + Lab	Short exam + practical assessment
22	**4**	Ascending and descending wave counter.	Synchronous series counter	Lecture + Lab	Short exam + practical assessment
23	**4**	Parallel synchronous counter Common integrated circuits for counters.	Binary Divider.	Lecture + Lab	Short exam + practical assessment
24	**4**	Displacement Records.	Displacement Records.	Lecture + Lab	Short exam + practical assessment
25	**4**	Memory circuits: Type (Ram: Rom) Memory description, Memory capacity.	Block diagram of the main types of memory electronic circuits.	Lecture + Lab	Short exam + practical assessment
26	**4**	Introduction / Converting digital values to (DAC) theory	Resistor Network Type Accuracy Precision	Lecture + Lab	Oral exam + Practical evaluation
27 + 28 29 + 30	**4**	Conversion from theoretical to digital (ADC) using the (Immediate) method by the comparative method.	ADC using ascending counter ADC using ascending counter.	Lecture + Lab	Oral exam + Practical evaluation

11. Infrastructure	
1. Required textbooks	A textbook on electronic circuits and any new lectures prepared by the instructor + a laboratory experiments booklet.
2. Main References (Sources)	Modern books, courses, software and websites related to digital circuits.
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet.
B. Electronic references and websites	- Resources available on engineering materials properties websites - Digital Circuits Book Prof. Dr. Muhammad Al-Adwy.
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Mathematics- **Math**
4. Available forms of attendance	Class
5. Semester/year	First Year
6. Number of academic hours (total)	30 * 2 = 60
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To help the student understand the laws and mathematical problems necessary for the purpose of solving simple and complex electrical circuits**.**	
Specific Objective: The student will be able to: **1.** Understand the basic principles and theories of mathematics. **2.** Solve and apply equations. **3.** Understand some mathematical concepts such as the relationship, function and trigonometric functions.	

9. Course outcomes, teaching, learning and assessment methods

A. Cognitive objectives

1. The student will learn the basic concepts.
2. Learn mathematical equations.
3. The student will learn how to use laws to solve problems.

B. Course Skill Objectives

1. Practical application of mathematical concepts.
2. Analysis of equations.
3. Use mathematical laws to solve equations.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue and participate in work groups that develop teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and transferable skills (other skills related to employability and personal development)

1. Communication skills such as oral communication and intellectual communication.
2. Teamwork skills, cooperation with others and the ability to negotiate.
3. Continuous learning skills such as the desire to acquire new knowledge.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**2**	Matrices Determinants Various Applications	Matrices	Lecture	Short exam
2	**2**	Solving Linear Equations Trammer's Method Applications of Determinants	Finding the value of currents in multiple electrical circuits	Lecture	Short exam
3	**2**	Vectors Vector Analysis Vector and Scalar Quantities Phase Vector Algebra Finding the Resultant of Vector Quantities	Vectors and their analysis	Lecture	Short exam
4	**2**	Orthogonal Vectors Vector Scale Scalar and Cross Product	Applications of Magnetic Flux Vectors - Maxwell	Lecture	Short exam
5	**2**	Function Trigonometric functions and trigonometric relations	Functions	Lecture	Short exam
6	**2**	Exponential Function Hyperbolic Functions	Drawing functions	Lecture	Short exam
7	**2**	Goals The goal of algebraic and trigonometric functions	Applications on goals	Lecture	Short exam
8	**2**	Differentiation Derivative Derivative of algebraic functions	Chain Rule Constructing a Differential Circuit	Lecture	Short exam
9	**2**	implicit function Standard function	higher order derivative	Lecture	Short exam
10	**2**	Derivative of Trigonometric Functions Derivative of Logarithmic Functions	Calculate the effective value of current	Lecture	Short exam
11	**2**	Derivative of exponential function Derivative of hyperbolic functions Calculating time constant	derivative of functions	Lecture	Short exam

12	**2**	Derivative Applications Tangent and Normal Equations Velocity and Acceleration	Circle response drawing	Lecture	Short exam
13	**2**	Increase and decrease Maximum and minimum limits Inflection points	Drawing functions	Lecture	Short exam
14	**2**	Physical applications	General Engineering	Lecture	Short exam
15	**2**	Integration Indefinite Integration	Algebraic and logarithmic functions	Lecture	Short exam
16	**2**	Integration of exponential and trigonometric functions	Integration of functions	Lecture	Short exam
17	**2**	Definite Integration Applications of Definite Integration Area Under a Curve	area between two curves	Lecture	Short exam
18	**2**	Rotational volumes	Arc length of curve	Lecture	Short exam
19	**2**	Physical applications	Engineering (work-torque-momentum-moment of inertia)	Lecture	Short exam
20 + 21	**2**	General methods of integration include substitution and partitioning.	Using partial, exponential and logarithmic fractions	Lecture	Short exam
22	**2**	Integral equations	Amplifier circuit using integrated circuit	Lecture	Short exam
23	**2**	Numerical methods in integration Trapezoidal rule Simpson's rule	Finding distance from acceleration and velocity	Lecture	Short exam
24 + 25	**2**	Solving discrete, homogeneous and linear differential equations	Its various applications within the field of specialization.	Lecture	Short exam
26	**2**	Complex numbers Addition, subtraction, multiplication and division	geometric representation of complex number.	Lecture	Short exam
27	**2**	Polar Formula Converting algebraic formula to polar and vice versa Relationship of	Exponential formula for transforming complex de Dumes theorem.	Lecture	Short exam

		coefficient (n) to electronic circuits			
28	**2**	Powers and Roots Representing Roots	Finding the roots.	Lecture	Short exam
29	**2**	Statistical Operations Frequency Distributions Frequency Histogram	recurrence curve.	Lecture	Short exam
30	**2**	Mean Rate Standard Deviation Variance Relative Dispersion	The relationship between the mean, median and mode.	Lecture	Short exam

11. Infrastructure	
1. Required textbooks	A textbook on electronic circuits and any new lectures prepared by the instructor + a laboratory experiments booklet
2. Main References (Sources)	Modern books, courses and websites on mathematics
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet
B. Electronic references and websites	Resources available on engineering materials properties websites. 1. From Schaum's series (Solving Electrical Circuits) by Joseph A. 2. Methods for Solving Differential Equations by: Khaled Ahmed Al-Samarrai - Yahya Abdul Saeed 3. Calculus (Thomas) 4. Laplace Transformation.
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Computer Applications/1- **Cop/1**
4. Available forms of attendance	Class
5. Semester/year	First Year
6. Number of academic hours (total)	30 * 1 = 30
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: The student should be able to: Use ready-made systems on modern computers and apply them in his field of specialization and benefit from them.	
Specific Objective: The student will be able to use the calculator and application on MSDOS and Windows.	

9. Course outcomes, teaching, learning and assessment methods

A. Cognitive objectives

1. The student will learn about the components of the computer and how they work.
2. The student will understand how the computer works.
3. The student will learn how to use application programs.
4. The ability to provide the basic principles for using technological tools.

B. Course specific skill objectives

1. The student acquires the skill of learning the basic principles of computers, operating systems and their types.
2. The student acquires the skill of formatting and arranging texts.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and transferable skills (other skills related to employability and personal development)

1. Developing the student to generate new and innovative ideas and solve problems in unconventional ways.
2. Developing the student’s knowledge of using technology and how to deal with its tools and applications.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1 + 2	**1**	The student learns about the parts of the computer, how to use them, their specifications, and learns about operating systems, comparing them, and learning about them.	Computer Basics	Lecture	Short exam
3 + 4	**1**	- The student learns about files, folders and their hierarchy. - Learn about memory, its types and components of external storage.	Computer Basics	Lecture + Lab	Oral exam + Practical evaluation
5 + 6	**1**	The student learns about files and directories and how to review them - He learns about command applications MS-DOS CLS-VER	MS-DOS	Lecture	Short exam + practical assessment
7 + 8	**1**	The student learns about the applications of the commands related to creating directories - Naming files - Renaming files Types of disks, types of disk drives, formatting disks Using the Format command	MS-DOS	Lecture + Lab	Oral assessment + short exam
9 + 10	**1**	The student learns about applications and instructions Checklist Pack up Tree	MS-DOS	Lecture	Short exam + practical assessment
11 + 12	**1**	The student learns about path, Ver and path handling instructions.	MS-DOS	Lecture + Lab	Short exam + practical assessment
13 + 14	**1**	The student learns how to operate the Windows system - Learn about the contents of the desktop - Applications in using Windows - Using the Mouse - Applications on files in the Windows system - Opening files, changing their names, cloning them, and finishing work	Windows	Lecture	Short exam + practical assessment
15 + 16	**1**	Introduces the student to the Microsoft Word system: includes an introduction to the program and an explanation of the menus and their contents.	Word	Lecture	Oral assessment + short exam

17 + 18	**1**	The student learns about the instructions for dealing with paragraphs, their formatting, and the process of searching and switching for a specific text.	Word	Lecture	Short exam + practical assessment
19 + 20	**1**	- The student learns about page formatting, numbering, and adding footnotes to them. - Creating and formatting tables and controlling the addition and deletion of columns and rows.	Word	Lecture + Lab	Short exam + practical assessment
21 + 22	**1**	- Introducing the student to the Microsoft Word system: Includes an introduction to the program and an explanation of the menus and their contents. - Instructions for dealing with paragraphs and their formatting.	Word	Lecture	Oral assessment + short exam
23 + 24	**1**	- The student learns about the process of searching and switching a specific text and changing the text from Arabic to English - Formatting and numbering pages and adding a footnote	Word	Lecture	Short exam + practical assessment
25 + 26	**1**	- The student learns how to create and format tables and control adding and deleting columns and rows. - Microsoft Word system: includes an introduction to the program and an explanation of the lists and their contents.	Word	Lecture	Oral assessment + short exam
27 + 28	**1**	The student learns about the instructions for dealing with paragraphs and their formatting. - The process of searching and switching a specific text and changing the text from Arabic to English.	Word	Lecture + Lab	Short exam + practical assessment
29 + 30	**1**	The student learns about page formatting, numbering, and adding footnotes to them. - Creating and formatting tables and controlling the addition and deletion of columns and rows.	Word	Lecture	Oral assessment + short exam

11. Infrastructure	
1. Required textbooks	Textbook and computer notebook
2. Main References (Sources)	Operating System Management (MSDOS 6) DOS Dr. Farid Fahmy Ziyada How to use the computer and the Internet - Hussam Al-Mustarihi Windows 89 WINDOWS - Muhammad Jamal Muhammad
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet
B. Electronic references and websites	https://www.geeksforgeeks.org/basic-applications-of-computers

12. Curriculum Development Plan
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.

Course Description Form

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1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Engineering Drawing- **Drw**
4. Available forms of attendance	Class
5. Semester/year	First Year /First Semester
6. Number of academic hours (total)	15 * 3 = 45
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: Training the student on engineering tools.	
Specific objective: The student will be able to: Train the student on engineering tools and methods of using them in engineering views and projections.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student will learn about the basic tools of engineering drawing.
2. The student will learn how to use engineering tools.
3. The student will learn how to draw engineering diagrams.

