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

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 second 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), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

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:

<u>Academic Program Description</u>: 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.

<u>Course Description</u>: 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.

<u>Program Vision</u>: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

<u>Program Mission</u>: 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.

<u>Curriculum Structure</u>: 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 extracurricular activities to achieve the learning outcomes of the program. Ministry of Higher Education and Scientific Research Scientific Supervision and Scientific Evaluation Apparatus Directorate of Quality Assurance and Academic Accreditation Accreditation Department



Academic program description form for colleges and institutes

2024/2023

University: Al-Furat Al-Awsat Technical University College/Institute: Technical Institute/Kufa Scientific Department: Electrical Technologies Date of filling the file: 1/5/2024

Signature: Name of department head: Asst.Prof. Hashim Dhahir Mohammed Date: 5/7/2024

Signature: Name of scientific assistant: Asst.Prof. Nadia Abd AL Hadi Alneame Date: 5/7/2024

The description form has been checked by Division of Quality Assurance and University Performance Name of the manager of the Quality Assurance and University Performance Division: Kulood Medefer Abd Ali

Date: 5/7/2024 Signature

Approval of the Dean Prof. Dr. Fadhil Sami Zeger

1. Program Vision

The Department of Electrical Technologies should be better and in continuous progress so that we can graduate skilled and professional technicians in their field of work.

2. Program Mission

Graduating technicians with good competencies in the field of advanced electrical technologies after completing the application so that they are able to teach in higher institutes and manage scientific laboratories in electrical power distribution stations.

3. **Program Objectives**

The department aims to graduate technical personnel qualified to carry out the work of operating and maintaining electrical units in stations for generating, transmitting and distributing electrical energy and maintaining the prevention and control devices in the electrical energy system.

4. Program Accreditation

Engineering specializations ABET

5. Other external influences

There is a close relationship with the job market that needs our graduates

6. Program Structur	e			
Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution				
Requirements				
College				
Requirements				
Department Requirements	18	12 ^v	50%	Basic
Summer Training	١	4	50%	Basic
Other				

* This can include notes whether the course is basic or optional.

7. Program Des	cription			
Year/Level	Course Code	Course Name	Credi	t Hours
			theoretical	practical
The first stage	RELEC1001	Electrical circuits and	2	2
		measurements		
The first stage	RELEC1002	Electrical installations	2	2
The first stage	RELEC1003	electronics	2	2
The first stage	RELEC1004	Labs	-	6
The first stage	RELEC1005	mathematics	2	-
The first stage	RELEC1006	computer applications	1	2
The first stage	RELEC1007	Engineering and	-	3
The mst stage		electrical drawing		
The first stage	RELEC1008	Human rights and	2	-
The mist stage		democracy		
The first stage	RELEC1009	Occupational safety	2	-
The first stage	RELEC10010	Digital electronics	1	2
The first stage	RELEC10011	English Language	2	-
The second stage	RELEC2001	Electrical machines	2	3
The second stage	RELEC2002	electrical networks	2	3
The second stage	RELEC2003	power electronics	2	3
The second stage	RELEC2004	Maintenance laboratories	-	4
		workshop		
The second stage	RELEC2006	computer applications	1	2
The second stage	RELEC2007	The project	-	2
The second stage	RELEC2008	electrical drawing	-	3
The second stage	RELEC2009	Programmable logic	1	2
		control (PLC)		
The second stage	RELEC20010	English language	2	-

8. Expected learning out	8. Expected learning outcomes of the program							
Knowledge								
1- The ability to establish	1- The student must be familiar with the basics of the required							
electricity and maintain	technology.							
electrical appliances.	2- That the student understands the required scientific and							
2- The ability to draw	technical details.							
electrical maps using	3- The student should analyze and solve practical problems.							
AutoCAD.								
3- The ability to carry out								
electrical maintenance work.								
4- Teaching leadership skills,								
the value and quality of								
commitment, ethical								
behavior and respect for								
others.								
Skills								
1- Be able to install and	1- Good knowledge of the principles of electrical technologies							
operate electrical machines.	associated with them.							

2- Be able to conduct laboratory experiments	2- Technical ability in his field of work.
3- The ability to maintain	
laboratory equipment.	
4- Implementing sections of	
electrical works projects.	
5- Calculating the amounts of	
electricity disbursed	
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
1- The ability to work within	1- Commitment to the ethics of the educational institution.
a team	2- Receiving information and cognitive acceptance
2- The ability to	
communicate effectively.	
3- The ability to adapt to	
similar specializations	
(communications -	
computers - electronics)	
4- Effective influence on	
society and the labor market	
through training and	
development programs	
related to specialization and	
at various levels.	
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Lectures, laboratories, workshops, summer training, projects.

10. Evaluation methods

1- Exams.

- 2- Writing and submitting reports.
- 3- Scientific discussions.
- 4- For attendance and daily activities.

		11. Faculty Faculty Members			
Academic Rank	Spe	Requirements /Skills (if applicable)	Number of the teaching staff		
	General	Special		Staff	Lecturer
Hashem Dahir Muhammad	Electrical engineering	Electrical power engineering		✓	
Seham Abdul Hussein Massan	Communications Engineering	Digital systems and computer electronics		\checkmark	
Ali Abdel Yasir Kadhim	Electrical engineering	Electrical power engineering		✓	
Monther Muhammad	General electricity	The control		~	
Ammar Jaber Kadhim	Physics	Nanotechnology		~	
Nizar Abadi Habib	Computer Engineering	Computer Engineering		\checkmark	
Nasser Muhammed Hussain	Communications Engineering	Communications Engineering		\checkmark	
Sameer Moein Mohamed	General Electrical	Electrical installations		~	
Alaa Jasim Kadhim Mohammed	Technical engineering	Computer communication networks		~	
Nabil Hilal Taleb	General Electrical	General Electrical		√	
Salah Youssef Harb	General Electrical	General Electrical		✓	
Fadhila Jaber Badan	General Electrical	Network Electric		✓	
Khansa Abdul- Reza Sughair	General Electrical	Network Electric		\checkmark	

Zainab Hadi Muhammad	Accounting	Accounting		~	
Kabila Abd ALZahra Murza	General Electrical	Network Electric		~	
Mona Abd AL Amir Mahmoud	General Electrical	General Electrical		~	
Russell Salim Abd ALShaheed	Electrical engineering	General Electrical		~	
Mustafa Rahman Abd Alabbas	General electricity	Electrical Power		~	
Zahraa Ahmed Ghani	Electronic and Communication Engineering	Electronic and Communication Engineering			~
Hayder khenyab hashim	Electrical engeneering	communications system			\checkmark
Asmaa jasim kadhum	Mechatronics	Mechatronics			~

Professional Development

Mentoring new faculty members

Directing new faculty members to the necessity of working on developing the scientific method, methods of delivering scientific lectures, and how to deliver practical material to the student in the easiest interactive ways.

Professional development of faculty members

Working to develop realistic, practical ideas, working to develop scientific laboratories, and paying more attention to the practical side, as the students' specialization is a technical specialization.

12. Acceptance Criterion

- Students graduating from professional preparatory schools in the corresponding specialization (electronics - general electricity - computer - refrigeration and air conditioning) are accepted from the program, as the student who graduated from the corresponding specialization is accepted into the program in the first stage.

- Must be a graduate of the same academic year.

- He must not be an employee.

- Distinguished Employees Channel.

1- The student must not be more than forty years old.

2- He has actual service for the two years preceding the year of admission.

3- His registration must not be regulated and he must not have been accepted by other admission channels.

4- An employee accepted into technical institutes must have an average of not less than (60%) in preparatory studies in its branches (scientific, vocational).

13. The most important sources of information about the program

- 1- Books prescribed by the Ministry of Higher Education and Scientific Research
- 2- Accredited external scientific sources
- 3- Use of libraries and the Internet

14. Program Development Plan

The department has a well-thought-out methodology in order to develop the department and achieve the goals of the university and the institute, as the department presidency, the department council, and the scientific committee work to provide all the requirements for developing the department.

			P	rogran	n Skills	Outlin	ne								
							Rec	quired	progr	am L	earnin	g outcom	es		
Year/Level	ear/Level Course Code Course Name		Basic or optional	Knowledge				Skills			Ethics				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
	RELEC1001	Electrical circuits and measurement s	Basic	<i>、</i>				1				<i>√</i>			<i>✓</i>
	RELEC1002	Electrical installations	Basic	✓		~		~				✓		✓	√
	RELEC100 ^r	electronics	Basic	\checkmark		✓		✓			\checkmark	\checkmark		\checkmark	\checkmark
	RELEC100 [£]	labs	Basic	\checkmark	√		\checkmark				\checkmark		>	\checkmark	\checkmark
2023/2024	RELEC100°	mathematics	Assist	\checkmark				\checkmark							\checkmark
The first	RELEC1007	computer applications	Assist		√	~			~	√		✓	\checkmark		√
stage	RELEC100 ^V	Engineering and electrical drawing	Basic		<i>√</i>	<i>√</i>			<i>、</i>	<i>✓</i>		\checkmark	>		✓
I	RELEC100 ^A	Human rights and democracy	Assist				1						√		✓
	RELEC1004	Occupational safety	Assist				✓						\checkmark		<i>√</i>
	RELEC100	Digital	Basic	\checkmark	\checkmark				\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	√

		electronics													
	RELEC10011	English Language	Assist	✓	<i>√</i>					√	√	\checkmark	✓	✓	√
	RELEC2001	Electrical machines	Basic	✓				✓	~		√	\checkmark	\checkmark	\checkmark	<i>✓</i>
	RELEC2002	electrical networks	Basic	✓		\checkmark		\checkmark	<i>✓</i>		\checkmark	\checkmark	\checkmark	\checkmark	<i>√</i>
	RELEC2003	power electronics	Basic	~				✓	\checkmark		\checkmark	\checkmark	✓	\checkmark	<i>J</i>
	RELEC2004	Maintenance laboratories workshop	Basic	~			✓	~	<i>✓</i>		√	<i>✓</i>	√	√	<i>J</i>
2023/2024 The second	RELEC2005	Industrial establishment s		~		\checkmark		~	<i>✓</i>		\checkmark	\checkmark	✓	✓	<i>✓</i>
stage	RELEC2006	computer applications 2	Assist		<i>√</i>					>		>	\checkmark	\checkmark	\checkmark
	RELEC2007	The project	Basic	\checkmark	\checkmark	>	\checkmark	\checkmark	>	 		\checkmark	\checkmark	\checkmark	<i>√</i>
	RELEC2008	Electrical drawing	Basic		✓	>				>		>	\checkmark	\checkmark	\checkmark
	RELEC2009	Programmab le logic control (PLC)	Basic	~	\checkmark			\checkmark	<i>✓</i>	<i>✓</i>		\checkmark	\checkmark	<i>✓</i>	<i>✓</i>
	RELEC20010	English Langauge	Assist	✓	√					~	√	\checkmark	✓	~	~

• Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

1. Course Name:									
	Electrical circuits and measurements								
2. Course Code:									
	RELEC1001								
3. Semester / Year:	3. Semester / Year:								
	Annual								
4. Description Prepara	tion Date:								
	5/7/2021								
5. Available Attendan	ce Forms:								
6 Number of Credit U	Incoretical lectures, practical lectures								
	anal hours (60 theoretical hours 60 practical hours)								
7 Course administrate	r's name (mention all if more than one name)								
Name: Asmaa jasin	hadhum								
Email: asmaaiasim	@atu edu iq								
8. Course Objectives									
Course Objectives	1. Introducing the student to the foundations of electrical								
	engineering.								
	2. Introducing the student to the terms used in electrical								
	circuits.								
	3. Introducing the student to how to connect electrical circui								
	components and use devices to measure electrical quantities.								
	4. Introducing the student to the laws and theories used in								
	simplifying and solving direct current and current electrical								
	5 Introducing the student to the components of the electrical								
	system.								
	6. Introducing the student to the principles of parts of								
	electrical circuits, how to deal with each part, and calculate								
	voltage, current, and power Concerning the types of								
	electrical loads (resistive, inductive, or capacitive).								
9. Teaching and Learn	ing Strategies								
Strategy	1. Using modern means to present the theoretical and								
	practical aspects, such as electronic display devices Different								
	ways to attract attention and attract students so that the idea								
	reaches the student better.								
	2. Giving students extracurricular assignments that require								
	the use of skills and self-explanations in experimental ways.								
	3. Interrogating students through discussion sessions by								
	asking intellectual questions (how, why, when, Where, which)								
	101 specific topics.								
	the academic subjects taken in the previous academic lovels								
	and linking them to the new ones								
	5. Providing students with practical skills by conducting								
	or restance statents with practical skins by collutering								