B. Course Skill Objectives

1. Practical application of engineering drawing concepts
2. Development of engineering drawing skills
3. Application of engineering standards
4. Analysis of drawings

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional and value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue and participate in work groups that develop teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and transferable skills (other skills related to employability and personal development)

1. Communication skills such as oral communication and intellectual communication.
2. Teamwork skills, cooperation with others and the ability to negotiate.
3. Continuous learning skills such as the desire to acquire new knowledge.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**3**	The importance of engineering and industrial drawing - Drawing tools and their uses - Conventional drawing dimensions	Point, line and surface definitions	Laboratory	Practical evaluation
2	**3**	Drawing types of lines	Extension line (drawing board)	Laboratory	Practical evaluation
3	**3**	Drawing a painting on the lines	Fonts panel	Laboratory	Practical evaluation
4	**3**	Writing Latin letters and numbers	Writing letters	Laboratory	Practical evaluation
5	**3**	Drawing a board that includes writing numbers and letters vertically, then tilted at a 75-degree angle, in sizes from mm to 10 mm	Continuation of the previous panel	Laboratory	Practical evaluation
6	**3**	Geometric operations include: 1. Dividing a line into equal and unequal proportions 2. Bisecting a line	Engineering operations	Laboratory	Practical evaluation
7	**3**	Drawing tangents to circles: 1. Draw an arc that touches two known circles from the inside 2. Draw an arc that touches two known circles from the outside 3. Draw a straight line that touches two known circles from the outside	Drawing tangents to a circle	Laboratory	Practical evaluation
8	**3**	- Drawing a regular pentagon with the diameter of the circle. - Drawing a circle in perspective at a 30-degree angle.	Drawing a regular polygon	Laboratory	Practical evaluation
9	**3**	Drawing a simple figure at a 30- and 45-degree angle	Drawing a solid shape	Laboratory	Practical evaluation
10	**3**	Draw a painting that includes two perspectives, with all dimensions placed in a geometric way.	Dimensions mode explanation	Laboratory	Practical evaluation
11	**3**	Draw a painting that includes two perspectives and write the dimensions in a geometric way	Draw a banner that includes both perspectives when	Laboratory	Practical evaluation

			viewing the dimensions in a geographic area.		
12	**3**	Drawing complex perspective that contains cylindrical shapes or cavities	Continuation of the previous topic with a drawing of a painting	Laboratory	Practical evaluation
13	**3**	Applications on drawing projections with different perspectives	Projection drawing	Laboratory	Practical evaluation
14	**3**	Projection drawing	perspective drawing	Laboratory	Practical evaluation
15	**3**	Cutting in objects, cutting angle - cutting lines (defamation) Definition of parts not cut (focuses on complete cuts only) Plate including projections after cutting	Definition of parts A board that includes projections after cutting.	Laboratory	Practical evaluation

11. Infrastructure	
1. Required textbooks	A methodical book in engineering drawing and any new lectures prepared by the instructor.
2. Main References (Sources)	Modern books, courses, software and websites related to engineering drawing.
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet.
B. Electronic references and websites	Resources available on engineering materials properties sites 1. Descriptive Geometry - Medhat Faisal Fadil - Al-Zaman Press 1977 2. Descriptive Geometry - Mohamed Amin Wahib / Faculty of Engineering 3. /Ain Shams University Engineering Drawing & Graphic Technology “frend” – McGraw–Hill 1976 Engineering & drawing Technology “A.W – Wander Willia – McGraw 1977
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student’s knowledge of the study material and consolidate its concept.	

Course Description Form

Course Description

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1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Electrical drawing - **Drw**
4. Available forms of attendance	Class
5. Semester/year	First Year / Second Semester
6. Number of academic hours (total)	15 * 3 = 45
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: Training the student to read electrical maps.	
Specific Objective: The student will be able to: Design electrical maps containing electrical switches, integrated circuits, electric motors and ink the maps.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student will learn the basics of electrical drawing.
2. The student will learn how to draw electrical diagrams.
3. The student will learn how to use engineering programs.

B. Course Skill Objectives

1. Drawing diagrams.
2. Circuit analysis.
3. Circuit design.
4. Using measuring tools.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional and value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue and participate in work groups that develop teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and transferable skills (other skills related to employability and personal development)

1. Communication skills such as oral communication and intellectual communication.
2. Teamwork skills, cooperation with others and the ability to negotiate.
3. Continuous learning skills such as the desire to acquire new knowledge.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**3**	Electrical and electronic symbols explained	Electrical symbols	Lecture + Lab	Practical assessment
2	**3**	Electrical and electronic symbol board drawing	Drawing icons	Lecture + Lab	Practical assessment
3	**3**	Explaining how to distribute and install measuring devices (ammeter, voltmeter, and ohmmeter)	How to distribute measuring devices	Lecture + Lab	Short exam + Practical assessment
4	**3**	Drawing of electrical installations for a room with an attached storeroom	Drawing a foundation board	Lecture + Lab	Practical assessment
5	**3**	Drawing of a complete fluorescent tube wiring diagram	Complete wiring diagram	Lecture + Lab	Short exam + Practical assessment
6	**3**	Drawing of an electronic wiring board containing a set of electronic circuits	electronic connection board	Lecture + Lab	Practical assessment
7	**3**	Drawing of a circuit board containing gates	electronic circuit drawing	Lecture + Lab	Short exam + Practical assessment
8	**3**	Drawing a circuit board containing integrated circuits	electronic circuit drawing	Lecture + Lab	Practical assessment
9	**3**	Drawing of a circuit board containing gates and integrated circuits	painting a gate	Lecture + Lab	Short exam + Practical assessment
10	**3**	Drawing a board to control the speed of a three-phase motor	drawing control panel	Lecture + Lab	Practical assessment
11	**3**	Explaining how to read a map or a set of maps for electrical circuits	Explain how to read a map	Lecture + Lab	Practical assessment
12	**3**	Introducing the student to	Use ink pens	Lecture	Short exam

		how to use ink pens		+ Lab	+ Practical assessment
13	**3**	Drawing parts of a circuit diagram containing electrical or electronic components	Electronic circuit map	Lecture + Lab	Short exam + Practical assessment
14	**3**	Electrical installations	Wiring	Lecture + Lab	Practical assessment
15	**3**	Full connections	Linking sources	Lecture + Lab	Exam

11. Infrastructure	
1. Required textbooks	A methodical book in engineering drawing and any new lectures prepared by the instructor.
2. Main References (Sources)	Modern books, courses, software and websites related to engineering drawing.
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet.
B. Electronic references and websites	Resources available on engineering materials properties sites 1. Descriptive Engineering - Medhat Faisal Fadil - Al-Zaman Press 1977. 2. Descriptive Engineering - Mohamed Amin Wahib / Faculty of Engineering / Ain Shams University. 3. Engineering Drawing & Graphic Technology ((Friend)). 4. Engineering Drawing Technology - McGraw - Hill 1977. 5. Electrical Connections in Lighting and Power. 6. ((E.P Anderman - 1977)).
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Workshops - **Work/1**
4. Available forms of attendance	Class
5. Semester/year	First Year
6. Number of academic hours (total)	30 * 4 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To provide the student with manual experience and practical proficiency.	
Specific objective: The student will be able to: Gain the student manual experience and practical proficiency.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student gets to know the basic concepts of the laboratory material.
2. Get to know how to gain experience.
3. Teach the student the importance of knowing safety in laboratories.

B. Course Skill Objectives

1. Developing practical skills.
2. Practical application of practical knowledge.
3. Safety and security.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional and value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue and participate in work groups that develop teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and transferable skills (other skills related to employability and personal development)

1. Communication skills such as oral communication and intellectual communication.
2. Teamwork skills, cooperation with others and the ability to negotiate.
3. Continuous learning skills such as the desire to acquire new knowledge.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**4**	Industrial safety principles in electrical workshops - Protection from electric shocks - Power sources.	Learn about the tools used in the electrical workshop.	Laboratory	Practical evaluation
2	**4**	How to use different types of soldering irons (with different capacities).	Spot welding irons.	Laboratory	Practical evaluation
3 + 4 + 5	**4**	Magnetic circuit - Electrical circuits - Opening the transformer - Taking information from the old transformer for the primary and secondary windings.	Electrical Transformers – Types.	Laboratory	Practical evaluation
6 + 7	**4**	Types of electric motors (single phase and three phases) Example - shaded pole motor (small water pump motor) Motor operation - disassembly - taking information - making the template - winding the coils - placing the insulators - connecting the ends - banding - varnishing - inspection and testing.	Electric motors	Laboratory	Practical evaluation
8	**4**	Electrical installations - types (virtual) - burial inside pipes - Siemens installation - drawing of a lamp installation circuit with a control circuit	Electrical installations	Laboratory	Practical evaluation
9	**4**	Drawing a circuit to establish two lamps in parallel with a switch and socket. - Practical application of the circuit. - Drawing the internal connection of the fluorescent lamp circuit.	Electrical installations	Laboratory	Practical evaluation
10	**4**	Drawing a two-way circuit (for a 2-way lamp) using a two-way switch - Practical application of the circuit.	Electrical installations	Laboratory	Practical evaluation