Course Description Form

		practic	cal experiments on laborate	ory equipme	nt.
10. Cours	e Structure			[-
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	The student must be able to understand and solve scientific problems related to the lesson	The system of units used in electricity and units of measurement for each substance (its parts and multiples) Mathematical applications for converting values using units. Defining the basic units of voltage, current and resistance - electrical circuit components - Ohm's law - factors affecting resistance value - specific resistance of conductive and insulating materials.	Lecture	1-Direct evaluation 2-Exams (written + practica l)
Second	2	The student must be able to understand and solve scientific problems related to the lesson	DC circuits include: 1- Connecting resistors in series with examples 2- Connecting resistors in parallel with examples 3- Mixed connection of resistors with examples 4- Star and trigonometric connections (Y / Δ) of resistors and conversion from each to the other, with examples.	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Third	2	The student must be able to understand and solve scientific problems related to	Applications on series, parallel, mixed interconnect, star and triangular circuits	Lecture	1-Direct evaluation . 2-Exams (written + practical)
		the lesson			

		student must be able to understand and solve scientific problems related to	DefinitionofKirchhoff's Laws forCurrent and VoltagewithQuestionsAnsweredb.Maxwell solutionwith examples		evaluation . 2-Exams (written + practical)
Fifth	2	related to the lesson The student must be able to understand and solve scientific problems related to the lesson	1.Thevenin's Theorem - Definition of Theory - How to apply it in DC circuits2.Norton's theory - definition of the theory - how to apply it in DC circuits	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Sixth	2	The student must be able to understand and solve scientific problems related to the lesson	Applications to Thevenin and Norton Theorem	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Seventh	2	The student must be able to understand and solve scientific problems related to the lesson	Matching theory - definition of the theory - steps to apply it in solving direct current circuits that contain more than one source - solving examples Definition of current source and voltage source (continuous power distributor) and how to convert from one to the other - The theory of transferring the greatest possible power - Definition of the theory and derivation of its relations - Application	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Eighth	2	The student	Alternating quantities, including - their	Lecture	1-Direct evaluation

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		mustbeabletounderstandandsolvescientificproblemsrelatedto	definition,thecharacteristicsofalternatingcurrenthowtogeneratealternatingcurrent, itswaveformanditsrelationsthe definition		. 2-Exams (written + practical)
		the lesson	of the effective value (RMS) and the average value and their relations to find the formation factor and the value factor for irregular waveforms with applied examples		
Ninth	2	The student must be able to understand and solve scientific problems related to the lesson	Alternating vector quantities - their definition - phase and directional representation of them - phase angle and how to find them - finding the resultant of vector quantities including multiplication, division, addition and subtraction - with applied examples	Lecture	1-Direct evaluation . 2-Exams (written + practical)
The tenth	2	The student must be able to understand and solve scientific problems related to the lesson	Study the effect of alternating current on a circuit that contains only resistance, a circuit that contains only pure inductance - a circuit that contains only pure capacitance - find a phase angle between voltage and current for each circuit with an example solution	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Eleventh	2	The student must be able to understand and solve scientific problems related to the lesson	The effect of alternating current on a circuit containing resistance and inductance, respectively -A circuit containing a resistance and a capacitor in series -A circuit that contains resistance, inductance, and capacitance in series -Finding the	Lecture	1-Direct evaluation . 2-Exams (written + practical)

			relationship between current and voltage in the three cases-Phase angle-The total impedance of the circuit with applied examples.		
Twelveth	2	The student must be able to understand and solve scientific problems related to the lesson	The effect of alternating current on a circuit containing resistance and inductance in parallel -A circuit containing a resistor and a capacitor in parallel -A circuit containing resistance, inductance, and capacitance in parallel - Finding the relationship between current and voltage in the three cases -Phase angle - definition and how to find it- Find the impedance — Permittivity with .application examples	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Thirteenth	2	The student must be able to understand and solve scientific problems related to the lesson	1-7 (J- Use profile Operator) or the composite operator to find the total impedance, total permittivity, current, voltage and phase angle for circuits connecting impedances in series and in parallel with a solution of examples	Lecture	1-Direct evaluation . 2-Exams (written + practical)
fourteenth	2	The student must be able to understand and solve scientific problems related to the lesson	Resonance circuits, including – series resonance circuit – defining the state of resonance and how to access it – calculating the current, voltage, impedance and frequency angle at resonance – finding the width of the beam – finding the quality factor – and drawing the relationship	Lecture	1-Direct evaluation . 2-Exams (written + practical)

Fifteenth	2	The student must be able to understand and solve scientific problems related to the lesson	betweeninductivereactanceandcapacitivereactancewithfrequencysolving examplesParallelresonancecircuit - itsdefinition -calculatethecurrent,voltage,impedanceangle, phaseangleandresonantfrequency -find the beam - anddrawgraphicrelationswiththefindthequalityfactor -solveexamples	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Sixteen	2	The student must be able to understand and solve scientific problems related to the lesson	Application of theories such as Norton's theory and Theven's theory and congruence on alternating current circuits, with examples	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Seventeenth	2	The student must be able to understand and solve scientific problems related to the lesson	Power in alternating current circuits, including power calculation in circuits containing resistance only, circuits containing inductance only, circuits containing capacitance only, circuit containing resistance, inductance, and capacitance in series and parallel, definition of active power and how to calculate it, passive power, and how to	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Eighteen	2	The student must be able to understand and solve	Total apparent power (its definition) - How to draw the power triangle - Power factor - Its definition and impact on alternating current	Lecture	1-Direct evaluation . 2-Exams (written + practical)

Ninotoonth		scientific problems related to the lesson	circuits - How to improve the power factor - With applied examples	Locture	1 Direct
meteentn	2	student must be able to understand and solve scientific problems related to the lesson	transferring the greatest possible power in alternating current circuits - the derivation of its relations - with applied examples	Lecture	i-Direct evaluation . 2-Exams (written + practical)
Twentieth	2	The student must be able to understand and solve scientific problems related to the lesson	Practical methods for measuring resistors with high, medium and small values - using an ohmmeter in series and parallel - the ammeter and voltmeter method - the compensation method - using the Wheatstone bridge - the voltage divider method - the switching method - with solving examples for each method	Lecture	1-Direct evaluation . 2-Exams (written + practical)
ſwenty first	2	The student must be able to understand and solve scientific problems related to the lesson	Alternating current circuits with three phases - its definition and how to generate alternating current one phase - two phases - three phases - with drawing each circuit of the star and triangle connections in alternating current circuits with three phases and the special relations for calculating current, line voltages, phase, total capacity - phase capacity – Characteristics of each link when used in balanced loads, with an example solution	Lecture	1-Direct evaluation . 2-Exams (written + practical)

Twenty tow	2	The student must be able to understand and solve scientific problems related to the lesson	Solvepracticalexamplesaboutalternating current with(threephases)triangularandstarstarconnectionswithbalancedandunbalanced loads	Lecture	1-Direct evaluation . 2-Exams (written + practical)
'wenty third	2	The student must be able to understand and solve scientific problems related to the lesson	Methods of measuring power for loads with three phases - the wattmeter device, how to connect it to the circuit to measure the active power - and calculate the inactive power and the apparent power with an example solution Measuring power using a wattmeter and voltage - how to find the total power in this way and in the case of star and triangular connections - using two wattmeters - using three wattmeters	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Twenty fourth	2	The student must be able to understand and solve scientific problems related to the lesson	Magnetism - magnetic circle - introduction to magnetism, north and south poles - types of magnetic materials - basic characteristics of magnetic materials and their definition, include magnetic field - magnetic flux - magnetic flux - magnetic flux density and factors affecting magnetic flux - permeability and its impact - magnetic circuits and the application of Kirchhoff's laws on it.	Lecture	1-Direct evaluation . 2-Exams (written + practical)
Wenty fifth	2	The student must be	Solve practical examples on magnetism	Lecture	1-Direct evaluation . 2-Exams

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		able to			(written +
		understand			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
wenty sixth	2	The	The coil's self-	Lecture	1-Direct
·		student	inductance		evaluation
		must be	(electromagnetic		2-Exams
		able to	induction) - its		(written +
		understand	definition - the special		nractical)
		and solvo	relationships to find the		practical)
		anu solve	coil's colf inductors		
		scientific	the mutual induction		
		problems	the mutual induction		
		related to	between two colls - and		
		the lesson	the relationships to find		
			the mutual induction		
			according to the type of		
			connection of the two		
			coils, including:		
			Connect Series, Mutual		
			and opposite		
Twenty	2	The	Curves of growth and	Lecture	1-Direct
seventh		student	decay of the current in		evaluation
		must be	the inductive circuit -		. 2-Exams
		able to	explanation of this		(written +
		understand	circuit and its effect on		nractical)
		and solve	direct current - the		pructicut)
		scientific	general relationship of		
		nrohloms	growth and decay of the		
		problems	growth and decay of the		
		the leasen	duction of the comment		
		the lesson	drawing the current		
			and calculating the time		
			constant - solving		
			examples		
			Charging and		
			discharging capacitors,		
			including the use of		
			capacitors in DC		
			circuits, the general		
			relationship for		
			charging and		
			discharging capacitors.		
			the current figure - the		
			effect of the time		
			constant with its		
			colculation - avamples		
			calculation - examples		
Twonty	2	The	Solution Moosuring devices	Looturo	1 Direct
I wenty	L	atudant	including terms	Lecture	1-Direct
eighth		student	including - types of		evaluation

		must be	measuring device	es - the		. 2-Exams
		able to	nature of their	work -		(written +
		understand	measuring device	es with		practical)
		and solve	a moving coil	- its		-
		scientific	installation and	use in		
		problems	measuring volta	age and		
		related to	current.	with		
		the lesson	mentioning	its		
			advantages	and		
			disadvantages	and		
			drawing th	e device		
Twenty	2	The	The measuring	device	Locturo	1-Direct
ninth		student	with an iron co	re - its	Lecture	evaluation
IIIIttii		must bo	composition and	how to		2 Exome
		must be	composition and			· 2-Exams
		able to	ita advantaga	ement -		(written +
		understand	its advantage	s and		practical)
		and solve	disadvantages	and		
		scientific	drawing a diag	gram of		
		problems	th	e device		
		related to				
		the lesson	XX 7.44	•	T	1 D'
Thirty	2	The	Wattmeter me	asuring	Lecture	1-Direct
		student	devices - its com	position		evaluation
		must be	- device diagra	m - its		. 2-Exams
		able to	arrangement	in the		(written +
		understand	electric circu	it to		practical)
		and solve	measure pov	ver -		
		scientific	moment equation	ons - its		
		problems	advantages	-		
		related to	disadvantages	- the		
		the lesson	oscilloscope de	evice -		
			device drawing	g - its		
			structure - h	now to		
			operate a	nd use it		
11. Course	e Evaluatio	n				
Distributing	the score	out of 100 acc	cording to the task	s assigne	d to the stude	ent such as daily
preparation,	daily oral,	monthly, or wr	ritten exams, report	s etc		
12. Learni	ng and Tea	ching Resource	es			
Required te	xtbooks (cu	urricular books,	if any)	1- Introc	luctory Circui	t Analysis
	,	,	-	(Tenth E	Edition) By B	OYLESTED
				2-Funda	mentals of El	ectric Circuits
				(Tenth F	Edition) By Cl	narles K.
				Alexand	er and Matthe	ew N. O.
				Sadiku		· · · · · · · ·
Main refere	nces (sourc	es)		~		
Recommend	led book	s and refere	ences (scientific			
iournals rer	orts		Jorentine (Serentine			
Flectronic F	References	Websites				
	SUPPORTUDED.					