11	**4**	Identifying electrical sensors - their types - their uses - thermal monitoring - time position.	Electromagnetic sensors	Laboratory	Practical evaluation
12	**4**	Single-sided motor operation by antenna with push button.	Engine running	Laboratory	Practical evaluation
13	**4**	Starting a motor and changing the direction of rotation of a single-phase motor using contactors and a timer.	Engine running	Laboratory	Practical evaluation
14	**4**	Training on electrical installations (installation inside pipes).	Electrical installations	Laboratory	Practical evaluation
15	**4**	Pipe cutting process - dental work - pipe bending - using springs - (pulling springs.	Electrical pipes	Laboratory	Practical evaluation

11. Infrastructure	
1. Required textbooks	A textbook on laboratories and any new lectures prepared by the instructor + a laboratory experiments booklet.
2. Main References (Sources)	Modern books, courses, software and websites related to laboratories.
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet.
B. Electronic references and websites	Resources available on engineering materials properties websites Laboratory booklet Prepared after the approval of the Ministry of Higher Education and Scientific Research with the study plan on 6/19/1991
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Physiology - **Phis**
4. Available forms of attendance	Class
5. Semester/year	First Year
6. Number of academic hours (total)	30 * 2 = 60
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: Prepare the student to study and understand medical devices by explaining the physiological changes, especially electrical ones, that occur when measuring the various organs of the body and their function and their relationship to the devices used to measure and diagnose various phenomena and diseases.	
Specific objective: The student will be able to: Prepare the student to study and understand medical devices by explaining the physiological changes, especially electrical ones, that occur when measuring the various organs of the body and their function and their relationship to the devices used to measure and diagnose various phenomena and diseases.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student will learn to understand medical devices and physiological changes.
2. The student will learn about cells and tissues.
3. The student will learn about the basic laws that govern the functions of the body.

B. Course Skill Objectives

1. Applying physiological concepts.
2. Developing the ability to use technology and modern tools.
3. Acquiring students to conduct physiological experiments.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional and value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue and participate in work groups that develop teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and transferable skills (other skills related to employability and personal development)

1. Communication skills such as oral communication and intellectual communication.
2. Teamwork skills, cooperation with others and the ability to negotiate.
3. Continuous learning skills such as the desire to acquire new knowledge.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1 + 2	**2**	Muscle tissue - Types of muscles (skeletal - striated - visceral).	Muscle tissue	Lecture	-
3 + 4	**2**	Effect of successive stimuli on muscle contraction.	Muscle pain Muscle strain	Lecture	Short exam
5 + 6	**2**	Sensory nervous system (parts - functions - functional areas of the brain - transmission of stimuli).	sensory nervous system	Lecture	Short exam
7 + 8	**2**	Autonomic nervous system (sympathetic nervous system and parasympathetic nervous system).	Autonomic nervous system	Lecture	Short exam
9 + 10	**2**	Circulatory system (heart - its structure - its function - and its importance - heartbeats) - blood vessels.	Circulatory system (heart - its structure - its function - and its importance - heartbeats) - blood vessels	Lecture	Short exam
11 + 12	**2**	Blood pressure - measuring it - its importance The role of blood in the body.	blood pressure	Lecture	Short exam
13 + 14	**2**	Respiratory system (breathing - types of breathing - blood work in the respiratory system - cavity pressure).	Respiratory movements	Lecture	Short exam
15 + 16	**2**	Lung expansion - respiratory capacity - vital capacity - components of inspired air.	Lung	Lecture	Short exam
17 + 18	**2**	The digestive system (its structure - its parts - its importance - digestive glands - the liver - digestive secretions - stages of digestion).	Digestive system	Lecture	Short exam
19 + 20	**2**	Carbohydrate digestion - Protein digestion - Fat digestion - Absorption - Metabolism – Defecation.	carbohydrate digestion	Lecture	Short exam
21 + 22	**2**	Kidney - Ureter - Bladder - External opening) Formation of the parts of the	urinary system	Lecture	Short exam

		system - Importance of the urinary system.			
23 + 24	**2**	Urinary urea and urinary stones - Effect of the kidneys on blood pressure Urine components and their properties.	Urine formation	Lecture	Short exam
25 + 26	**2**	Endocrine glands - types and importance.	Endocrine glands	Lecture	Short exam
27 + 28	**2**	Endocrine - Endocrine work	Secretions	Lecture	Short exam
29 + 30	**2**	Reproductive system - its components - its functions	Reproductive system	Lecture	Short exam

11. Infrastructure	
1. Required textbooks	A methodological book in physiology and any new lectures prepared by the instructor.
2. Main References (Sources)	Modern books, courses, software and websites on physiology.
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet.
B. Electronic references and websites	Resources available websites Bioelectricity By: Mary. A. Brazier Text Book Of Physiology By: Best and Taylor Physiological Basis of Medical Practice Ninth Edition By: Jhon R. BG back-S &C. CO. New Delhi
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	Human Rights and Democracy- **Dec**
4. Available forms of attendance	Class
5. Semester/year	First year
6. Number of academic hours (total)	30 * 1 = 30
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: Enabling the student to understand human rights and practice democracy to establish a democratic society that respects human rights.	
Specific objective: **1.** Enhancing political participation. **2.** Achieving social justice. **3.** Enhancing transparency and accountability.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student learns the basic concepts.
2. Learns the mathematical equations.
3. The student learns how to use the laws to solve problems.

B. Course Skill Objectives

1. Improve the ability to express opinions and ideas.
2. Develop cultural awareness to understand and respect diversity and the rights of others.
3. Enhance the ability to work with others to achieve common goals.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional and value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue and participate in work groups that develop teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and transferable skills (other skills related to employability and personal development)

1. Communication skills such as oral communication and intellectual communication.
2. Teamwork skills, cooperation with others and the ability to negotiate.
3. Continuous learning skills such as the desire to acquire new knowledge.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1+2	**1**	Human Rights: A comprehensive view of the concept of human rights, its definition, objectives, and an introduction to the basic historical background.	human rights	Lecture	Short exam
3+4	**1**	Human rights in divine laws, especially in the Islamic religion.	Human rights in Sharia	Lecture	Short exam
5+6	**1**	Human Rights in Contemporary and Modern History International Recognition of Human Rights.	Human rights in history	Lecture	Short exam
7+8	**1**	Regional recognition of human rights.	Regional recognition.	Lecture	Short exam
9+10	**1**	NGOs and Human Rights.	Non-governmental organizations.	Lecture	Short exam
11+12	**1**	Human rights in Iraqi constitutions.	Human rights in Iraqi constitutions.	Lecture	Short exam
13+14	**1**	The relationship between human rights and public freedoms - the Universal Declaration of Human Rights and in regional charters and national constitutions.	The relationship between human rights and freedoms.	Lecture	Short exam
15+16	**1**	Economic, social and cultural human rights and civil and political human rights.	Human rights economy.	Lecture	Short exam
17+18	**1**	Modern human rights: the right to development, the right to a clean environment, and other rights.	Modern human rights	Lecture	Short exam
19+20	**1**	Guarantees of respect and protection of human rights at the national level Guarantees in the constitution, laws, etc. The role of non-governmental organizations in respecting and protecting human rights	Guarantees of respect and protection of human rights	Lecture	Short exam
21+22	**1**	Guarantees and protection of	Guarantees and	Lecture	Short exam

		human rights at the international level The role of the United Nations and its specialized agencies in providing guarantees.	protection of human rights at the international level.		
23+24	**1**	General Theory of Liberties and Origin of Rights. The Legislator's Position on Rights and Liberties.	General theory of freedoms	Lecture	Short exam
25+26	**1**	The legal basis of the rule of law.	The legal basis of the rule of law	Lecture	Short exam
27+28	**1**	Regulation of public freedoms by public authorities.	Organizing freedoms	Lecture	Short exam
29+30	**1**	The concept of equality: historical and modern development of the concept of equality.	The concept of equality	Lecture	Exam

11. Infrastructure	
1. Required textbooks	A methodological book on human rights and democracy and any new lectures prepared by the instructor.
2. Main References (Sources)	Modern books, courses and websites on human rights and democracy.
A. Recommended books and references (scientific journals, reports...)	Resources available on the Internet.
B. Electronic references and websites	Resources available on the websites of the private human rights and democracy.
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course name/code	English Language/1- **Eng/1**
4. Available forms of attendance	Class
5. Semester/year	First Year
6. Number of academic hours (total)	30 * 1 = 30
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General Objective: To qualify the student to be able to: Learn about local and international laws that deal with human rights issues.	
Specific Objective: The student will be able to: Speak English easily and can extract verbs according to their tenses.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student should become familiar with the rules of the English language and understand its basics.
2. Acquire new vocabulary that helps him in speaking and understanding comprehension passages.
3. Participate in groups in the form of dialogues to be able to practice the language.

B. Course-specific skill objectives

1. The student acquires the skills of speaking and listening.
2. Acquires the skill of forming appropriate sentences.
3. The student distinguishes between the tense in the sentence.
4. The student uses it as a second language in the field of science.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional and value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and transferable skills (other skills related to employability and personal development)

1. Providing the student with useful books, websites, and channels.
2. Using modern educational methods to deliver scientific material.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1+2	**1**	- Am/are/is, my/your - This is … - How are you? - Good morning! - What's this in English? - Numbers 1-10 - plurals	Hello!	Lecture	Direct questions + Short exams
3-4	**1**	- Countries - He/she/they, his/her - Where's he from? - Fantastic/ awful/beautiful - Numbers 11-30	Your world	Lecture	Direct questions + Short exams
5+6	**1**	- Jobs - Am/are/is - Negatives and questions - Personal information - Social expressions (1)	All about you	Lecture	Direct questions + Short exams
7+8	**1**	- Our/ their - Possessive's - The family - Has/have - The alphabet	Family and friends	Lecture	Direct questions + Short exams
9+10	**1**	- Sports/food/drinks - Present simple - a/an - languages and nationalities - numbers and prices	The way I live	Lecture	Direct questions + Short exams
11+12	**1**	- The time - Present simple - Always/sometimes/never - Words that go together - Days of the week	Every day	Lecture	Direct questions + Short exams
13+14	**1**	- Question words - Me/him/us/them - This/that - Adjectives - Can I…?	My favorites	Lecture	Direct questions + Short exams
15+16	**1**	- Rooms and furniture - There is/are - Prepositions - Directions	Where I live	Lecture	Direct questions + Short exams

17+18	**1**	- Saying years - Was/ were born - Past simple – irregular verbs - Have/do/go - When's your birthday?	Times past	Lecture	Direct questions + Short exams
19+20	**1**	- Past simple – regular and irregular - Questions and negatives - Sport and leisure - Going sightseeing	We had a great time!	Lecture	Direct questions + Short exams
21+22	**1**	- Can/can't - Adverbs - Adjective + noun - Everyday problems	I can do that!	Lecture	Direct questions + Short exams
23+24	**1**	- I'd like – some /any - In a restaurant - Signs all around	Please and thank you	Lecture	Direct questions + Short exams
25+26	**1**	- Colors and clothes - Present continuous - Opposite verbs - What's the matter?	Here and now	Lecture	Direct questions + Short exams
27+28	**1**	- Future plans - Grammar revision - Vocabulary revision - Social expressions (2)	It's time to go!	Lecture	Direct questions + Short exams

11. Infrastructure	
1. Required textbooks	New headway beginner student's book New headway beginner workbook with key
2. Main References (Sources)	Soars, J., Soars, L. (2006). New Headway beginner student's book. United Kingdom: Oxford University Press
A. Recommended books and references (scientific journals, reports...)	Audio CDs or Online Audio: Recording of listening exercises. Dialogues, and pronunciation practice
B. Electronic references and websites	New Headway Online: www.oup.com/elt/headway
12. Curriculum Development Plan	
Adding educational films related to the approved topics from YouTube, one film no longer than 15 minutes, to increase the student's knowledge of the study material and consolidate its concept.	