1. Cou	irse Name:					
2 0	0.1		Electrical installations			
2. Course Code:						
3 Sen	nester / Vea	r	KELEC1002			
<i>J.</i> 501		1.	Annual			
4. Des	cription Pre	eparation Date:				
	I I I	I	5/7/2021			
5. Ava	ailable Atter	ndance Forms:				
		Theore	tical lectures, practical	lectures		
6. Nur	nber of Cre	dit Hours (Tota	l) / Number of Units (Tot	al)		
_ ~	120) annual hours	(60 theoretical hours, 6	0 practical ho	urs)	
<u>7. Cou</u>	arse adminis	strator's name (r	nention all, if more than o	one name)		
Nar E	ne: Ali Abc	lel Yasır Kadh	ım			
Em	all: kin.all	watu.edu.iq				
8. Cor	urse Obiecti	ves				
Course Oh	iectives	To int	roduce the student to th	e various elec	trical installation	
	U	system	S.			
		The st	udent will be able to id	lentify electric	cal materials and	
		wiring	systems used in labora	tories and hon	nes, establish and	
		install	electrical machines, an	nd methods of	f controlling and	
0 Taa	ahing and I	protect	ting various loads durin	g the establish	iment.	
9. Ita Stratogy	ching and I		ng modern means to	nresent the	theoretical and	
Strategy		practic	al aspects, such as elect	tronic display	devices Different	
		ways t	o attract attention and a	attract student	ts so that the idea	
		reache	s the student better.			
		2. Givi	ing students extracurri	cular assignm	ents that require	
		the use	e of skills and self-explai	nations in expe	erimental ways.	
		3. Into	errogating students th	rough discus	sion sessions by	
		asking for spe	intellectual questions (I	iow, wny, wne	en, where, which)	
			ng brainstorming and	feedback met	hods in order to	
		activat	the accumulated exp	eriences of stu	idents By linking	
		the aca	ademic subjects taken i	n the previou	s academic levels	
		and lin	king them to the new or	nes.		
		5. Pro	viding students with	practical skill	s by conducting	
10 0	~	practio	cal			
10. Cours	e Structure	Decurit		Teenstere	Evolution	
week	Hours	Kequired Loorning	Unit or subject name	Learning	Evaluation	
		Outcomes		methoa	methou	
First	2	The	An overview of the	Lecture	1-Direct	
- 11.50		student	subject's curriculum	Lecture	evaluation.	
		must be	vocabulary and		2-Exams	
		able to	scientific sources		(written	
		understand	from methodological		+	
		and solve	and auxiliary books		practical)	

		scientific problems related to the lesson	 Classification of materials into: Conductor electrical materials Semiconductors Insulators 		
Second	2	The student must be able to understand and solve scientific problems related to the lesson	Principles of electricity - Potential difference, current intensity, electric current intensity (amps), factors affecting the intensity of the electric current, resistance, factors affecting resistance. - Electrical circuit components source, types of electrical sockets, wires and their types, electrical loads of all kinds - Switches, their types, protective equipment, junction boxes Electric lamps, their types and uses	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Third	2	The student must be able to understand and solve scientific problems related to the lesson	Electrical conductive materials. - Copper Cupper - Electrical properties of copper - Mechanical properties of copper - Aluminum - Electrical properties of aluminum - Mechanical properties of aluminum - Their advantages and uses in the field of electricity High-resistance alloys – properties that make them good	Lecture	1-Direct evaluation. 2-Exams (written + practical)
			electrical uses	T4	1 Dime of

		student must be able to understand and solve scientific problems related to the lesson	Examples of insulating materials - air, oil, their properties and uses - Properties of insulating materials in relation to their tolerance to temperature - Solid insulating materials (cotton, paper, asbestos, glass fabric, industrial tissues and films, mica, other materials).		evaluation. 2-Exams (written + practical)
E GU			permittivity (dielectric constant), laws and solved examples	•	1.0.
r iith	2	student must be able to understand and solve scientific problems related to the lesson	 Magnetic properties of materials Magnetic force, types of magnetic materials, associated terms - magnetic properties - laws related to magnetism Solved examples 	Lecture	i-Direct evaluation. 2-Exams (written + practical)
Sixth	2	The student must be able to understand and solve scientific problems related to the lesson	Magnetic circuits - Applying Kirchhoff's laws to it. Solved examples of magnetism-	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Seventh	2	The student must be able to understand and solve scientific problems related to	Mechanical properties of electrical materials - Tensile, stress, elongation, elasticity, others - Solved examples	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Eighth	2	The	The stages that	Lecture	1-Direct

Ninth	2	student must be able to understand and solve scientific problems related to the lesson	electrical energy passes through - Electrical power generation (a brief overview of the types of generating stations) - Electrical energy transmission (systems used, advantages and disadvantages) - Raising and lowering secondary stations and their capacities -Distribution of electrical energy (systems used) of various types - Initial principles on	Lecture	evaluation. 2-Exams (written + practical) 1-Direct
		student must be able to understand and solve scientific problems related to the lesson	how to prepare a consumer from a secondary station, the materials needed for that, and the type of consumer - Home and industrial distribution panels (installation and connection) - How to supply a large building with electricity, with an example - Capacity of the electrical transformers used (KVA) and their locations in the electrical network -Diagrams and solved examples		evaluation. 2-Exams (written + practical)
Tenth	2	The student must be able to understand and solve scientific	Types of switches used in electrical installations and their importance - Traditional Toggle Switch (single-pole, two-way, middle.	Lecture	1-Direct evaluation. 2-Exams (written + practical)

		problems related to the lesson	two-pole, three-way) - Push button switch - Other (from recently used) -Draw electrical circuits containing these switches in complete circuits	.	
Eleventh	2	The student must be able to understand and solve scientific problems related to the lesson	Protection devices used in electrical installations (fuses) - Definition of (fuse, rated current, fusing current, fusing coefficient, expected current and cutting current, fusing time, arc duration time, total operating time) - Types of fuses with the advantages and disadvantages of each, how to choose a fuse -Coordination between breakers in the same electrical circuit	Lecture	I-Direct evaluation. 2-Exams (written + practical)
Twelveth	2	The student must be able to understand and solve scientific problems related to the lesson	Circuit Breakers With its composition and working principle (Magnetic Circuit Breakers) - Magnetic Circuit Breakers With its working principle (Magnetic and Thermal Circuit Breakers) - - Miniature Circuit Breakers) - - Miniature Circuit Breaker (MCB) installation and wiring - Earth leakage circuit breaker (ELCB) installation and working theory - How to distribute loads within the building through the used distribution	Lecture	1-Direct evaluation. 2-Exams (written + practical)

			panel and calculate		
			the breaker capacity		
Thirteenth	2	The student must be able to	Electrical Wiring Systems - B.B. non-insulated conductor system,	Lecture	1-Direct evaluation. 2-Exams (written +
		understand and solve scientific problems	T.R.S. strong rubber strapping system - System of conductors insulated		practical)
		related to the lesson	with (P.V.C), system of conductors insulated with		
			(P.C.P),wiringsystem insideplasticpipesandthe		
			necessary equipment for that, numbering of wires and cables at		
			account the colors of the wires when installing		
fourteenth	2	The	Domestic electrical	Lecture	1-Direct
-	-	student	installations		evaluation.
		must be	Types of home		2-Exams
		able to	electrical		(written +
		understand	installations.		practical)
		and solve	advantages and		F
		scientific	disadvantages of		
		problems	each. safety		
		related to	conditions, cost,		
		the lesson	required durability.		
			and the general		
			appearance and		
			shape of the		
			establishment.		
			- Tools used in		
			home construction		
			- Establishing		
			laboratories and workshops and		
			calculating the cost		
Fifteenth	2	The	Grounding	Lecture	1-Direct
		student	- Grounding		evaluation.
		must be	Components (Earth		2-Exams
		able to	resistance, Earth		(written +
		understand	Resistivity,		practical)
		and solve	Grounding		
		scientific	Electrode, Bonding		
		problems	Equipment)		

		related to the lesson	 Different methods to reduce grounding resistance Devices and equipment that must be grounded The Importance of Grounding The difference between a grounded and ungrounded system, grounding measurement methods 		
Sixteen	2	The student must be able to understand and solve scientific problems related to the lesson	Lightning Rod Lighting Rod - Lightning, the importance of the lightning rod, components of the lightning rod - Important matters when designing a lightning rod -Equipment and structures that must be protected from lightning strikes	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Seventeenth	2	The student must be able to understand and solve scientific problems related to the lesson	Electric shock - Its definition and causes, the relationship of the amount of voltage and current difference to the shock, the path of the current, the intensity of the current passing through the body, the time of passage of the current, and the causes of electric shock. - General rules for safety from shock and post-shock procedures - Factors on which the effect of electric current in the body	Lecture	1-Direct evaluation. 2-Exams (written + practical)

			depends -Preventive measures that can be taken to protect against electrical hazards	Test	1 D
Eignteen	2	student must be able to understand and solve scientific problems related to the lesson	Protection against ground leakage current Earth leakage current circuit breaker - Earth leakage voltage circuit breaker -Places of installation of shock leakage protection breakers (EICB): Determine the breaker capacity according to the load	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Nineteenth	2	The student must be able to understand and solve scientific problems related to the lesson	Single and three phase kwh meter - The theory of work, connection (wiring), installation, how to read, and install the meter - Means of adjusting the counter in case of errors (speed - creep - light load) -The smart meter - its components and how to connect and read it	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twentieth	2	The student must be able to understand and solve scientific problems related to the lesson	Inspection and testing of domestic and industrial electrical installations - Probe checking for polarity, insulation resistance test, toroidal circuit continuity test - How to find faults in cables feeding electrical installations (cuts - seams - all types) -Determine the	Lecture	1-Direct evaluation. 2-Exams (written + practical)

			location of the ground fault in conductors using the Murray loop		
Twenty first	2	The student must be able to understand and solve scientific problems related to the lesson	Alarm and warning circuits - circuit components (bells), push-button switches - heat, flame and smoke detectors, indicators, power source, connectors and connectors and their specifications.	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty tow	2	The student must be able to understand and solve scientific problems related to the lesson	Alarms and protection devices (open - closed) against fire and theft - Internal and external surveillance systems (cameras), fire alarm and detection systems - Laser lighting applications • Optical fiber lighting • Sound lighting systems	Lecture	1-Direct evaluation. 2-Exams (written + practical)
ſwenty third	2	The student must be able to understand and solve scientific problems related to the lesson	 The calling system used in hotels, restaurants and hospitals Internal communication system Signal system in departments and hospitals 	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty fourth	2	The student must be able to understand and solve scientific problems related to the lesson	DC Motors - Structure - Theory of Action - Classification - DC motor applications -How to do wiring and solved mathematical examples	Lecture	1-Direct evaluation. 2-Exams (written + practical)

Fwenty fifth	2	Thestudentmustableto	AC Motors - Single phase motor (construction - work theory - types) Single	Lecture	1-Direct evaluation. 2-Exams (written +
		understand and solve scientific problems related to the lesson	phase induction motor - Three phase motor (construction - work theory - types) Three phase induction motor		practical)
「wenty sixth	2	The student must be able to understand and solve scientific problems related to the lesson	Power circuits and control circuits - Switches used in control circuits - push button switches - rotary switches (ON-OFF) (Rev-ON- OFF) star delta rotary switch (□-Y) -A power circuit and a control circuit to operate a single- phase motor and a three-phase motor	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty seventh	2	The student must be able to understand and solve scientific problems related to the lesson	 -Contactor installation - working theory - operating voltage - circuits to control the operation of the contactor, types of collectors -The information written on the pickup is coil voltage, electrode voltage, electrode current or power, and operating time Explaining the circuit of turning a device on and off (ON-OFF) using a single push button 	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty eighth	2	The student must be	- Thermal relay against surges (installation -	Lecture	1-Direct evaluation. 2-Exams

·		1				
		able to	working theory -	-	(written +	
		understand	adjusting the cu	rrent	practical)	
		and solve	rating - uses)			
		scientific	-Inverse – Time	Over		
		problems	current Relaving	3		
		related to	nrotection			
		the lesson	protection			
			-Solution exa	mple		
Twenty	2	The	TIMER	Lecture	1-Direct	
ninth		student	- Its types		evaluation.	
		must be	(mechanical -		2-Exams	
		able to	electronic -		(written +	
		understand	programmed) - v	work	practical)	
		and solve	theory - timekee	ping		
		scientific	- low-voltage rel	ays		
		problems	- Types of time			
		related to	supervisor in ter	rms		
		the lesson	of job			
			- Types of time	e e		
			tracking in term	S OI		
			Installation			
			- Its application	ns in lation		
			electrical install	remits		
Thirty	2	The	Testing and		1-Direct	
Imity		student	inspection of	Lecture	evaluation.	
		must be	installation		2-Exams	
		able to	- Testing devices	;	(written +	
		understand	Ohmmeter		practical)	
		and solve	(resistance meter	r),		
		scientific	buzzer system of	r		
		problems	battery lamps,			
		related to	micrometer, gro	und		
		the lesson	tester			
			- Types of testing	g		
			Polarity test, gr	ound		
			system quality	test,		
			wire insul	ation		
			resistance test,	back		
11 Cours	Evoluet -	n	circuit continuit	y test		
Diotributin	the sector	II out of 100 con	pording to the test	a aggiograph to the st	tudant qual as dail-	
preparation	daily oral	monthly or w	ritten exame report	is assigned to the si	udent such as dany	
12 Learni	ng and Tee	ching Resource	nuen exams, report	てに		
Required to	ng anu Tea	urricular books	if any)	أسدسات المكائن	الكترب المقررة المطاورة الز	
required te	ALUOUKS (CL	unicular DOOKS,	II ally)	الليسات المحال	الكتب المعررة المصوب الـ	
				طفر الور التعمد. الاکاظم	اندی راه ی داه د، حدار عد	
Main refere	Main references (sources)			توري باوي داود، جبار عبيد عصم. 1- Electrical installation and		
	Wall Telefences (sources)			workshon technology Vol I II III		
				(hv E G Thompson)	n)	

	2- Electrical installation technology (by Michael Neidle).
Recommended books and references (scientific journals, reports)	 Practice on low voltage switch gears (by Siemense Publications). ABB Publications
Electronic References, Websites	موقع المعهد النقني/ الرميث, AI مواقع تجارية عالمية مثل شركة Siemense