STAGE 2

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Electronic Medical Devices - **ElecDev**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (Total)	4 * 30 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To qualify the student to be able to use Electronic Medical Devices.	
Specific objective: The student will be able to: Maintain medical devices by studying the medical device as an electronic device and its detailed electronic circuits.	

9. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1	**4**	Introduce the student to Electronic Medical Devices and medical terminology.	Introduction to Electronic Medical Devices	Lecture + Laboratory	Oral exam
2	**4**	Introduce the student to Electronic Devices.	Definition of Electronic Devices.	Lecture + Laboratory	Short exam
3	**4**	The student learns about the circulatory system.	Circulatory system ECG machine.	Lecture + Laboratory	Practical assessment
4	**4**	The student learns about the ECG device.	ECG device.	Lecture + Laboratory	Oral exam
5	**4**	The student learns about the types of poles.	Types of poles	Lecture + Laboratory	Practical assessment
6	**4**	Blood pressure measurement	Types of blood pressure measurement	Lecture + Laboratory	Short exam
7	**4**	The student learns about the air pressure device.	Air pressure device	Lecture + Laboratory	Oral assessment
8	**4**	The student learned about the defibrillator.	Cardiac defibrillator	Lecture + Laboratory	Oral assessment + Short exam
9	**4**	The student learns about the poles of vibration devices.	Defibrillators and pacemakers.	Lecture + Laboratory	Oral assessment
10	**4**	The student learns about the pacemaker.	Defibrillators and pacemakers.	Lecture + Laboratory	Short exam

11	**4**	The student is introduced to the heart sounds device.	Heart sounds device.	Lecture + Laboratory	Oral assessment
12	**4**	The student learns about respiratory devices.	Respirators	Lecture + Laboratory	Short exam
13	**4**	The student learns about the sensors of respiratory devices.	Respiratory sensors.	Lecture + Laboratory	Oral assessment
14	**4**	The student got acquainted with the clinical monitoring devices.	Clinical Monitoring Devices.	Lecture + Laboratory	Short exam
15	**4**	The student got acquainted with the central nervous system EEG apparatus.	Central nervous system.	Lecture + Laboratory	Exam
16	**4**	The student learns about the EEG device.	EEG device.	Lecture + Laboratory	Oral assessment
17	**4**	The student learns about the sensory system.	The sense organ.	Lecture + Laboratory	Short exam
18	**4**	The student is introduced to the electromyography device.	Muscle planning device. EMG	Lecture + Laboratory	Oral assessment
19	**4**	The student got acquainted with ultrasonic devices.	Ultrasonic devices	Lecture + Laboratory	Short exam
20	**4**	The student got acquainted with the fetal monitor.	Fetal monitoring device.	Lecture + Laboratory	Oral assessment

21	**4**	The student got acquainted with the birth control device and the fetal monitoring device.	Birth control and fetal monitoring device.	Lecture + Laboratory	Oral assessment
22	**4**	The student got acquainted with the birth control device.	Birth monitor.	Lecture + Laboratory	Short exam
23	**4**		Sonar and amplifier displays.	Lecture + Laboratory	Oral assessment
24	**4**	Sonar and amplifiers display.	Sonar and amplifier displays.	Lecture + Laboratory	Oral assessment
25	**4**	The student learns about plotters and projectors.	Plotters and projectors of all kinds.	Lecture + Laboratory	Short exam
26	**4**	The student is introduced to plotting devices.	Plotter devices.	Lecture + Laboratory	Oral assessment
27	**4**	The student learns about surgical cautery devices and their electronic circuits.	Surgical cautery devices and their electronic circuits.	Lecture + Laboratory	Oral assessment
28	**4**	The student learns about surgical cautery devices and their electronic circuits.	Surgical cautery devices and their electronic circuits.	Lecture + Laboratory	Oral assessment
29	**4**	The student learns about the operating room equipment and operating room isolation.	Operating room equipment and operating room isolation.	Lecture + Laboratory	Short exam
30	**4**	The student learns about the operating room equipment and operating room isolation.	Operating room equipment and operating room isolation.	Lecture + Laboratory	Oral assessment + Short exam

10. Infrastructure	
1. Required textbooks	A textbook on Electronic Medical Devices and any new lectures prepared by the instructor + a laboratory experiments booklet.
2. Main References (Sources)	Books, periodicals, software, and modern websites related to Electronic Medical Devices.
A. Recommended books and references (scientific journals, reports, etc.)	Recent scientific research and journals in the field of specialization.
B. Electronic references, Internet sites	Websites of universities, institutes, and specialized research centers, engineering, and technical websites.
11. Curriculum Development Plan	
Searching for the latest scientific developments in this subject, collecting scientific material on Electronic Medical Devices, as well as finding sufficient sources on developments in Electronic Medical Devices to add them to the curriculum to serve its development.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Electronic Circuits - **Elecci**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	4 * 30 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To qualify the student to be able to identify: Basic Electronic Circuits and how to design them.	
Specific objective: The student will be able to: Use Electronic Circuits in various practical applications.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student will be familiar with the components of Electronic Circuits.
2. The student understands the various calculations in Electronic Circuits.
3. The student learns about the various theories in Electronic Circuit analysis.
4. The ability to provide theoretical experience.

B. Course-specific skill objectives

1. The student acquires the skill of analyzing and calculating Electronic Circuits.
2. The student acquires the skill of designing Electronic Circuits for various applications.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student’s personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and qualifying skills transferred (other skills related to employability and personal development).

1. Developing the student to think in a purely geometric way.
2. Developing the student's knowledge of Electronic Medical Devices and how to deal with them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1	**4**	Variable power supplies using (variable resistance)	Transistor, variable resistance, Arlington connection.	Lecture + Laboratory	Oral assessment
2 + 3	**4**	Voltage regulators, series regulator, parallel regulator, Darlington regulator	Mathematical equations for the change of the zir current with the change of the load current.	Lecture + Laboratory	Short exam
4	**4**	Thyristor (structure, code, characteristics) Quad-layer diode, ideal latches	(Circuit working principle, opening and closing) Thyristor firing methods, thyristor extinguishing	Lecture + Laboratory	Oral exam
5	**4**	Diac and Triac: structure /code/characteristics	Applications on (flash dim light/protection and alarm)	Lecture + Laboratory	Oral exam
6	**4**	Silicon Controlled Rectifiers (SCR) Applications	Silicon Controlled Rectifiers (SCR) Applications	Lecture + Laboratory	Short exam + Practical assessment
7 + 8	**4**	Silicon Controlled Rectifiers (SCR) Applications	(Front gain and back gain, return circuit) oscillators (phase shift, LC, Hartley, Colpitts Oscillator, Crystal)	Lecture + Laboratory	Oral assessment
9 + 10 + 11	**4**	Transistor as a switch, specifications of work on the load line, its response to a rectangular input wave, conversion crisis, various vibrators single-stable, bi-stable, unstable mathematical relations, input and output waveforms	Trigger circuits, working principle, protection against possible distortions of the output signal, pulse width control, and calculation examples.	Lecture + Laboratory	Oral assessment + Short exam
12 + 13	**4**	Mathematical relations, input and output waveforms, trigger circles.	The working idea, protection N overcomes possible distortions of the output signal.	Lecture + Laboratory	Oral assessment

14 + 15	**4**	Inverting collector circuit and output equation, non-inverting collector circuit and output equation	Mathematical examples.	Lecture + Laboratory	Oral assessment
16	**4**	Subtractor circuit, calculation equations for subtracting volti ni N0 = V2-V1	Applied circuit	Lecture + Laboratory	Short exam
17	**4**	Operational Amplifier Applications: Integrator (Circuit, Mathematical Equations, Square Wave Input and Output Wave Finding)	Input pulse wave and find output, mathematical examples	Lecture + Laboratory	Oral assessment + Short exam
18	**4**	Operational Amplifier Applications: Differentiator (Circuit, Mathematical Equations, inputting a Triangular Wave, and Finding the Output Wave)	Square wave input and output, mathematical examples	Lecture + Laboratory	Oral assessment
19	**4**	Inserting a square wave and finding the output, mathematical examples	Comparator: Circuit, its idea, inputting a triangle wave to the template input while grounding the non-template input	Lecture + Laboratory	Oral assessment
20	**4**	Linear applications of the operational amplifier, ideal rectifier, the purpose of using the operational amplifier in rectifying circuits, advantages of rectifying with operational amplifier	Comparison between the properties of an ideal and a non-ideal inductor, an ideal half-wave inductor circuit, an ideal full-wave inductor circuit, working idea, examples	Lecture + Laboratory	Short exam
21	**4**	Schmidt's Igniter, False Transformation in Comparatives and Its Prevention	Drawing transformation properties, an example of a spark plug circuit	Lecture + Laboratory	Oral assessment + Short exam
22	**4**	Wave generators use an operational amplifier, square wave generator (circuit, output frequency calculation, and circuit modulation to produce rectangular waves.	An example of circuit design	Lecture + Laboratory	Oral assessment