1 Cour	a Nama						
I. Cour	se manie:		Flectronics				
2 Cour	se Code:		Electronics				
2. 000			RELEC1003				
3. Seme	ester / Year						
			Annual				
4. Desc	ription Prep	paration Date:					
	-11						
5. Avai	lable Atten	dance Forms:					
		Theoret	ical lectures, practical l	ectures			
6. Num	ber of Cred	it Hours (Total) / Number of Units (Tota	al)			
	120	annual hours	(60 theoretical hours, 60) practical hou	ırs)		
7. Cour	se administ	rator's name (n	nention all, if more than o	ne name)			
Name	e: Ammar	Jaber Kadhim	1				
Emai	l: Ammar.	kadhim.iku@at	u.edu.iq				
8. Cour	se Objectiv	es The state	- J				
Course Obj	ectives	I he st	udent will be able to be	come familiar	with: electronic		
		Condu	etors of all types cor	nnosition nr	eu producis		
		electro	Conductors of all types, composition, properties, uses in electronic circuits and applications - analysis of their				
		electronic circuits with optoelectronic components and their					
		applica	ations.	P			
9. Teacl	hing and Le	arning Strategi	es				
Strategy		1. Le	ctures in modern a	and traditior	nal methods +		
		labora	laboratories, weekly reports on each experiment carried out				
		+ field	visits + summer trainin	g.			
		2. Lib	rary activities and co	nnection to t	he international		
		inform	ation network (the I	nternet) to o	btain additional		
		knowle	edge of academic subjec	ts.			
		3. Pra	5. Fractical laboratories are monitored by the subject teacher and the department's technical staff				
		<i>A</i> Discussion with students' participation that addresses					
		some n	vactical problems	participation	that autresses		
10. Course	Structure	some p	ructicui problems.				
Week	Hours	Required	Unit or subject name	Learning	Evaluation		
		Learning		method	method		
		Outcomes					
First	2	The	Semiconductor	Lecture	1-Direct		
		student	theory - atomic		evaluation.		
		must be	structure - energy		2-Exams		
		able to	levels - crystals -		(written		
		understand	conduction in		+		
		and solve	crystals - gap				
		nrohlems	gans move)		
		related to	gaps move				
		the lesson					
	I		l	l			

Second	2	The student must be able to understand and solve scientific problems related to the lesson	Vaccination - positive (P) crystal, negative (N) crystal, electron current and gap current - total resistance	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Third & Fourth	2	The student must be able to understand and solve scientific problems related to the lesson	Semiconductor diodes - PN junction formation - barrier voltage - energy hill - thermal effects - biased diode - forward bias - reverse bias - characteristic curves in the forward and reverse directions - ephemeral crossing current - minority carrier current - surface leakage current - voltage Breakdown — Breakdown Voltage (PIV) Maximum Forward Current — Maximum Reverse Voltage – (PIVmax) – Diode Equivalent Circuit	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Fifth	2	The student must be able to understand and solve scientific problems related to the lesson	Diode as a current combiner - a half- wave combiner - the continuous value of the current and its calculation - the effective value of the output frequency	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Sixth	2	The student must be able to understand and solve scientific	Full-wave unification - using the center- branch transformer - bridge combiner - calculating the continuous and effective values of	Lecture	1-Direct evaluation. 2-Exams (written + practical)
		problems related to the lesson	the current - extracting the output frequency - comparison between the half-wave combiner and the full-wave combiner - comparison between the full-wave combiners		
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Seventh	2	The student must be able to understand and solve scientific problems related to the lesson	Filters – Capacitance Filtering – (LC) Filter (RC) Filter – Constant Ripple Output Voltage	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Eighth	2	The student must be able to understand and solve scientific problems related to the lesson	Ripplefactor,voltagemultiplier,trimmingcircuitspositivetrimmingnegativetrimmingcompoundtrimming	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Ninth & Tenth	2	The student must be able to understand and solve scientific problems related to the lesson	Zener diode - composition - symbols - properties - avalanche refraction, zener refraction - breaking voltage - power tolerance - zener impedance - temperature effects - zener approximation, constant voltage regulation	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Eleventh & Twelveth	2	The student must be able to understand and solve scientific	Bipolar transistor - its structure - its areas - its symbol - biasing voltages - (α dc) - (β dc) the relationship between (α dc) - (β dc) types	Lecture	1-Direct evaluation. 2-Exams (written + practical)

		problems related to	of bias - approximation		
		the lesson	connection formulas in the transistor and the equivalent circuit		
Thirteenth	2	The student must be able to understand and solve scientific problems related to the lesson	$\label{eq:constraint} \begin{array}{c} Transistor\\ characteristic curves\\ - working areas,\\ definition of (I_{CEO})\\ and (I_{CBO}) - current\\ gain curve - \\ relationship between\\ (I_C) and (I_{CEO}) \end{array}$	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Fourteenth	2	The student must be able to understand and solve scientific problems related to the lesson	Transistor bias circuits - base bias - emitter bias	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Fifteenth & Sixteen	2	The student must be able to understand and solve scientific problems related to the lesson	Collector bias - self- bias - feed-back bias - voltage divider bias - applied examples	Lecture	1-Direct evaluation. 2-Exams (written + practical)
seventeenth	2	The student must be able to understand and solve scientific problems related to the lesson	DC equivalent circuit of the transistor – DC load line	Lecture	1-Direct evaluation. 2-Exams (written + practical)
eighteenth	2	The student must be able to understand	Action points - rest point (Q-Point) applied examples	Lecture	1-Direct evaluation. 2-Exams (written + practical)

		and solve scientific problems related to the lesson			
Nineteenth & Twenty & twenty one	2	The student must be able to understand and solve scientific problems related to the lesson	Transistor in small signal amplification - alternating equivalent circuit - ideal approximation - hybrid constants - equivalent circuit using coefficients (h) - voltage gain - current gain - power gain - input and output resistors - small signal amplifiers - base market - emitter market	Lecture	1-Direct evaluation. 2-Exams (written + practical)
twenty one	2	The student must be able to understand and solve scientific problems related to the lesson	The use of a transistor in voltage regulation - a series regulator - a parallel regulator in a constant voltage source circuit	Lecture	1-Direct evaluation. 2-Exams (written + practical)
twenty third & wenty fourth	2	The student must be able to understand and solve scientific problems related to the lesson	Junction field effect transistor (JEFT) - its structure - its symbol - working theory - characteristic curves - exchange conductivity curve - definition of narrowing voltage (VP), (IDSS), (VGSOff) - characteristic curves for (MOSFET) - (D- MOSFET) - (E- MOSFET) - (E-	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty- fifth & twenty-sixth	2	The student must be able to	Bias circuits (FET) – constant current source bias – working point self-	Lecture	1-Direct evaluation. 2-Exams (written +

Twenty- seventh	2	understand and solve scientific problems related to the lesson The student must be able to understand and solve scientific problems	bias – equiv circuit of (FET of (FET) in signal amplific Comparison bet the types of (FET, MOS and (valent) Use small cation tween FET FET) (BJT)	Lecture	practical) 1-Direct evaluation. 2-Exams (written + practical)
Twenty- eighth	2	the lessonThestudentmustabletounderstandandsolvescientificproblemsrelatedtothe lesson	Light Deper Resistor (LDI Light Emitting J - Photo Breakout I Seven Structure Applica	ndent R) - Diode diode Board Their and ations	Lecture	1-Direct evaluation. 2-Exams (written + practical)
twenty- ninth & thirty	2	The student must be able to understand and solve scientific problems related to the lesson	The phototransi its structure operation - applications - pi	stor - - its its the rocess	Lecture	1-Direct evaluation. 2-Exams (written + practical)
11. Course	Evaluation					
Distributing preparation,	the score daily oral,	out of 100 accomonthly, or write	ording to the task itten exams, report	s assig s etc	ned to the stud	dent such as daily
تاليف مالفينو، (curricular books, if any) - ترجمة بدر مجد علي الوتار، د. رياض كمال Principles of Electronics 1984, written by Malvino, translated by Badr Muhammad - Ali Al-Wattar, Dr. Riad Kamal					مبادئ الالكترونيا عا pnics 1984, translated by Ali Al-Wattar,	
Main referer	nces (source	es)		Indu by	۱ تاليف ضياء نس، حلمي أمين strial Electroni Diya Mahdi	ترونيك الصناعي ۹۸۵ مهدي فارس ، نبيل - يو ics 1985, written Fares, Nabil -

	Younis, Helmi Amin
Recommended books and references (scientific	semiconductors (K.I. Gross &
journals, reports)	J.Y. Rwood)
Electronic References, Websites	م المعهد التقني/ الرميثة، مواقع الشركات
	العالمية
	Website of the Techni
	Institute/Rumaitha, websites
	international companies

1 Co	Man Nom				
1. Co	urse Nam	e:	N - 41 41		
2 Car	una Cada		Mathematics		
2. C0	urse Code	<i>.</i>	DELEC1005		
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4 D-			Annuai		
4. Des	scription	Preparation Dat	e:		
5 1		ton don oo Form			
5. AV	allable Al	lendance Form			
6 Nu	mbor of (Pradit Hours (T	atal) / Number of Units (Total)		
0. INU.			annual hours (theoretical hours		
7 . Co	urco odmi	120	annual nours (meoretical nours)	5) (ma)	
7. Co	urse admi	mstrator s name	e (menuon all, 11 more than one ha	ame)	
Inal Em	me: Sena	m Adaul Huss hm@atu adu ia	em wassan		
	urso Obio	ativos			
$\begin{array}{c} 0 \\ \mathbf{C} \\ 0 \\ $	uise Obje	LIVES 1 Und	arctand simple mathematical la	wa and agus	tions
Course Of	ojectives	1- Ullu 2. Und	lerstanding the main concents a	ws and equa	the rules and
		2- Ullu	of mothematics and their	nu Knowing	in clostrical
		tochno	logios	аррпсаноп	in electrical
			Mathematics Tonic aims to	clarify the	nractical and
		nhiloso	whice chellenges of current	onginooring	mathematics
		that sti	imulated this	engineering	mathematics
		Contin	uous develonment as well	as nresenti	ng the basic
		concen	ts of calculus that are usef	ul for furt	her study of
		engine	ering sciences and mathematics		ner study or
		Applie	d in the scientific and practical	fields	
		4- Stud	lents acquire skills to solve topic	 CS.	
9. Tea	aching and	d Learning Stra	tegies		
Strategy	8	1. Dev	eloping students' ability to dis	scuss and re	each the most
~8,		appror	priate solutions to problems	and exer	cises through
		brains	torming and management		
		Discus	sions by the teacher.		
		2. Giv	ing students extracurricular	assignments	that require
		them t	o apply skills and self-explanation	ons in exper	imental ways.
		3. Dev	eloping the student's ability fo	r theoretica	l analysis and
		deduct	ion.		-
		4. Dev	eloping the student's ability to l	ink mathem	atics topics to
	sensory reality and their applications in public life.				
10. Course Structure					
Week	Hours	Required	Unit or subject name	Learning	Evaluation
		Learning		method	method
		Outcomes			
First	2	The	Matrices / determinants /		1-Direct
		student	and their properties	Lecture	evaluati
		must be			on.

Second	abletounderstandandsolvescientificproblemsrelatedtothe lesson2Thestudentmustbeabletounderstandandsolvescientificproblemsrelatedtothe lesson	Solving linear equations - Cramer's method - Applications to determinants - Using the compensation method to find the value of currents in a multi-source electrical circuit	Lecture	2-Exams (writt en + practi cal) 1-Direct evaluati on. 2- Exams (written + practical)
Third	2 The student must be able to understand and solve scientific problems related to the lesson	Vectors / Vector analysis / Vector and scalar quantities / Vector algebra / Vector arithmetic in space Phase and directional representation of alternating quantities, phase angle - finding the resultant of vector quantities	Lecture	1-Direct evaluati on. 2- Exams (written + practical)
Furid	2 The student must be able to understand and solve scientific problems related to the lesson	Unit of orthogonal vectors / vector scale / scalar and vector multiplication / applications to vectors / magnetic flux / Maxwell / numerical multiplication of vectors using angle / numerical multiplication of vectors using coordinates	Lecture	1-Direct evaluati on. 2- Exams (written + practical)
Fifth	2 The student must be able to understand and solve scientific problems related to the lesson	Function/trigonometric functions and trigonometric relationships/logarithmic functions Calculating the DC current value for a semi-bridge circuit / Calculating the effective value of the line voltage / load of the transistor	Lecture	1-Direct evaluati on. 2- Exams (written + practical)
Sixth	2 The student must be able to	ExponentialfunctionHyperbolicfunctionsApplicationsofdrawingexponentialfunctions	Lecture	1-Direct evaluati on. 2- Exams

	understand	first-order electrical circuit,		(written
	and solve	representing an R-C filter		+
	scientific	circuit with an exponential		practical
	problems	function)
	related to			
	the lesson			
Seventh	2 The	Objectives / Objectives of	Lecture	1-Direct
	student	algebraic and trigonometric		evaluati
	must be	functions / Applications to		on. 2-
	able to	objectives		Exams
	understand			(written
	and solve			+
	scientific			practical
	problems)
	related to			
	the lesson			
Eighth	2 The	Differentiation / derivative /	Lecture	1-Direct
_	student	derivative of algebraic		evaluati
	must be	functions / chain rule -		on. 2-
	able to	building a differential circuit		Exams
	understand	/ calculating speed and		(written
	and solve	acceleration - speed of light		+
	scientific	• 0		practical
	problems)
	related to			,
	the lesson			
Ninth	2 The	Implicit function / higher-	Lecture	1-Direct
	student	order derived standard		evaluati
	must be	function / representing a		on. 2-
	able to	physical system with the		Exams
	understand	implicit function		(written
	and solve	F		+
	scientific			practical
	problems)
	related to			,
	the lesson			
The tenth		Derivative of trigonometric	Lecture	1-Direct
	student	functions / Derivative of	Lecture	evaluati
	must he	logarithmic functions /		on 2-
	able to	Calculating the effective		Exams
	understand	value of the current in the R.		(written
	and colve	L-C circuit / Voltage gain in		(WIRCEN
	scientific	the hill		nractical
	nrohloms	the bin)
	rolatod to			,
	the lesson			
alayarth		Derivative of an entry inter	I.c.	1 Dim of
eleventn	a ine	functions (derivative of	Lecture	1-Direct
	student	hunchons / derivative of		evaluati
	must be	nyperbolic functions /		on. 2-
	able to	calculation of the time		Exams
	understand	constant		(written

· · · · ·		11		
	and solve			+
	scientific			practical
	problems)
	related to			
	the lesson			
twelveth	2 The	Applications of the	Lecture	1-Direct
	student	derivative/tangent and		evaluati
	must be	perpendicular		on. 2-
	able to	equation/velocity and		Exams
	understand	acceleration/change		(written
	and solve	Calculations of the rate of		+
	scientific	change of voltage and		nractical
	nrohlems	current as a function of time)
	rolated to	current as a function of time)
	the losson			
Thirtoonth		Increasing and decreasing (Lootumo	1 Dimont
1 mileenth		moving and minime (Lecture	
	student	maxima and minima /		evaluati
	must be	finitection points / drawing		on. 2-
	able to	functions		Exams
	understand	Response plot of a second		(written
	and solve	order circuit R-L-C		+
	scientific			practical
	problems)
	related to			
	the lesson			
fourteenth	2 The	General physics and	Lecture	1-Direct
	student	engineering applications		evaluati
	must be			on. 2-
	able to			Exams
	understand			(written
	and solve			+
	scientific			practical
	problems)
	related to			
	the lesson			
Fifteenth	2 The	Integration / indefinite	Lecture	1-Direct
	student	integration / integration of		evaluati
	must be	algebraic and logarithmic		on. 2-
	able to	functions. Calculating the		Exams
	understand	value of an expanded		(written
	and solve	shinment		+
	scientific	Simplifont		nractical
	nrohlems)
	rolated to)
	the losson			
sixtoonth	1 Tho	Integration of ornanatial	Lootumo	1-Direct
Sixteentii	4 Ille student	and trigonometric functions	Lecture	1-Direct
	student	and ungonometric functions		evaluati
	must be			on. 2-
	able to			Exams
	understand			(written

	scientific problems related to the lesson			practical)
seventeenth	2 The student must be able to understand and solve scientific problems related to the lesson	Definite integration / Applications of definite integration / Area under the curve / Area between two curves / Electrical power calculations	Lecture	1-Direct evaluati on. 2- Exams (written + practical)
eighteenth	2 The student must be able to understand and solve scientific problems related to the lesson	Rotational volumes / arc length of the curve	Lecture	1-Direct evaluati on. 2- Exams (written + practical)
nineteenth	2 The student must be able to understand and solve scientific problems related to	Physical and engineering applications (work - torque - momentum - moment of inertia)	Lecture	1-Direct evaluati on. 2- Exams (written + practical)
twenty one & twenty tow	2 The student must be able to understand and solve scientific problems related to the lesson	General methods of integration include substitution, division, and the use of partial, exponential, and logarithmic fractions Building an integrator circuit using resistance and inductance / representing an electrical circuit using integral equations / an amplifier circuit using an integrated circuit	Lecture	1-Direct evaluati on. 2- Exams (written + practical)
twenty third	2 The student must be able to	Numerical methods in integration / trapezoid rule / Simpson's rule Find distance from	Lecture	1-Direct evaluati on. 2- Exams

	understand	acceleration and velocity		(written
	and solve	Finding the value of the		+
	scientific	effective current of a		practical
	problems	rectifier)
	related to			
	the lesson			
twenty	2 The	Solving discrete,	Lecture	1-Direct
fourth	student	homogeneous and linear		evaluati
&	must be	differential equations with		on. 2-
Twenty.	able to	their various applications		Exams
fifth	understand	within the field of		(writton
mu	and solvo	specialization / positive		(written
	anu solve	specialization / positive,		T nreatice]
	scientific	negative and compound		practical
	problems	pruning circuits)
	related to			
	the lesson			
twenty-	2 The	Complex numbers / addition,	Lecture	1-Direct
sixth	student	subtraction, multiplication		evaluati
	must be	and division / geometric		on. 2-
	able to	representation of complex		Exams
	understand	numbers / the relationship of		(written
	and solve	electrical units to complex		+
	scientific	numbers		practical
	problems)
	related to)
	the lesson			
Twenty-		The polar formula /	Lecture	1-Direct
seventh	student	converting an algebraic	Letture	evaluati
seventin	must he	characteristic to polarity and		on 2-
	able to	vice verse / the sign of the		Exome
	able to	vice versa / the sign of the		L'Allis (wwitten
		coefficient (j) in electronic		(written
	and solve	circuits / the exponential		+
	scientific	formula in conversion / de		practical
	problems	Moniz's theory and its uses)
	related to	in solving complex electrical		
	the lesson	circuits / calculations of		
		power transmission lines		
		using line constants		
Twenty-	2 The	Forces and roots /	Lecture	1-Direct
eighth	student	Representing roots by		evaluati
	must be	drawing / Finding the roots		on. 2-
	able to	of electrical circuits to		Exams
	understand	determine stability / Star and		(written
	and solve	triangle representation		+
	scientific			practical
	problems)
	related to			,
	the lesson			
twonty		Statistical anarctions /	Looturo	1 Dimont
iwenty-	4 I IIE atudant	frequency distributions /	Lecture	1-Direct
nintn	suaent	history distributions /		evaluati
	must be	nistogram / frequency curve		on. 2-

	able to understand and solve scientific problems related to the lesson	/ probability and ra arithmetic and geon mean - s	nge / netric ample	Exams (written + practical)	
thirty	² The student must be able to understand and solve scientific problems related to the lesson	Arithmetic mean / standard deviation variance, dispersion relative / relation between mean, median mode / coefficient variation - standard va	range Lecture / and onship n and t of riable	1-Direct evaluati on. 2- Exams (written + practical)	
11. Course E	valuation				
Distributing th	e score out of 100 a	according to the tasks ass	signed to the studer	nt such as daily	
preparation, da	uly oral, monthly, or	written exams, reports e	tc		
12. Learning	and Teaching Resour	rces		11 11 7 77	
Required textb	ooks (curricular bool	ks, if any)	حصول على المصادر ضافرة المزاهج الدر اسرة	مكنية المعهد للـ VI	
			The institute's libr	[⊿] '. arv for	
			additional curricul	a resources.	
Main reference	es (sources)		George B. Thomas, Jr.,		
			"Thomas 'Calculus", 12th		
			edition, Addiso	n Wesley,	
-			Pearson Education	, Inc, 2010.	
reports)			جميع المجلات العلمية الرصيبة التي ته علاقة بالمفهوم الواسع للرياضيات و المثلثات الكروية All solid scientific journals that are related to the broad concept		
			of mathematics triangles	and spherical	
Electronic Ref	erences, Websites		Internet sites mathematics an triangles	related to d spherical	

1 0	1 Course Name					
1. Cou	1. Course Name:					
2 0	C l		Labs			
2. Cou	rse Code:					
2 5			RELECI004			
<u> </u>	iester / Yea	ar:	A			
4 Dec	anintian Du	an anotion Datas	Annual			
4. Des	cription Pr	eparation Date:				
5 410	ilabla Atta	ndonco Forma				
J. Ava	mable Alle		Practical lactures			
6 Nur	nber of Cr	I dit Hours (Total) / N	Jumber of Units (T	(otal)		
0. 1101		1 / (10001)	$\frac{1}{10000000000000000000000000000000000$	Otal)		
7 Cou	rse admini	strator's name (ment	ion all if more that	n one name)		
7. Cou Nan	ne Khang	a Abdul-Reza Sug	nair	ii one name)		
Em	ail:					
8. Cou	rse Object	ives				
Course Ob	iectives	1. Uses the	various devices.	tools, and com	ponents used in	
	J	workshops.		,	······	
2. Acquires technical skill and			and experience	in the field of		
		various elec	ctrical maintenanc	e works.		
		3. Gain self	-confidence to pra	actice electrical to	echnical work in	
		tracking fat	ults and learning h	now to repair the	m.	
		4. Distingu	ish and identify	various electrica	l and electronic	
		component	components and how to use them in building various circuits.			
		5. Learn ho	ow to use the devi	ices, tools, and n	nachines used in	
0	1 . 1	workshops	to assist in electric	cal maintenance	work.	
9. Tea	ching and	Learning Strategies		4h - h	.]] ² 4 ²	
Strategy		1. Proviain	g students with	the dasics and a	additional topics	
		related to the previous learning outcomes of the skills, to solve				
		Practical problems 2 Applying the topics studied theoretically at the practical				
		2. Applying the topics studied theoretically at the practical level in the denartment's various workshops -				
		3. Organi	3. Organizing visits and scientific trins to electrical			
		maintenanc	maintenance workshops in production sites			
		4. Use of hand tools and measuring tools and the ability to				
		work and o	work and operate machines in the optimal manner			
		5. Showing	5. Showing scientific films about maintaining electrical			
appliar					0	
10. Cours	e Structure					
Number	Hours	Required	Unit or subject	Learning	Evaluation	
of Weeks	Every	Learning	name	method	method	
	week	Outcomes	nunit	memou	incurve	
		The student		**7 * *	1-Direct	
		must be able to	The #14	Workshop	evaluation.	
,	0	understand and	i ne mings	and Johoratorias	2-Exams	
		suive scientific		laboratories	(written	
		problems			+	

		related to the				practical
		lesson)
٣	6	The student must be able to understand and solve scientific problems related to the lesson	Weldin	g	Workshop and laboratories	1-Direct evaluation. 2-Exams (written + practical)
٣	6	The student must be able to understand and solve scientific problems related to the lesson	Plumbir	ng	Workshop and laboratories	1-Direct evaluation. 2-Exams (written + practical)
٣	6	The student must be able to understand and solve scientific problems related to the lesson	Lathin	g	Workshop and laboratories	1-Direct evaluation. 2-Exams (written + practical)
٣	6	The student must be able to understand and solve scientific problems related to the lesson	Carpent	ry	Workshop and laboratories	1-Direct evaluation. 2-Exams (written + practical)
15	6	The student must be able to understand and solve scientific problems related to the lesson	electric Worksho	e o p	Workshop and laboratories	1-Direct evaluation. 2-Exams (written + practical)
11. Cours	e Evaluati	on				
Distributing	g the score	e out of 100 accordi	ing to the tas	sks as:	signed to the stud	ent such as daily
12 Learni	, daily of a	aching Resources	r exams, repo	118	elc	
Required te	xtbooks (c	curricular books, if an	ny)	Lab	oratory notebook f	for each
-				work	tshop	
Main refere	ences (sour	rces)		1- moo 2- tran Fran 3- elec	Winding electric on - Reference i asformers, - Sonklin Electronics in the etrical application	motors, Dr. n electrical S.A. Sticant, he service of ns. Noel M.
				Ma	urice	

Recommended books and references (scientific journals, reports)	 Identifying faults and maintaining electrical machines. Prepared by the World Bank - for technical illustrations. Fundamentals and maintenance of transistor circuits, written by Larson
Electronic References, Websites	Website of the Technical Institute/Rumaitha, websites of international companies