23	**4**	Pulse generator, oscillator, monostable	Circuit work, waveforms, equations, examples	Lecture + Laboratory	Short exam
24	**4**	Ideal wave generator	Circuit operation, waves, equations, and output frequency calculation, examples	Lecture + Laboratory	Oral assessment + Short exam
25 + 26	**4**	Analog calculator, its design, converted examples, 555 timer, its construction, its terminals , and diagrams for its use in oscillators	Equations for calculating the pulse display time converted examples	Lecture + Laboratory	Oral assessment
27	**4**	Effective RC filters of the HPE 7 LPF types	Features, properties, equations, curves, response, mathematical examples	Lecture + Laboratory	Oral assessment
28	**4**	Basic methods of manufacturing integrated circuits	Single crystal, thin film, and thick film	Lecture + Laboratory	Short exam
29	**4**	Manufacturing of an integrated circuit of an NPN transistor type	Manufacturing integrated resistors and capacitors, manufacturing an integrated circuit for a simple electronic circuit	Lecture + Laboratory	Oral assessment + Short exam
30	**4**	Manufacturing of an integrated circuit of an NPN transistor type	Manufacturing integrated resistors and capacitors, manufacturing an integrated circuit for a simple electronic circuit	Lecture + Laboratory	Oral assessment + Short exam

11. Infrastructure	
1. Required textbooks	Electronic Circuits: Authored by: Diaa Mahdi Faris, Yousef Ibrahim, Sabah Daniel Technical Education Authority / Mosul University Press / 2002.
2. Main References (Sources)	"Principles of Electronics": Authored by: Malvino / Translated by Dr. Riad Kamal, Badr Muhammad Ali Technical Education Authority / Mosul University Press.
A. Recommended books and references (scientific journals, reports, etc.)	"Electronic and audio circuits": by Zia Mahdi fares, Yasser Khalil Ibrahim n Musab Mahmoud Technical Education Authority / Mosul University Press /1991.
B. Electronic references, Internet sites	Websites of universities, institutes, and specialized research centers, engineering, and technical websites.
12. Curriculum Development Plan	
Searching for the latest scientific developments in this subject, collecting scientific material on Electronic Circuits, as well as finding sufficient sources on developments in Electronic Circuits to add them to the curriculum to serve its development.	

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Microprocesses - **Micro**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	4 * 30 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To qualify the student to be able to: Use computer shortcuts and access all applications.	
Specific objective: The student will be able to: Use the computer professionally in a manner appropriate to the specialization.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student should get to know the computer.
2. The student should get to know the nature of the work of devices and programs.
3. The student should get to know the various theories.
4. The student should be familiar with all software.

B. Course-specific skill objectives

1. The student acquires the skill of converting between systems.
2. The student acquires the skill of numerical systems.
3. The student acquires the skill of fast processors.
4. The student acquires the skill of accessing and processing input and output data.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. General and qualifying skills transferred (other skills related to employability and personal development).

1. Developing the student to think in a purely geometric way.
2. Developing the student's knowledge of Electronic Medical Devices and how to deal with them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**4**	Numerical systems: "binary, octal, decimal, hexadecimal"	Converting between systems, practical examples.	Lecture + Laboratory	Oral exam
2	**4**	Introduction to microcomputer, its terms, bit, byte, word, instruction, program, computer languages, and low-level language.	High-level language, assembly language, and machine language.	Lecture + Laboratory	Oral exam
3	**4**	Microcomputer architecture, memory unit.	Central processor unit (CPU), input-output unit and buses,	Lecture + Laboratory	Practical assessment
4	**4**	Microprocessor 8085, its components, register array.	Arithmetic and logic unit, control and command unit, instruction register	Lecture + Laboratory	Practical assessment
5	**4**	Accumulator, flag register, notification status when executing instructions.	Program counter register, pointer, stack pointer registers.	Lecture + Laboratory	Short exam
6	**4**	Addressing and its methods in the 8085 microprocessor.	Addressing and its methods in the 8085 microprocessor.	Lecture + Laboratory	practical assessment
7	**4**	Programming languages and their levels	Assembly language and its fields	Lecture + Laboratory	Oral assessment
8	**4**	Data transfer command set: clone and instant transfer	Instant download, direct download, indirect download with examples and programs for all of the above	Lecture + Laboratory	Short exam
9	**4**	Data transfer instructions set: store, stack	Examples and programs for all of the above	Lecture + Laboratory	Oral assessment
10	**4**	Data transfer instructions set	Individual instructions with examples and programs	Lecture + Laboratory	Oral assessment
11	**4**	Mathematical Operations Needs Set	Collection of all types with examples and programs	Lecture + Laboratory	Short exam

12	**4**	Mathematical Operations Instructions Set	Subtraction and its types with examples and programs	Lecture + Laboratory	Oral assessment + Short exam
13	**4**	Two sets of mathematical operation's needs.	Increase, decrease, and decimal representation with examples and programs.	Lecture + Laboratory	Oral assessment
14	**4**	Logical operation instructions set.	Logical operation instructions set.	Lecture + Laboratory	Oral assessment
15	**4**	Examples and application programs.	Examples and application programs.	Lecture + Laboratory	Oral assessment + Short exam
16	**4**	Comparison prompts with examples and programs.	Comparison prompts with examples and programs.	Lecture + Laboratory	Oral assessment
17	**4**	Rotation instruction	Examples and programs	Lecture + Laboratory	Oral assessment
18	**4**	Configure conditional options	Practical examples.	Lecture + Laboratory	Short exam
19	**4**	Loop programs.	Application programs that include the above commands.	Lecture + Laboratory	Oral assessment
20	**4**	Branch group instructions (jump, call, return).	Application programs that include the above commands.	Lecture + Laboratory	Oral assessment + Short exam
21	**4**	Instruction execution stages, instruction cycle, machine cycle.	Timing plan for executing an instruction.	Lecture + Laboratory	Oral assessment
22	**4**	Other important instructions (input, output) Interrupt control Stack.	Practical examples.	Lecture + Laboratory	Oral assessment
23	**4**	Formation and construction of delay loops (one loop, two loops, three loops).	Application programs.	Lecture + Laboratory	Short exam

24	**4**	Writing a program for an ascending counter (in machine language).	Practical example.	Lecture + Laboratory	Short exam
25	**4**	Writing a countdown program (in machine language) with an application example.	Practical example.	Lecture + Laboratory	Oral assessment
26	**4**	Write a program for a decimal counter with an applied example.	Practical example.	Lecture + Laboratory	Oral assessment
27	**4**	Practical examples of exploiting delay loops.	In industrial and engineering fields.	Lecture + Laboratory	Oral assessment
28	**4**	microprocessor architecture.	8086 General Specifications.	Lecture + Laboratory	Short exam
29	**4**	8086 Processor Addressing Instant Addressing, Register Addressing.	Direct addressing, indirect addressing, practical examples.	Lecture + Laboratory	Oral assessment + Short exam
30	**4**	8086 microprocessor instruction set.	8086 microprocessor instruction set.	Lecture + Laboratory	Oral assessment + Short exam

11. Infrastructure	
1. Required textbooks	A textbook on Microcomputer.
2. Main References (Sources)	Website.
A. Recommended books and references (scientific journals, reports, etc.)	Internet.
B. Electronic references, Internet sites	Websites of universities, institutes, and specialized research centers, engineering, and technical websites.

12. Curriculum Development Plan

Searching for the latest scientific developments in this subject, collecting scientific material on Microprocesses, as well as finding sufficient sources on developments in Microprocesses to add them to the curriculum to serve its development.

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student. It demonstrates whether the student has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Measurement devices- **Mesu**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	4 * 30 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To qualify the student to be able to: Identify the devices used to measure physical quantities.	
Specific objective: The student will be able to: **1.** Factors affecting the accuracy of readings and how to test the appropriate device and calibrate and regulate measuring devices.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student should get to know the Electronic Instrumentation.
2. The student should understand how to use the Electronic Instrumentation.
3. The student should get to know the nature of the work of Electronic Instrumentation.
4. The student should get to know their various uses.

B. Course-specific skill objectives

1. The student should gain sufficient experience in the field of Electronic Instrumentation.
2. The student should gain the skill in dealing with Electronic Instrumentation.
3. The student should gain the skill in operating and their work Electronic Instrumentation.
4. The student should gain the skill in operating the device and be familiar with all the information.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. General and qualifying skills transferred (other skills related to employability and personal development).

1. Developing the student to think in a purely geometric way.
2. Developing the student's knowledge of Electronic Medical Devices and how to deal with them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1 + 2	**4**	Definition (accuracy, degree of accuracy, rank numbers, types of errors, statistical analysis).	probability of error, specific errors.	Lecture + Laboratory	Oral exam
3	**4**	Classification of devices, pointing devices, and the principles based on them.	Acting moments (deflection moment, control moment, damping moment).	Lecture + Laboratory	Oral exam
4	**4**	Moving coil Electronic Instrumentation D'Arsonval movement	Structure, moment equations, advantages and disadvantages of moving coil Electronic Instruments.	Lecture + Laboratory	practical assessment
5	**4**	DC ammeter, ammeter with parallel comparator, DC voltmeter, voltmeter with resistance in series.	Mathematical examples for the two devices mentioned above, voltmeter sensitivity, mathematical examples.	Lecture + Laboratory	Short exam + practical assessment
6 + 7	**4**	Methods of measuring resistance, with ammeter and voltmeter, calculation examples, ammeter device, series ammeter, parallel ammeter.	Calibration of DC devices, Mujahid, calculation examples.	Lecture + Laboratory	practical assessment
8	**4**	DC bridges, Wheatstone bridge, working principle, measurement errors.	Kelvin bridge, double Kelvin bridge, mathematical examples	Lecture + Laboratory	Oral assessment
9	**4**	AC bridges and bridge balance conditions	Application of equilibrium equations	Lecture + Laboratory	Short exam
10	**4**	Inductance measurement bridges, inductance comparison bridge	Maxwell Bridge, High Bridge	Lecture + Laboratory	Oral assessment
11	**4**	Capacitance bridge, capacitance comparison bridge	Shernek Bridge, Wayne Bridge.	Lecture + Laboratory	Oral assessment