1 Course N	1 Course Name						
	vanie.	C	omputer applications				
2. Course (Code:		mputer uppreutions				
			RELEC1006				
3. Semester	r / Year:						
			Annual				
4. Descript	ion Prepar	ation Date:					
1	1		5/7/2021				
5. Availabl	e Attendar	nce Forms:					
		Theoretica	al lectures, practical lectu	res			
6. Number	of Credit	Hours (Total) /	Number of Units (Total)				
			90 annual hours				
7. Course a	dministrat	or's name (mer	ntion all, if more than one n	ame)			
Name: S	eham Ab	dul Hussein M	assan				
Email: 1	kin.shm@a	atu.edu.iq					
8. Course C	Objectives						
Course Objecti	ves	Teachi	ng the student the basi	cs of comp	outer operating		
		progra	ms and the most im	portant co	mmands, then		
		enterir	ng the AUTO CAD dr	awing prog	gram, learning		
		about	the drawing interface	and the	drawing and		
		modifi	cation commands, ente	ering 3D	drawing, then		
		learnin	ig about the concept of	viruses an	d the speed of		
0 Taashira	~ ~ d T ~ ~ ~	comba	ting them.				
9. Teaching	g and Lear	1 Uor	awark aggignmontg				
Strategy		1. Homework assignments 2. Theoretical lactures					
		2. The 3. App	3 Applied skills within the laboratory				
		4 Clas	4. Class discussion				
		4. Club	5 discussion				
		Preparing a	nd implementing research	n and proje	cts by students		
		within the department's subjects, including computer applications					
		and presenting them at annual student conferences.					
		Developing	and updating the voc	abulary of	the computer		
		applications subject to keep pace with developments in order to					
		achieve pers	achieve personal development at the level of students.				
10. Course Str	ucture						
Week	Hours	Required	Unit or subject name	Learning	Evaluation		
		Learning		method	method		
		Outcomes			1.D.		
First + Second	2	The	Introduction to	Trat	1-Direct		
		student	their herefts	Lecture	evaluatio		
		must De	uneur Denemus,		II. 2-Evoma		
		avic iv understand	generations,		2-127ams (writto		
		and solve	calculator narte		n +		
		scientific	nhysical calculator		nractic		
		problems	components and		al)		
1		r ¹ uniting	components and	l	••••		

	related to the lesson	means of input and output, software, memory measurement units, definition of files and folders.		
Third+ fourth	2 The student must be able to understand and solve scientific problems related to the lesson	Windows 7 operating system, system features, basic requirements for operation, components of the main desktop screen DESKTOP, the concept of the icon, the method for dealing with mouse activities, the importance and components of the TASKBAR taskbar, using START to enter programs, exiting the system and turning off the calculator	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)
Fifth+ Sixth	2 The student must be able to understand and solve scientific problems related to the lesson	The concept of the window and recognition of its main components Dealing with the COMPUTER icon, MY DOCUMENTS, RECYCLE BIN, copying files and folders, cutting and pasting	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)
Seventh+ Eighth	2 The student must be able to understand and solve scientific problems related to the lesson	File, folder and disk properties, change desktop wallpaper DESKTOP BACKGROUND, WINDOWS COLOR, SCREEN SAVER	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)
Ninth + The tenth	2 The student must be able to understand and solve scientific	Getting to know the CONTROL PANAL, mouse properties, programs and their features, PROGRAM AND FEATURES, and how to delete	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)

	problems	installed programs,		
	related to	getting to know some		
	the lesson	ACCESSORIES such		
		as the		
		CALCULATOR		
		WORDPAD and		
		WINDOSWS MEDIA		
		DI AVED to play video		
		files		
			T	1. D'
	2 Ine	AUTOCAD program:	Lectur	1-Direct
eleventh	student	its definition,	e	evaluatio
	must be	importance,		n. 2-
	able to	installation, and		Exams
	understand	operation. Getting to		(written +
	and solve	know the program		practical)
	scientific	interface and ways to		
	problems	access commands,		
	related to	creating a new file,		
	the lesson	storing and opening		
		files, auxiliary		
		commands,		
		DRAWING LIMITS.		
		UNITS.		
twelveth	2 The	Commands:OSNAP (Lectur	1-Direct
tweiven	student	ORTTHO (LWT (P	evaluatio
	must he	OTRACK (POLAR (C	n 2-
	able to	SNAD (CDID (II. 2- Evome
	able to	DISTANCE ADEA		L'Xallis (writton
	understand	DISTANCE · AREA		(written +
	and solve			practical)
	scientific			
	problems			
	related to			
	the lesson			
Thirteenth	2 The	VIEW TOOLS:	Lectur	1-Direct
	student	ZOOM command,	e	evaluatio
	must be	PAN command,		n. 2-
	able to	REGEN command		Exams
	understand			(written +
	and solve			practical)
	scientific			
	problems			
	related to			
	the lesson			
Fourteenth	2 The	Basic drawing	Lectur	1-Direct
+	student	commands DRAW :	e	evaluatio
Fifteenth	must be	LINE · MULTILINE ·	-	n. 2-
+	able to	CONSTRUCTION		Exams
sixteen	understand			(writton +
SIAUUII	and solve	POLYCON		nraotical)
	and solve	DECTANCIE ADC		practical)
	scientific	RECIANGLE ' AKC		
	problems	CIKCLE: DONUT		

	related to the lesson	'REVCLOUD 'SPLINE ' ELLIPS 'MACKE BLOCK 'INSERT BLOCK 'MBLOCK 'WBLOCK HATCH'REGION		
Seventeenth + eighteen	2 The student must be able to understand and solve scientific problems related to the lesson	Modification orders MODIFY :ERASE (COPY (MIRROR (OFFSET(ARRAY (MOVE (ROTATE (SCALE (CHAMFER (FILLET (STRETCH (TRIM (EXTEND (BREAK (EXPLODE	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)
Nineteenth + Twenty	2 The student must be able to understand and solve scientific problems related to the lesson	TEXT writing commands and their modification: MULTILINE TEXT, SINGLE LINE TEXT, how to create new writing style forms, getting to know the DESIGN CENTER and benefiting from ready-made electrical templates.	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)
twenty one + twenty tow	2 The student must be able to understand and solve scientific problems related to the lesson	Division commands: MEASURE, DIVIDE, controlling drawing specifications: LINETYPE, LINE WEIGHT, COLOR, modifying graphic properties using: PROPERTIES, MATCH PROPERTIES, GRIPS	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)
twenty third	2 The student must be able to understand and solve scientific problems related to the lesson	DIMENSION	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)

_	_1			-	
twenty fourth	2 The stuc mus able und and scie pro rela the	lent st be erstand solve ntific blems ted to lesson	Introduction to 3D drawing, features of 3D drawing, types of 3D drawings, learning about the ELEV and THICKNESS commands.	e Lectur	1-Direct evaluatio n. 2- Exams (written + practical)
Twenty-fifth + twenty-sixth	2 The stud mus able und and scie pro rela the	lent st be e to erstand solve ntific blems ted to lesson	Preview 3D drawing using 3DVIEW, split screen 3D drawing using VPORTS, User Coordinate System UCS	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)
Twenty- seventh + Twenty-eighth	2 The stuc mus able und and scie pro rela the	lent st be erstand solve ntific blems ted to lesson	Creating 3D surfaces with 3D SURFACE Creating three- dimensional solid objects with 3D SOLIDS	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)
Twenty-ninth + Thirty	2 The stuc mus able und and scie pro rela the	lent et be erstand solve ntific blems ted to lesson	The concept of computer viruses, motives for the spread of viruses, how to become infected with viruses, types of viruses according to the nature of infection and damage, signs of viruses infecting computers, precautions that must be taken to avoid viruses entering computers, dealing with an anti-virus	Lectur e	1-Direct evaluatio n. 2- Exams (written + practical)
11.0 -			program		
11. Course Ev	aluation	100	1		
I A S a A a S I a a A S a A A I a A	score out of	(1) (1) (1) (1)	rding to the tasks assigned	to the stud	ent such as daily
Distributing the		100 acco		to the stud	ent such as any
preparation, dail	y oral, monthly	, or writ	ten exams, reports etc		ent such us duny

Required textbooks (curricular books, if any)	Methodical books
Main references (sources)	References related to the subject
	and found in the institute's
	library
Recommended books and references (scientific journals,	Books and magazines related to
reports)	computers: basics, applications,
	using Autocad, viruses
Electronic References, Websites	The Institute's website, various
	Internet sources, websites of
	international companies

1. Course Name:					
	Engineering and electrical drawing				
2. Course Code:					
	RELEC1007				
3. Semester / Year:					
	Annual				
4. Description Prep	aration Date:				
**	1 / 7 / 2021				
5. Available Attend	ance Forms:				
	Practical lectures				
6 Number of Credi	t Hours (Total) / Number of Units (Total)				
	90 annual hours				
7 Course administr	rator's name (mention all if more than one name)				
Name	ator 5 humo (montion an, ir more than one nume)				
Fmail.					
Linan.					
8 Course Objective					
Course Objective	1 This course sims to domonstrate the importance of				
Course Objectives	1. This course aims to demonstrate the importance of studying engineering and electrical dynaming				
	Studying engineering and electrical drawing.				
	2. The student's familiarity with the foundations and rules of				
	engineering and electrical drawing that will benefit him in his				
	specialized studies and practical life.				
	3. The student will be able to build his imagination around				
	the subject of the drawing.				
	4. The student will be able to know engineering rules and				
	theories.				
	5. The student will be able to develop speed resulting from				
	alertness, frequent practice, and following proper methods.				
	6. The student uses computer software in engineering and				
	electrical drawing.				
	7. Identify electrical symbols and draw various electrical				
	diagrams.				
9. Teaching and Learning Strategies					
Strategy	1. Using modern means to present the theoretical and				
	practical aspects, such as electronic display devices Different				
	ways to attract attention and attract students so that the idea				
reaches the student better.					
2. Giving students extracurricular assignments that req					
	the use of skills and self-explanations in experimental ways.				
	3. Interrogating students through discussion sessions by				
	asking intellectual questions (how, why, when, Where, which)				
	for specific topics.				
	4. Using brainstorming and feedback methods in order to				
	activate the accumulated experiences of students By linking				
	the academic subjects taken in the previous academic levels				
	· • •				

		and lin	king them to the new or	165	
		5. Pro	viding students with	oractical skill	s by conducting
		practic	cal		
10. Course	e Structure	· •			
Week	Hours	Required	Unit or subject name	Learning	Evaluation
		Learning		method	method
		Outcomes			
The first	3	The	The importance of	Lecture	1-Direct
		student	engineering drawing.		evaluation.
		must be	Recognizing the		2-Exams
		able to	interfaces of		(written
		understand	AutoCAD.		+
		and solve	ways to execute		practical)
		scientific	AutoCAD		
		related to	to exit them		
		the lesson	Navigate between		
			interfaces. show		
			menus, show and		
			hide bars.		
The second	3	The	Methods of drawing	Lecture	1-Direct
		student	a straight line using		evaluation.
		must be	Cartesian		2-Exams
		able to	coordinates, the		(written +
		understand	relative method and		practical)
		and solve	the polar method.		
		scientific			
		problems related to			
		the lesson			
The third	3	The	Display commands.	Lecture	1-Direct
	Ũ	student	dimensions of the	Lecture	evaluation.
		must be	working		2-Exams
		able to	environment,		(written +
		understand	drawing boundaries		practical)
		and solve	and units, save the		
		scientific	file and then it can be		
		problems	opened in a previous		
		related to	version of the		
		the lesson	program using the		
			Iollowing commands:		
			Limits Units		
			Ontions)		
The fourth	3	The	Drawing accuracy	Lecture	1-Direct
	5	student	orders	Licture	evaluation.
		must be	SNAP, GRID.		2-Exams
		able to	ORTHO, POLAR,		(written +
		understand	OSNAP, OTRACK,		practical)
		and solve	DUCS, DYN, LWT((
		scientific	Drawing isometric		

		Γ	1		1
		problems related to	objects using the GRID command		
		the lesson			
Fifth	3	The student	Commands for drawing elements:	Lecture	1-Direct evaluation.
		must be)Rectangle, Circle,		2-Exams
		able to	Polygon, Arc, Ellipse,		(written +
		understand	Donut, Wipeout,		practical)
		and solve	Revision Cloud(
		scientific			
		problems			
		related to			
C' 41	2	the lesson		T	1 D'
Sixth	3	Ine	Modification orders	Lecture	1-Direct
		student)Erase, Copy, Move, Minnon Offset Scole		evaluation.
		able to	Stratch Potato(2-Exams
		understand	Stretch, Notate		nractical)
		and solve			practical
		scientific			
		problems			
		related to			
		the lesson			
Seventh	3	The	Setting different	Lecture	1-Direct
		student	dimensions on		evaluation.
		must be	drawing elements		2-Exams
		able to	and controlling them		(written +
		understand	using the Dimensions		practical)
		and solve	Style dialog box		
		nrobloms	Linear, Aligheu, Arc		
		related to	Diameter Angular		
		the lesson	Baseline, Continue, -		
			Mleader. Dimension		
			Style		
Eighth	3	The	Control drawing	Lecture	1-Direct
0		student	specifications (types		evaluation.
		must be	of lines, colors of		2-Exams
		able to	elements, their		(written +
		understand	properties, and		practical)
		and solve	transferring		
		scientific	properties to another		
		problems	element (Match		
		related to	Properties))		
	2	the lesson	Other major element	Locture	1 Direct
NI: 41-	4	Ine	Other major element	Lecture	1-Direct
Ninth	5	student	drawing ordered		avaluation
Ninth	5	student must be	drawing orders: (Polyline Point		evaluation.
Ninth	5	student must be able to	drawing orders: (Polyline, Point, Spline Helix Table)		evaluation. 2-Exams (written +
Ninth	5	student must be able to understand	drawing orders: (Polyline, Point, Spline, Helix, Table)		evaluation. 2-Exams (written + practical)

		ſ			· · · · · · · · · · · · · · · · · · ·
		scientific			
		problems			
		related to			
		the lesson			
The tenth	3	The		Lecture	1-Direct
		student	Other modification		evaluation.
		must be	commands: (Array,		2-Exams
		able to	Trim. Extend. Break.		(written +
		understand	Fillet. Chamfer.		nractical)
		and solve	Explode Align)		pructicui)
		scientific	Explore, ingn/		
		nrohlems			
		related to			
		the lesson			
Elever 4h	2		Adding Single Line	Lastaria	1 Direct
Lieventii	3	1 ne	Adding Single Line	Lecture	1-Direct
		student	a multime 1 ext, its		evaluation.
		must be	methods and		2-Exams
		able to	controlling its		(written +
		understand	specifications.		practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
Twelveth	3	The	Calculate areas	Lecture	1-Direct
		student	(Area), volumes		evaluation.
		must be	(Distance), point		2-Exams
		able to	coordinates (ID		(written +
		understand	Point), and item		practical)
		and solve	specifications (List)		
		scientific	using the Inquiry		
		problems	command.		
		related to	Handling Parametric		
		the lesson	bar orders		
Thirteenth	3	The	Hatch, Gradient, and	Lecture	1-Direct
		student	sectors		evaluation.
		must be			2-Exams
		able to			(written +
		understand			practical)
		and solve			_
		scientific			
		problems			
		related to			
		the lesson			
fourteenth	3	The	Layers and	Lecture	1-Direct
		student	controlling their	-	evaluation.
		must be	settings.		2-Exams
		able to			(written +
		understand			practical)
		and solve			Fracticut)
		scientific			
		scientific			

		problems			
		related to			
		the lesson			
Fifteenth	3	The	Blacks their types	Locturo	1_Direct
rnteentn	3	atudant	inclusions and	Lecture	1-Direct
		student	inclusions, and		evaluation.
		must be	control of their		2-Exams
		able to	specifications.		(written +
		understand			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
Sixteen	3	The	Convert drawing	Lecture	1-Direct
		student	from 2D to 3D		evaluation.
		must be	commands		2-Exams
		able to)Region, Boundary,		(written +
		understand	Join(practical)
		and solve	× ×		•
		scientific			
		problems			
		related to			
		the lesson			
Seventeenth	3	The	Surfaces and objects	Lecture	1-Direct
		student	Basic 3D shapes		evaluation.
		must be	commands		2-Exams
		able to)Box. Wedge. Cone.		(written +
		understand	Sphere, Cylinder,		practical)
		and solve	Tours, Pyramid(1 /
		scientific			
		problems			
		related to			
		the lesson			
Eighteen	3	The	Commands for	Lecture	1-Direct
Lighteen	U	student	creating 3D objects	Lecture	evaluation
		must he	(Extrude Press/null		2-Exams
		able to	Polysolid Union		2-DAms
		understand	Subtract Intersect		(written +
		and solvo	Boyolyo Swoon Loft		practical)
		sciontific	Kevolve, Sweep, Lott		
		nrohloms	,		
		problems			
		related to			
		the lesson		T 4	1.D.
nineteenth	3	I ne	Company 1 P	Lecture	1-Direct
		stuaent	Commands for		evaluation.
		must be	modifying objects		2-Exams
		able to)Shell, Separate,		(written +
		understand	Slice, Thicken(practical)
		and solve	Working with		
		scientific	coordinate bar		
		problems	commands (Ucs)		

		related to			
		the lesson			
Twentieth	3	The student must be able to understand and solve scientific problems related to	Drawing projections, using program commands to show the projection	Lecture	1-Direct evaluation. 2-Exams (written + practical)
		the lesson			
Fwenty first	3	The student must be able to understand and solve scientific problems related to the lesson	printing	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty tow	3	The	Drawing electrical	Lecture	1-Direct
		student must be able to understand and solve scientific problems related to the lesson	Use the program library to use the icons in the Design Center Draw symbols that are not in the program Save the symbols in a special file for use in new files		evaluation. 2-Exams (written + practical)
「wenty third	3	The student must be able to understand and solve scientific problems related to the lesson	Draw some electrical and electronic circuits Draw input and output sine waves or any other wave	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty	3	The	Draw a drive circuit	Lecture	1-Direct
fourth		student must be able to understand and solve scientific	and control circuit for a motor		evaluation. 2-Exams (written + practical)

Fwenty fifth	3	problems related to the lesson The student must be able to understand and solve scientific problems related to the lesson	An example of the foundations of a small building or residential house.	Lecture	1-Direct evaluation. 2-Exams (written + practical)
ſwenty sixth	3	The student be able to understand and solve scientific problems related to the lesson	Drawing models of cable trays.	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty seventh	3	The student must be able to understand and solve scientific problems related to the lesson	The importance of engineering drawing. Recognizing the interfaces of AutoCAD. Ways to execute AutoCAD commands, and ways to exit them. Navigate between interfaces, show menus, show and hide bars.	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty eighth	3	The student must be able to understand and solve scientific problems related to the lesson	Methods of drawing a straight line using Cartesian coordinates, the relative method and the polar method.	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty ninth	3	The student must be able to understand	Display commands, dimensions of the working environment, drawing boundaries	Lecture	1-Direct evaluation. 2-Exams (written + practical)

Thirty	3	and solve scientific problems related to the lesson The student must be able to understand and solve scientific problems related to	and units, save file and then it ca opened in a pre- version of program using following comma (Zoom, dra Limits, U Options) Drawing accu o SNAP, GRID, ORTHO, POLA OSNAP, OTRA DUCS, DYN, LW Drawing ison objects using GRID command	e the an be vious the the ands: wing Jnits, uracy rders R, CK, VT((netric the	Lecture	1-Direct evaluation. 2-Exams (written + practical)
11 Course	Evoluctio	the lesson				
Distributing	the score	$\frac{11}{100}$ and $\frac{100}{100}$	ording to the task	e accio	med to the stu	dent such as daily
preparation	daily oral	monthly or wr	itten exams, report	s assig		ucin such as ually
12. Learni	ng and Tea	ching Resource	es	ci	~	
Required tex	xtbooks (cu	urricular books.	if any)	Meth	odological voc	abulary
Main references (sources)			Ret	ferences ava titute's library	ilable in the	
Recommend	ded book	s and refere	ences (scientific	1- Various magazines specialized in		
journals, rep	oorts)			com	puter application	ons
		Electronic Deferences Websites				ation plans
	-					

1. Cour	rse Name:				
		Hı	uman rights and democra	cy	
2. Cour	rse Code:		U	<u> </u>	
			RELEC1008		
3. Sem	ester / Year	•			
			Annual		
4. Desc	cription Pre	paration Date:			
			5 / 7 / 202		
5. Avai	lable Atten	dance Forms:			
C Num	han of Cus	LA Hanna (Tata)	Theoretical lectures	-1)	
6. Num	iber of Crec	iit Hours (10tal	1) / Number of Units (10t	ai)	
7 Cour	rse adminis	trator's name (n	ention all if more than (ne name)	
7. Cour		trator s name (in		me name)	
Ema	il:				
Lina					
8. Cour	rse Objectiv	ves			
Course Obj	jectives	Identif	y and introduce the p	rinciples and	values of human
_		rights	and principles of demo	cracy, and edu	icate generations
		to resp	ect, adhere to, and wor	k by them.	
9. Teac	hing and L	earning Strateg	ies		
10. Course	Strategy1. Using modern means to present the theoretical and practical aspects, such as electronic display devices Different ways to attract attention and attract students so that the idea reaches the student better. 2. Giving students extracurricular assignments that require the use of skills and self-explanations in experimental ways. 3. Interrogating students through discussion sessions by asking intellectual questions (how, why, when, Where, which) for specific topics. 4. Using brainstorming and feedback methods in order to activate the accumulated experiences of students By linking the academic subjects taken in the previous academic levels and linking them to the new ones. 5. Providing students with practical skills by conducting practical10. Course Structure				
Week	Hours	Required	Unit or subject name	Learning	Evaluation
		Outcomes		metnoa	metnoa
First	2	The student must be able to understand and solve	Human rights, their definition, and goals	Lecture	1-Direct evaluation. 2-Exams (written + practical)

			Г		
		scientific problems related to the lesson		• .	
Second	2	The student must be able to understand and solve scientific problems related to the lesson	The roots of human rights and their developments in human history: human rights in ancient and medieval times	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Third	2	The student be able to understand and solve scientific problems related to the lesson	Human rights in ancient civilizations, especially the Mesopotamian civilization	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Forth	2	The student must be able to understand and solve scientific problems related to the lesson	Human rights in divine laws, with a focus on human rights in Islam	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Fifth	2	The student must be able to understand and solve scientific problems related to the lesson	Human rights in the Middle Ages: human rights in political doctrines, schools, and theories, human rights in companies and their declarations, revolutions, and constitutions (English documents, American Revolution, French Revolution, Russian Revolution)	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Sixth	2	The student	Human rights in contemporary and	Lecture	1-Direct evaluation.

· · · · · · · · · · · · · · · · · · ·		Г			· · · · · · · · · · · · · · · · · · ·
		must be	modern history:		2-Exams
		able to	international		(written +
		understand	recognition of human		practical)
		and solve	rights since World		
		scientific	War I and the		
		problems	League/United		
		related to	Nations		
		the lesson	1 (whoms		
Savardh	2	The	D agional recognition	Locturo	1 Direct
Seventh	2	1 lle student	of human wighter	Lecture	1-Direct
		student	of numan rights:		evaluation.
		must be	European		2-Exams
		able to	Convention on		(written +
		understand	Human Rights 1950,		practical)
		and solve	American		
		scientific	Convention on		
		problems	Human Rights 1969,		
		related to	African Charter on		
		the lesson	Human Rights 1981		
		the resson	Arab Chartor on		
			Hab Charter on Human Dights 1004		
	2		Hullian Rights 1994.	T	1 D'
Eighth	2	Ine	NGOs and numan	Lecture	1-Direct
		student	rights (International		evaluation.
		must be	Committee of the		2-Exams
		able to	Red Cross, Amnesty		(written +
		understand	International,		practical)
		and solve	Human Rights		
		scientific	Watch)		
		problems	,		
		related to			
		the lesson			
Ninth	2	The	National human	Locturo	1_Direct
	4	student	rights organizations	Letture	1-Direct
		student	rights organizations		evaluation.
		must be			2-Exams
		able to			(written +
		understand			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
The tenth	2	The	Human rights in	Lecture	1-Direct
Int tenth	-	student	Iragi constitutions	Lecture	evaluation
		must ha	hetween theory and		2. Evama
		able 4	noolity		
			reality		(written +
		understand			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
eleventh	2	The	The relationship	Lecture	1-Direct
		-	P		