12	**4**	Wayne Bridge for Frequency Measurement.	Imbalances, How to Balance the Bridges.	Lecture + Laboratory	Short exam
13	**4**	AC measuring instruments, electrodynamometer.	Structures, moment equation.	Lecture + Laboratory	Oral assessment
14	**4**	Mobile iron measuring devices, and structures.	Moment equations, advantages, and disadvantages.	Lecture + Laboratory	Oral assessment + Short exam
15	**4**	Measuring devices are of the standard type - full wave standard.	Half Wave Rectifier – Examples.	Lecture + Laboratory	Oral assessment
16	**4**	Use of electrodynamic meter in measuring single-phase power, structures.	The angle of deviation equation.	Lecture + Laboratory	practical assessment
17	**4**	Frequency meter	Structures and working principle	Lecture + Laboratory	Short exam
18	**4**	Thermal devices, thermocouple device	Non-granular shape measurement	Lecture + Laboratory	Oral assessment
19	**4**	Plotter, block diagram, cathode ray tube, fixture, display.	Screen selection factors, screen types, eye grid.	Lecture + Laboratory	practical assessment
20	**4**	Vertical deviation system, functional diagram, input element.	Attenuator Vertical amplifier, delay line, function, and types of delay line.	Lecture + Laboratory	Oral assessment
21 + 22	**4**	Horizontal deflection system, basic sweep generator, sweep synchronization, goblet sweep, horizontal amplifier, oscilloscope models.	Passive and active solids for voltage, current, and frequency calculation.	Lecture + Laboratory	Short exam

23	**4**	Dual beam oscilloscope.	Treasurer sign maker.	Lecture + Laboratory	practical assessment
24	**4**	Electronic measuring devices, electronic voltmeter.	Basic circuit type transistor.	Lecture + Laboratory	practical assessment
25	**4**	Analog Voltmeter Selection Considerations, Input Impedance.	Voltage range, decibels, sensitivity, vs. bandwidth, current measurement.	Lecture + Laboratory	practical assessment
26 + 27	**4**	Digital Voltmeter, General Specifications Slope Type.	Type of integration: continuous equilibrium type and successive approximation type	Lecture + Laboratory	Oral assessment + Short exam
28 + 29 + 30	**4**	Simple frequency counter, display counters, time base.	Signal processing, frequency range expansion measurement, automatic meters, and calculators.	Lecture + Laboratory	Oral assessment + Short exam

11. Infrastructure	
1. Required textbooks	The textbook.
2. Main References (Sources)	Electronic Instrumentation and Measurement Techniques: Authored by Hani Aziz, Abdullah Muhammad N. Gabriel Isho Technical Education Authority / Mosul University Press / 1991.
A. Recommended books and references (scientific journals, reports, etc.)	Recent scientific research and journals in the field of specialization.
B. Electronic references, Internet sites	Websites of universities, institutes, and specialized research centers, engineering, and technical websites.

12. Curriculum Development Plan
Researching the latest scientific developments on this topic, collecting scientific material, and finding sufficient sources of developments to add them to the prescribed curriculum in a way that serves its development.

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Electromechanical Medical Devices- **MicElctroDev**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	4 * 30 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To qualify the student to be able to: Use, operate, and maintain electromechanical and laboratory devices of various types**.**	
Specific Objective: The student will be able to: **1.** Deal with most medical devices. **2.** Operate and maintain various medical devices. **3.** The ability to overcome most problems while working on the medical device.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student will learn about the components of medical devices.
2. The student will understand the principle of operation of the most important devices used in the medical field.
3. The student will understand the most important basic principles of using the medical device.

B. Course-specific skill objectives

1. The student acquires the necessary information to operate and maintain medical devices.
2. The student acquires the necessary theoretical and practical information to overcome problems during the operation of the medical device.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams
5. Class reports

C. Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams
5. Class reports

D. General and qualifying skills transferred (other skills related to employability and personal development).

1. Developing the student to think in a purely geometric way.
2. Developing the student's knowledge of Electronic Medical Devices and how to deal with them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1	**4**	The student learns the basics of medical devices.	Introduction to Electromechanical Medical Devices.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
2	**4**	The student is introduced to the X-ray machine.	X-ray machine - Principles of X-rays - Physics of X-rays and their discovery.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
3	**4**	The student learns about the components of the X-ray machine.	Components of the X-ray machine - X-ray tube.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
4	**4**	The student learns about the components of the X-ray machine.	Components of X-ray machine - high-pressure generator and control unit.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
5	**4**	The student is introduced to manual and automatic development devices.	Manual and automatic acidifiers.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
6	**4**	The student is introduced to the X-ray machine.	Radiation scanning device - generations - components.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
7	**4**	Introduce the student to viewing devices.	Viewing device - components.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
8	**4**	The student is introduced to the MRI machine.	MRI machine	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
9	**4**	The student learns about the physics of the MRI machine and its components.	Magnetic Resonance Physics - Device Components.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
10	**4**	The student learns about the dental device and its components.	Dental device - its components - air and water cycles - compressor.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams

11	**4**	The student is introduced to the dental chair and its control circuits.	Dental chair - control circuits.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
12	**4**	The student is introduced to the physiotherapy device (wax bath device).	Physiotherapy devices - wax bath devices.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
13	**4**	The student is introduced to the physiotherapy device (ultrasound device).	Physiotherapy devices - Ultrasound device.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
14	**4**	The student learned about physical therapy devices (shortwave devices and microwave devices).	Physiotherapy devices - short wave device - microwave device.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
15	**4**	The student is introduced to the physical therapy device (electrical stimulation device).	Physiotherapy Equipment - Electrostimulation Bath Device.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
16	**4**	The student is introduced to the incubator system.	Baby incubator device - systems.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
17	**4**	The student learned about the temperature control system of the incubator.	Temperature control system for the baby incubator.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
18	**4**	The student is introduced to the artificial kidney device (solution cycle).	Artificial kidney device - solution cycle.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
19	**4**	The student learns about the artificial kidney (blood circulation) device.	Artificial kidney device - blood circulation.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
20	**4**	The student learns about the industrial kidney device (types of filters).	Artificial kidney device - types of filters.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams

21	**4**	The student learned about the artificial kidney device (water filtration device).	Artificial kidney device - water filtration device.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
22	**4**	The student learns about anesthesia devices and their components.	Anesthesia Equipment - Components of the equipment - Central supply (or cylinders) of anesthesia gas.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
23	**4**	The student is introduced to the medical gas network (central oxygen system).	Medical Gas Network - Central Oxygen System.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
24	**4**	The student is introduced to central systems (nitrous oxide, compressed air, and anesthetic gas expulsion).	Central systems - nitrous oxide - compressed air - for expelling anesthetic gases.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
25	**4**	The student is introduced to laboratory equipment (centrifuge).	Laboratory equipment - centrifuge.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
26	**4**	The student is introduced to laboratory equipment (electronic balance and microscope).	Electronic balance - microscope.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
27	**4**	The student is introduced to laboratory equipment (spectrophotometer and pH meter).	Spectrophotometer - pH meter.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
28	**4**	The student is introduced to laboratory equipment (hemoglobin meter and chlorine meter).	Hemoglobin meter - Chlorine meter.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams
29	**4**	The student is introduced to laboratory equipment (auto analyzer and its	Auto analyzer - Device Components.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams

		components).			
30	**4**	The student is introduced to laboratory equipment (lithotripsy device).	Lithotripsy device.	Lecture Laboratory Summer Training	Daily Assessment Written Tests Monthly Exams Final Exams

11. Infrastructure	
1. Required textbooks	The textbook and the laboratory experiments booklet.
2. Main References (Sources)	A Text Book of Medical Instruments (S. Ananthi)
A. Recommended books and references (scientific journals, reports, etc.)	A collection of books in the field of Electromechanical Medical Devices is available on websites.
B. Electronic references, Internet sites	Viewing websites in this field.

12. Curriculum Development Plan
Updating the courses by reviewing the latest sources in the field of electromechanical medical device technologies.

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Medical Device Maintenance Workshop- **Work/2**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	4 * 30 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General objective: To qualify the student to be able to: Maintenance and operation of Electronic and Electromechanical Medical Devices, identifying their faults and treating them.	
Specific Objective: The student will be able to: - Use, operation, and maintenance of various Electromechanical and Laboratory Medical Devices types.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student should know how to maintain medical devices.
2. The student should understand how to use and maintain medical devices.
3. The student should know the causes of malfunctions.
4. The student should know the nature of the maintenance workshop work.

B. Course-specific skill objectives

1. The student should gain sufficient experience in the field of medical equipment maintenance.
2. The student should gain the skill in dealing with the medical equipment malfunction workshop.
3. The student should gain skills in operating and maintaining medical equipment.
4. The student should gain the skill of working in the maintenance workshop.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student’s personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and qualifying skills transferred (other skills related to employability and personal development).

1. Developing the student to think in a purely geometric way.
2. Developing the student's knowledge of Electronic Medical Devices and how to deal with them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1	**4**	Occupational safety of patients and staff	Occupational safety of patients and staff.	Laboratory	Short answer
2	**4**	Types of maintenance.	Types of maintenance.	Laboratory	Short answer
3	**4**	Types of faults and methods of identifying them.	Types of faults and methods of identifying them	Laboratory	Oral Exam + Practical Evaluation
4	**4**	ECG machine maintenance	ECG machine maintenance	Laboratory	Oral Exam + Practical Evaluation
5	**4**	X-ray machine maintenance	X-ray machine maintenance	Laboratory	Short exam + Practical Assessment
6	**4**	Pressure device maintenance	Pressure device maintenance	Laboratory	Short exam + Practical Assessment
7	**4**	Viewing Device maintenance	Viewing Device maintenance	Laboratory	Oral assessment + short exam
8	**4**	Scanner maintenance	MRI machine	Laboratory	Oral assessment + short exam
9	**4**	Defibrillator maintenance	Defibrillator maintenance	Laboratory	Oral assessment + short exam
10	**4**	Dental device maintenance	Dental device maintenance	Laboratory	Oral assessment + short exam

11	**4**	compressor maintenance	Dental chair	Laboratory	Oral assessment + short exam
12	**4**	Respiratory maintenance	Respiratory maintenance	Laboratory	Oral assessment + short exam
13	**4**	Wax bath machine maintenance	Clinical Monitor Maintenance	Laboratory	Oral assessment + short exam
14	**4**	Physical therapy equipment maintenance	Physical therapy equipment maintenance	Laboratory	Oral assessment + short exam
15	**4**	Baby incubator maintenance	Baby incubator maintenance	Laboratory	Oral assessment + short exam
16	**4**	EEG machine maintenance	EEG machine maintenance	Laboratory	Oral assessment + short exam
17	**4**	EMG Maintenance	EMG Maintenance	Laboratory	Oral assessment + short exam
18	**4**	Fetal monitor maintenance	Fetal monitor maintenance	Laboratory	Oral assessment + short exam
19	**4**	Artificial kidney machine maintenance	Artificial kidney machine maintenance	Laboratory	Oral assessment + short exam
20	**4**	Birth monitor maintenance	Birth monitor maintenance	Laboratory	Oral assessment + short exam

21	**4**	Sonar device maintenance	Sonar device maintenance	Laboratory	Oral assessment + short exam
22	**4**	Artificial kidney machine maintenance	Fetal monitor maintenance	Laboratory	Oral assessment + short exam
23	**4**	Sonar display device maintenance	Sonar display device maintenance	Laboratory	Oral assessment + short exam
24	**4**	Anesthesia machine maintenance	Anesthesia machine maintenance	Laboratory	Oral assessment + short exam
25	**4**	Centrifuge maintenance	Centrifuge maintenance	Laboratory	Oral assessment + short exam
26	**4**	Maintenance of devices: electronic balance and microscope	Maintenance of devices: electronic balance and microscope	Laboratory	Oral assessment + short exam
27	**4**	Spectrophotometer and PH meter maintenance	Spectrophotometer and PH meter maintenance	Laboratory	Oral assessment + short exam
28	**4**	Maintenance: Hemoglobin meter with chlorine meter	Maintenance: Hemoglobin meter with chlorine meter	Laboratory	Oral assessment + short exam
29	**4**	Autoanalyzer maintenance	Autoanalyzer maintenance	Laboratory	Oral assessment + short exam
30	**4**	Medical Surgical Equipment Maintenance	Medical Surgical Equipment Maintenance	Laboratory	Oral assessment + short exam

11. Infrastructure	
1. Required textbooks	A textbook on electronic medical devices and any new lectures prepared by the instructor + a laboratory experiments booklet.
2. Main References (Sources)	Modern books, periodicals, software, and websites related to electronic medical devices.
A. Recommended books and references (scientific journals, reports, etc.)	Recent scientific research and journals in the field of specialization.
B. Electronic references, Internet sites	Websites of universities, institutes, and specialized research centers, engineering, and technical websites.

12. Curriculum Development Plan
Researching the latest scientific developments in this topic, collecting scientific material on electronic medical devices, and finding sufficient sources on developments in electronic medical devices to add them to the prescribed curriculum in a way that serves its development.

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University – Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Computer Applications/2- **Cop/2**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	1* 30 = 30
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General Objective: To qualify the student to be able to: The student should learn the principles of computers and how to use them.	
Specific Objective: The student will be able to: - Dealing with programs, search engines, and easy access to all applications	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student should get to know the computer and its components.
2. The student should get to know the concept of networks.
3. The student should get to know how to access different applications.
4. The student should get to know search engines.

B. Course-specific skill objectives

1. To acquire the skill of professional use of the computer.
2. To acquire the skill of applying accounting programs.
3. To acquire the skill of moving between applications easily.
4. The student acquires the skill of processing using computer programs.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and qualifying skills transferred (other skills related to employability and personal development).

1. Developing the student to think in a purely geometric way.
2. Developing the student's knowledge of Electronic Medical Devices and how to deal with them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1 + 5	**3**	The concept of networks, their types, and the concept of the Internet, its operation, description of the main screen and its components, and how to deal with the World Wide Web.	Take advantage of popular search engines like Google, and Yahoo.	Lecture	Oral assessment
6 + 15	**4**	• Using some of the functions provided by the program such as Count, SQRT, Max, Sum, min, and other useful related statistical functions. • Learn about the editing process provided by the program, how to copy or transfer data, and the concept of copying arithmetic operations as well as the concept of relative cells and absolute cells. • Controlling the display of the cell: changing its style and format by using formatting tools.	Dealing with charts and how to convert numerical and textual data into charts of various types through the Chart Wizard and learning how to make the modifications and revisions provided by the program.	Lecture	Short exam + practical assessment
16	**3**	Introduction to the system - AUTOCAD components.	System operation Main menu.	Lecture	Oral assessment + short exam
17	**3**	Drawing screen components	Drawing screen components.	Lecture + Lab	Oral assessment + short exam
18	**3**	Screen Dimensions GRID - SNAP Cursor Movement.	Screen Limits - Function Keys	Lecture	Oral assessment + short exam
19	**3**	Information entry methods.	POLAR, ABSOLUTE, RELATED	Lecture	Oral assessment + short exam

20	**3**	How to deal with toolbars.	How to deal with toolbars.	Lecture + Lab	Oral assessment + short exam
21	**3**	Straight, square (LINE) drawing.	Zoom	Lecture	Oral assessment + short exam
22	**3**	Capture shapes CLOSE – VIEW – MORE – REGAN – REDRAW	ORTHO – LAST – CROSSING – WINDOW – REMOVE – PREVIOUS	Lecture	Oral assessment + short exam
23	**3**	Store design and finish work.	SAVE, END, OUT	Lecture + Lab	Oral assessment + short exam
24	**3**	Scale – SOLID INSTRUCTION	HATCH – FILL	Lecture	Oral assessment + short exam
25	**3**	Create a new drawing layer.	CHANGE LINETYPE LAYAR	Lecture	Oral assessment + short exam
26	**3**	Drawing ARC – OFFSET – HATCH – CIRCLE discs	OFFSET HATCH	Lecture + Lab	Oral assessment + short exam
27	**3**	Instructions: - ADD - TRIM - MIRROR	ADD – TRIM	Lecture	Oral assessment + short exam
28	**3**	EXTEND – FILLT	BREAK	Lecture	Oral assessment + short exam
29	**3**	Draw an electrical circuit applying the previous instructions.	Draw an electrical circuit applying the previous instructions.	Lecture	Oral assessment + short exam

30	**3**	Complete the previous diagram with the addition of TEXT writing.	Complete the previous diagram with the addition of TEXT writing.	Lecture + Lab	Oral assessment + short exam

11. Infrastructure	
1. Required textbooks	Computer curriculum book.
2. Main References (Sources)	Modern books, periodicals, software, and websites related to computers.
A. Recommended books and references (scientific journals, reports, etc.)	Recent scientific research and journals in the field of specialization.
B. Electronic references, Internet sites	Websites of universities, institutes, and specialized research centers, engineering, and technical websites.

12. Curriculum Development Plan
Researching the latest scientific developments in this topic, collecting scientific material on electronic medical devices, and finding sufficient sources on developments in electronic medical devices to add them to the prescribed curriculum in a way that serves its development.

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Control - **Contr**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	4 * 30 = 120
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General Objective: To qualify the student to be able to: Identify and understand control and automation systems.	
Specific Objective: The student will be able to: Algebra, simplify graphs and gain skill in automatic control.	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student should know the principles of control.
2. The student should know and understand automatic control.
3. The student should know the types of controls.
4. The student should know control engineering.

B. Course-specific skill objectives

1. The student acquires the skill in control engineering.
2. The student acquires sufficient skill in automatic control.
3. The student acquires the skill in the algebra of graphs.
4. The student acquires the skill of simplifying the block diagram.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and qualifying skills transferred (other skills related to employability and personal development).

1. Developing the student to think in a purely geometric way.
2. Developing the student's knowledge of Electronic Medical Devices and how to deal with them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1	**4**	Introduction and definition of control engineering.	Open Circuit and Closed Circuit _ Examples	Lecture + Lab	Oral assessment
2	**4**	Control Systems - The Need for Automatic Control.	Types of automatic control.	Lecture + Lab	Short exam
3	**4**	The basic form of control system.	Block diagram _ Transformation function.	Lecture + Lab	Oral exam + Practical evaluation
4 + 5	**4**	Block diagram algebra and its laws.	Simplify complex block diagram	Lecture + Lab	Oral exam + Practical evaluation
6	**4**	Multi-input and multi-output systems.	Multi-input and multi-output systems.	Lecture + Lab	Short exam + practical assessment
7	**4**	Signal flowcharts.	Mason's method - its rules.	Lecture + Lab	Oral assessment + short exam
8	**4**	Extracting the transformation function using Meissen's method – Examples.	Extracting the transformation function using Meissen's method.	Lecture + Lab	Oral assessment + short exam
9 + 10	**4**	Physical Systems _ Electrical and Mechanical System _ Extracting Transformational Functions of the System.	Theories of compatibility between systems.	Lecture + Lab	Oral assessment + short exam
11 + 12	**4**	Laplace Transform - Transform Theorems _ Inverse Laplace Transform.	Using Transformation to Solve Differential Equations.	Lecture + Lab	Oral assessment + short exam
13 + 14	**4**	Analog Calculator _ Using Operational Amplifier in Analog Calculator.	Solving differential equations using the analog calculator.	Lecture + Lab	Oral assessment + short exam

15	**4**	Comparison of analog circuits.	Electronic Circuits _ modeling.	Lecture + Lab	Oral assessment + short exam
16	**4**	Types of input signals.	Stability and system type.	Lecture + Lab	Oral assessment + short exam
17 + 18	**4**	Stability _ S-level identification Identify poles and zeros of the S-level control system and determine stability.	Stability.	Lecture + Lab	Oral assessment + short exam
19 + 20	**4**	Routh's Stability Scale - Scale Theories	Using the scale to find the limits of stability _ Examples	Lecture + Lab	Oral assessment + short exam
21	**4**	Response - Transient response and its classification into temporal and frequency	Time response of a first-order system	Lecture + Lab	Oral assessment + short exam
22 + 23	**4**	Time response of a second-order system Factors determining the stability in time	Adverb of use _ examples	Lecture + Lab	Oral assessment + short exam
24 + 25	**4**	Frequency response and its types _ examples	Frequency response and its types _ examples	Lecture + Lab	Oral assessment + short exam
26 + 27	**4**	Its uses in control systems and its impact on system performance	Electronic controllers and their types	Lecture + Lab	Oral assessment + short exam
28 + 29	**4**	Error Rate _ Types of Error in the System	How to calculate it	Lecture + Lab	Oral assessment + short exam

30	**4**	How to solve roots _ Rules curve for this method _ Examples	How to solve roots	Lecture + Lab	Oral assessment + short exam

11. Infrastructure	
1. Required textbooks	A textbook on electronic medical devices and any new lectures prepared by the instructor + a laboratory experiments booklet.
2. Main References (Sources)	Modern books, periodicals, software, and websites related to electronic medical devices
A. Recommended books and references (scientific journals, reports, etc.)	Recent scientific research and journals in the field of specialization
B. Electronic references, Internet sites	Websites of universities, institutes, specialized research centers, engineering and technical websites

12. Curriculum Development Plan
Researching scientific developments in this topic, collecting scientific material on control, and finding sufficient sources on developments in control devices to add them to the prescribed curriculum in a way that serves its development.

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Programmable Logic Control (PLC) 2nd semester - **PLC**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	3* 15 = 45
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General Objective: To qualify the student to be able to: Product Application Ranges	
Specific Objective: The student will be able to: Register Word Formats	

9. Course outputs and methods of teaching, learning, and evaluation

A. Cognitive objectives

1. The student should know the basics of logical control.
2. The student should know the principles of programmed control.
3. To know how to use it.
4. To know the ways to connect to it.

B. Course-specific skill objectives

1. The student acquires the skill of using logical control.
2. The student acquires the skill of accessing programmed control.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

C. Emotional & value-based objectives

1. Developing the student's personality.
2. Motivating the student to engage in dialogue.
3. Motivating the student to participate in work groups that develop teamwork.
4. Equipping the student with sufficient information about teamwork.

Teaching and learning methods

(Lectures, Laboratories, Workshops, Summer Training, Projects)

Evaluation methods

1. Oral examinations
2. Daily exams
3. Monthly exams
4. Final exams

D. General and qualifying skills transferred (other skills related to employability and personal development).

1. Developing the student to think in a purely geometric way.
2. Developing the student's knowledge of Electronic Medical Devices and how to deal with them.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1	**3**	Chapter 1 Introduction to Programmable Controllers.	A Historical Background	Lecture + Lab	Oral assessment
2	**3**	Number Systems and Codes.	Number conversions	Lecture + Lab	Short exam
3	**3**	Chapter 3 Logic Concepts	The Binary Concept	Lecture + Lab	Oral exam + Practical evaluation
4	**3**	Processors, the Power Supply	Programming Devices	Lecture + Lab	Oral exam + Practical evaluation
5	**3**	The Memory System and I/O Interaction	Memory Overview	Lecture + Lab	Oral exam + Practical evaluation
6	**3**	Configuring the PLC Memory	Summary of Memory	Lecture + Lab	Oral assessment + Short exam
7	**3**	The Discrete Input/Output System	Introduction to Discrete I/O Systems	Lecture + Lab	Oral assessment + Short exam
8	**3**	PLC Instructions for Discrete Outputs	Discrete Outputs	Lecture + Lab	Oral assessment + Short exam
9	**3**	The Analog Input/Output System	Overview of Analog Input Signals	Lecture + Lab	Oral assessment + Short exam
10	**3**	Instructions for Analog Output Modules	Analog Output Data Representation	Lecture + Lab	Oral assessment + Short exam

11	**3**	Special Function I/O and Serial Communication Interfacing	Introduction to Special I/O Modules	Lecture + Lab	Oral assessment + Short exam
12	**3**	Programming Languages	Types of PLC Languages	Lecture + Lab	Oral assessment + Short exam
13	**3**	Counter Instructions	Program/Flow Control Instructions	Lecture + Lab	Oral assessment + Short exam
14	**3**	System Documentation	Steps for Documentation	Lecture + Lab	Oral assessment + Short exam
15	**3**	Start-Up and Maintenance	Power Requirements and Safety Circuitry	Lecture + Lab	Oral assessment + Short exam

11. Infrastructure	
1. Required textbooks	methodical book
2. Main References (Sources)	Books, courses, software, and websites
A. Recommended books and references (scientific journals, reports, etc.)	Recent scientific research and journals in the field of specialization
B. Electronic references, Internet sites	Websites of universities, institutes, and specialized research centers, engineering and technical websites

12. Curriculum Development Plan
Researching the latest scientific developments in this topic, collecting scientific material, and finding sufficient sources on the developments that have occurred in order to add them to the prescribed curriculum in a way that serves its development.

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	English Language- **Eng/2**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	1 * 30 = 30
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General Objective: To qualify the student to be able to: Distinguishing between tenses in English	
Specific Objective: The student will be able to: Speak English easily and can extract verbs according to their tenses.	

9. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1+2	**1**	- Tenses - Questions - Using a bilingual dictionary - Social expressions 1	Getting to know you	Lecture	Oral assessment
3-4	**1**	- Present tenses - have/have got - Collocation – daily life - Making conversation	The way we live	Lecture	Direct questions + Short exams
5+6	**1**	- Past tenses - Word formation - Time expressions	It all went wrong	Lecture	Direct questions + Short exams
7+8	**1**	- much/many - some/any - a few, a little, a lot of - Articles - Shopping - Prices	Let's go shopping!	Lecture	Direct questions + Short exams
9+10	**1**	- Verb patterns 1 - Future forms - Hot verbs - How do you feel?	What do you want to do?	Lecture	Direct question + Short exam
11+12	**1**	- What…like? - Comparative & superlatives - Synonyms & antonyms - Directions	Tell me! What's it like?	Lecture	Direct questions + Short exams
13+14	**1**	- Present perfect - for, since - Adverbs, word pairs - Short answers	Famous couples	Lecture	Direct questions + Short exams
15+16	**1**	- have (got) to - should/must - Words that go together - At the doctor's	Do & Don't	Lecture	Direct questions + Short exams
17+18	**1**	- Time clauses - if - Hot verbs - In a hotel	Going places	Lecture	Direct questions + Short exams

19+20	**1**	- Verb patterns 2 - manage to, used to - -ed/-ing adjectives - Exclamations	Scared to death	Lecture	Direct questions + Short exams
21+22	**1**	- Passive - Verbs & nouns that go together - Notices	Things that changed the world	Lecture	Direct questions + Short exams
23+24	**1**	- Second conditional - might - Phrasal verbs - Social expressions 2	Dreams and reality	Lecture	Direct questions + Short exams
25+26	**1**	- Present perfect continuous - Word formation - Adverbs - Telephoning	Earning a living	Lecture	Direct questions + Short exams
27+28	**1**	- Past perfect - Reported statements - Saying goodbye	Love you and leave you	Lecture	Direct questions + Short exams

10. Infrastructure	
1. Required textbooks	New Headway English Course Pre-Intermediate Student's Book
2. Main References (Sources)	Soars, J., Soars, L. (2006). New Headway Plus: Pre-Intermediate. United Kingdom: Oxford University Press
A. Recommended books and references (scientific journals, reports, etc.)	Audio CDs or Online Audio: Recording of listening exercises. Dialogues, and pronunciation practice
B. Electronic references, Internet sites	New Headway Online: www.oup.com/elt/headway

11. Curriculum Development Plan
Searching for the latest developments in the curriculum to keep pace with modern linguistic developments.

Course Description Form

Course Description

This course description provides a concise summary of the main features of the course and the learning outcomes expected of the student, demonstrating whether he has made the most of the learning opportunities available and must be linked to the program description.

1. Educational Institution	Al-Furat Al-Awsat Technical University Al-Mussaib Technical Institute
2. Scientific department /Center	Medical Instruments Techniques
3. Course Name/Code	Baath Party Crimes- **Bath**
4. Available forms of attendance	Class
5. Semester/Year	Second Year
6. Number of academic hours (total)	1 * 30 = 30
7. Date of preparation of this description	27-2-2025
8. Course objectives	
General Objective: To qualify the student to be able to: Learn about local and international laws that deal with human rights issues.	
Specific Objective: The student will be able to: To be able to identify the types of crimes committed within the country and distinguish between them and crimes against humanity.	

9. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject name**	**Learning method**	**Evaluation method**
1+2	**1**	The concept and definition of crimes and their types	Definition of crimes	Lecture	Oral assessment
3-4	**1**	The position of the Supreme Iraqi Criminal Tribunal Law of 2005	The most important decisions issued by the Supreme Criminal Tribunal	Lecture	Oral assessment
5+6	**1**	Types of International Crimes	Types of International Crimes	Lecture	Oral assessment
7+8	**1**	The role of the Baath regime in psychological violations and their consequences	The role of the Baath regime	Lecture	Oral assessment
9+10	**1**	The role of the Baath regime in psychological violations and their consequences	The Violative Role of the Baath Party.	Lecture	Oral assessment
11+12	**1**	The Baath regime's position on religion and religious institutions	System position	Lecture	Oral assessment
13+14	**1**	The role of the Baath regime in violating human rights laws	The role of the Baath regime	Lecture	Oral assessment
15+16	**1**	Political and military violations of the Baath regime	Violations	Lecture	Monthly exam
17+18	**1**	Baath regime environmental violations	Baath regime environmental violations	Lecture	Oral assessment
19+20	**1**	Iraq /War Pollution	War Pollution	Lecture	Oral assessment

21+22	**1**	Baath regime environmental violations in Iraq destroying cities.	Destruction of cities	Lecture	Oral assessment
23+24	**1**	Draining of the Marshes	Baath regime violations	Lecture	Daily exam
25+26	**1**	Legal and legal adaptation of the crime of mass graves	Legal conditioning	Lecture	Oral assessment
27+28	**1**	The role of the regime in the mass graves in Iraq	Mass graves	Lecture	Monthly exam

10. Infrastructure	
1. Required textbooks	Methodical book
2. Main References (Sources)	Websites
A. Recommended books and references (scientific journals, reports, etc.)	Recent scientific research and journals in the field of specialization.
B. Electronic references, Internet sites	Websites of universities, institutes, and specialized research centers.

11. Curriculum Development Plan
Search for the latest scientific developments on this topic.