studentbetween human rights and public freedoms understand and solve scientific problems related to the lessonbetween human freedoms freedoms the Universal Declaration of Human Rightsevaluation. 2-Exams (written + practical)twelveth2The the lesson2-In regional charters and national must be constitutionsLecture1-Direct evaluation. 2-Exams (written + practical)twelveth2The the lessonLecture1-Direct evaluation. 2-Exams (written + practical)twelveth2The the lessonNecessary human rights and collective human rightsLecture1-Direct evaluation. 2-Exams (written + practical)fbirteenth2The student must be able to understand and solve scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)fourteenth2The student student the lessonEccure1-Direct evaluation. 2-Exams (written + practical)fourteenth2The student and solve scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)fifteenth2The student and solve scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)fifteenth2The ad solve scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)<			T			1
must be able to understand and solve scientific problems related to the lessonrights and public freedoms beclaration of Human Rights2-Exams (written + practical)twelveth2The student2-In constitutionsLecture1-Direct evaluation. 2-Exams (written + practical)twelveth2The student2-In constitutionsLecture1-Direct evaluation. 2-Exams (written + practical)twelveth2The studentNecessary human rights and collective human rightsLecture1-Direct evaluation. 2-Exams (written + practical)Thirteenth2The student and solve scientific problems related to the lessonNecessary human rights and collective human rightsLecture1-Direct evaluation. 2-Exams (written + practical)fourteenth2The student and solve scientific problems related to the lessonEconomic, social and cultural human rights and civil and political human rights.Lecture1-Direct evaluation. 2-Exams (written + practical)Fifteenth2The the lessonModern rights: facts in must be able to rights: facts in must be able to and solve scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)Fifteenth2The able to and solve scientific problems related to the right to a clean and solve scientific problems related to the right to a clean and solve scientific problems			student	between human		evaluation.
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IterationHuman Rightsscientific problems related to able2-In charters and national constitutionsLecture1-Direct evaluation. 2-Exams (written + practical)twelveth2The student must be able2-In constitutionsLecture1-Direct evaluation. 2-Exams (written + practical)Thirteenth2The student must be able to understand and solve scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)fourteenth2The student must be able to understand and solve scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)fourteenth2The student must be able to understand and solve scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)fourteenth2The student must be scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)fifteenth2The student and solve scientific problems related to the lessonLecture1-Direct evaluation. 2-Exams (written + practical)fifteenth2The studentModern right to a clean environment, the right to a clean environment, the right to a clean environment, the right to a clean environment, the right to religion problems related to the right to religionLecture			and solve	Declaration of		F)
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eventeenth	2	must be able to understand and solve scientific problems related to the lesson	protection of human rights at the national level, guarantees in the constitution and laws, guarantees in the principle of the rule of law.	Lecture	2-Exams (written + practical) 1-Direct
		student must be able to understand and solve scientific problems related to the lesson	constitutional oversight, guarantees in freedom of the press and public opinion, the role of non-governmental organizations in respecting and protecting human rights.		evaluation. 2-Exams (written + practical)
eighteenth	2	The student must be able to understand and solve scientific problems related to the lesson	Guarantees, respect and protection of human rights at the international level: -The role of the United Nations and its specialized agencies in providing guarantees	Lecture	1-Direct evaluation. 2-Exams (written + practical)
nineteenth	2	The student must be able to understand and solve scientific problems related to the lesson	-The role of regional organizations (the Arab League, the European Union, the African Union, the Organization of American States, the ASEAN Organization) -The role of international, regional non- governmental organizations and public opinion in respecting and protecting human rights	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twentieth	2	The student must be able to	The general theory of freedoms: the origin of rights and freedoms, the	Lecture	1-Direct evaluation. 2-Exams (written +

twenty one	2	understand and solve scientific problems related to the lesson The student must be able to understand and solve scientific problems related to the lesson	project's position on declared rights and freedoms, the use of the term general freedoms. The functional nature of the concept of public freedoms: philosophical considerations of the functional right, structural considerations of the positive right, economic considerations and	Lecture	practical) 1-Direct evaluation. 2-Exams (written + practical)
twenty tow & twenty third	2	The student must be able to understand and solve scientific problems related to	public freedoms. The legal rule of the state of law	Lecture	1-Direct evaluation. 2-Exams (written + practical)
twenty fourth	2	the lessonThestudentmustabletounderstandandsolvescientificproblemsrelatedtothe lesson	Regulation of public freedoms by public authorities	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twenty- fifth	2	The student must be able to understand and solve scientific problems related to the lesson	Non-judicial litigation or grievance	Lecture	1-Direct evaluation. 2-Exams (written + practical)
twenty- sixth	2	The student must be	Judicial appeal, determining the state's responsibility	Lecture	1-Direct evaluation. 2-Exams

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related to the lesson related to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources 12. Learning A			problems			
thirty2The student must-Equality between individuals according to their beliefs and raceLecture evaluation. 2-Exams (written + practical)and solve scientific problems related to the lessonand solve scientific problems related to the lessonindividuals according to their beliefs and raceindividuals according to their practical)11. Course Evaluation preparation, daily oral, monthly, or written exams, reports etcindividuals according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc			related to			
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must be able to understand and solve scientific problems related to the lesson individuals according to their beliefs and race 2-Exams (written + practical) 11. Course Evaluation 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources	unn cy	_	student	-Equality between		evaluation.
able to according to their (written + practical) and solve scientific problems (written + practical) problems related to the lesson (written + practical) 11. Course Evaluation Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources			must be	individuals		2-Exams
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Image: stand benefits and race practical) and solve scientific problems related to the lesson 11. Course Evaluation 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources			understand	heliefs and race		nractical
and solve scientific problems related to the lesson 11. Course Evaluation 11. Course Evaluation Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources			and solvo	beners and race		practical)
scientific problems related to the lesson 11. Course Evaluation Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources			allu solve			
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related to the lesson 11. Course Evaluation Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources			provients			
11. Course Evaluation Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources			the leases			
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources	11_Course	Evolustion				
preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources	Distributi		1 aut of 100	anding to the tell '	and to the t	dant and a 1 1
12. Learning and Teaching Resources	Distributing	the score	out of 100 acc	ording to the tasks assign	ned to the stu	uent such as daily
12. Learning and Teaching Resources	preparation,	daily oral,	monthly, or wr	itten exams, reports etc	2	
	12. Learni	ng and Tea	ching Resource	S		
Required textbooks (curricular books, if any)	Methodical books					
---	---					
Main references (sources)	References related to the subject and found in the institute's library					
Recommended books and references (scientific journals, reports)	Books and magazines related to the subject of human rights and democracy					
Electronic References, Websites	The Institute's website, various Internet sources, websites of humanitarian organizations and legal authorities.					

1 Cour	rso Nomo:				
1. Cou	ise maine.		Occupational sofaty		
	rao Codor		Occupational safety		
2. Cou	ise Coue.				
2 Sam	actor / Vaa		KELEC1009		
5. Sem	ester / i ea	r.	A		
4 D	· /		Annual		
4. Desc	cription Pre	eparation Date:			
~		1 5	5/7/2021		
5. Ava:	ilable Atter	idance Forms:			
	1 1 9	11	Theoretical lectures	•	
6. Nun	iber of Cre	dit Hours (Tota	I) / Number of Units (Tot	al)	
			30 annual hours		
7. Cou	rse adminis	strator's name (r	mention all, if more than o	one name)	
Nam	ne:				
Ema	il:				
8. Cou	rse Objecti	ves			
Course Ob	jectives	1- Th	is course aims to de	monstrate the	e importance of
		studyi	ng occupational safety		
		2- The	student's familiarity wi	th the founda	tions and rules of
		occupa	tional safety that will	benefit him i	n his specialized
		studies	and future professional	l life	
		3- The	e student will be able	to know the	general rules to
		preven	t accidents and injuries	during work.	
		4- The	student will be able to r	emain alert, p	ay attention, and
		follow	proper methods		-
9. Teac	ching and L	earning Strateg	gies		
Strategy	-	1. Usi	ng modern means to	present the	theoretical and
		practic	cal aspects, such as elect	ronic display	devices Different
		ways t	o attract attention and a	attract student	ts so that the idea
		reache	s the student better.		
		2. Givi	ing students extracurric	cular assignm	ents that require
		the use	e of skills and self-explan	ations in expe	erimental ways.
		3. Int	errogating students th	rough discus	sion sessions by
		asking	intellectual questions (h	low, why, whe	n. Where, which)
		for spe	cific topics.	- · · , · · · J , · · · ·	,
		4. Usi	ng brainstorming and f	feedback met	hods in order to
		activat	e the accumulated expe	eriences of stu	idents By linking
		the ac	ademic subjects taken i	n the previou	s academic levels
		and lin	king them to the new or	es.	
	5 Providing students with practical skills by conducting				
		practic	al	- action billi	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
10. Course	e Structure	pruction			
Week	Hours	Required	Unit or subject name	Learning	Evaluation
	liouis	Learning	chie of subject hante	method	method
		Outcomes		memou	memou
		oucomes			

The first	2	The	Causes of electric	Lecture	1-Direct
		student	current injury		evaluation.
		must be			2-Exams
		able to			(written
		understand			+
		and solve			practical)
		scientific			
		problems			
		related to			
		the lesson			
The second	2	The	Types of electrical	Lecture	1-Direct
		student	injuries		evaluation.
		must be	_		2-Exams
		able to			(written +
		understand			practical)
		and solve			-
		scientific			
		problems			
		related to			
		the lesson			
The third	2	The	Relief for someone	Lecture	1-Direct
	_	student	injured by electrical		evaluation.
		must be	current - extricating		2-Exams
		able to	the injured person		(written +
		understand	the injuica person		nractical)
		and solve			practical)
		scientific			
		nrohloms			
		related to			
		the losson			
The fourth	2	The	Artificial regnization	Lootuno	1 Dimont
The fourth	4	1 lle student	Artificial respiration	Lecture	1-Direct
		student must bo	- treatment of burns		evaluation.
		must be			2-EXams
		able to			(written +
		understand			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
Fifth	2	The	Monthly exam	Lecture	1-Direct
		student			evaluation.
		must be			2-Exams
		able to			(written +
		understand			practical)
		and solve			
		scientific			
		nrohlame			
		problems			
		related to			
		related to the lesson			

I					
		student	from the passage of		evaluation.
		must be	electric current to		2-Exams
		able to	the ground		(written +
		understand			practical)
		and solve			_
		scientific			
		problems			
		related to			
		the lesson			
Seventh	2	The	Fire alarm systems -	Locturo	1_Direct
beventin	-	student	control unit	Lecture	Avaluation
		must bo	control unit		2 Exame
		able to			2-Exams
		able to			(written +
		understand			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
Eighth	2	The	Fire detectors - heat	Lecture	1-Direct
		student	detectors - smoke		evaluation.
		must be	detectors		2-Exams
		able to			(written +
		understand			practical)
		and solve			_
		scientific			
		problems			
		related to			
		the lesson			
Ninth	2	The	Buildings that must	Lecture	1-Direct
1 (IIIIII	-	student	be provided with a	Lecture	evaluation
		must bo	fire alarm system		2-Exame
		able to	ine alarin system		2-Exams
		understand			(written +
					practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
The tenth	2	The	Monthly exam	Lecture	1-Direct
		student			evaluation.
		must be			2-Exams
		able to			(written +
		understand			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
Eleventh	2	The	Audible alarms. bells	Lecture	1-Direct
	—	student	and horns		evaluation.

		1	1		1
		must be			2-Exams
		able to			(written +
		understand			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
Twelveth	2	The	Guidance on	Lecture	1-Direct
I werven	-	student	occupational health	Lecture	evaluation
		must bo	orcupational incatin		2-Exame
		able to	and safety		2-Exams
		able to			(written +
					practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
Thirteenth	2	The	Reducing unsafe	Lecture	1-Direct
		student	behavior and		evaluation.
		must be	practices		2-Exams
		able to			(written +
		understand			practical)
		and solve			-
		scientific			
		problems			
		related to			
		the lesson			
fourteenth	2	The	Personal protective	Lecture	1-Direct
1001000101	-	student	equipment - vision	Lociaro	evaluation
		must he	protection - hearing		2-Evams
		able to	protection - hearing		(writton +
		understand	protection		(written +
		and colvo			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
Fifteenth	2	The	Personal protective	Lecture	1-Direct
		student	clothing		evaluation.
		must be			2-Exams
		able to			(written +
		understand			practical)
		and solve			
		scientific			
		problems			
		related to			
		the lesson			
11. Course	e Evaluatio	n			
Distributing	the score	out of 100 acc	cording to the tasks assig	ned to the stu	dent such as daily
preparation	daily oral	monthly or w	itten exams, reports et		and show us during
rruminin,	July Oral,	,, , or wi		-	

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Occupational safety books
Main references (sources)	Books related to the topic of safety
	and accident prevention at work sites in the institute's library.
Recommended books and references (scientific	1- Books related to safety.
journals, reports)	2- General Civil Defense
	Magazine.
Electronic References, Websites	1- Signed by the Technical
	Institute/Rumaitha.
	2- General Civil Defense
	Department website.
	3- Websites of international
	companies.

13 Course N	Jame				
	vanie.		Digital Electronics		
14 Course C	ode.		Digital Electronics		
			RELEC1210		
15. Semester	r / Year		REELOIZIO		
			Annual		
16. Descripti	ion Pre	paration Date:			
			5/7/2021		
17. Available	e Atten	dance Forms:			
			Theoretical lectures		
18. Number	of Crec	lit Hours (Total) / Number of Units (Total)	
		x	60 annual hours	, 	
19. Course a	dminis	trator's name (r	nention all, if more than on	e name)	
Name:		· · · ·			
Email:					
20. Course C	Objectiv	ves			
Course Objecti	ves	1- Intr	oducing the student to th	e electronic	components that
		operate	e with a digital signal.		
		2- Intr	roducing the student to	the applic	ations of digital
		electro	nic components.		
		3- St	udy of different nu	imber syst	ems, numerical
		mather	natics.		- 1 f
		4- 1ea	ch the student now to co	nvert a signa	al from digital to
21 Tooching	r and L	Intear,	or from linear to digital.		
Stratogy	g and L		ng modorn moons to	prosont the	theoretical and
Strattegy		nractic	al aspects such as variou	s electronic	display devices to
		attract	students		display devices to
		Lookin	g and nulling the student	ts so that the	idea reaches the
		studen	t better.		
		2. Givi	ng students extra-curricu	ılar assignm	ents that require
		practic	ing skills and self-expla	anations usi	ing experimental
		metho	ls.		0
		3. Inte	errogating students thro	ough discus	sion sessions by
		asking	intellectual questions (h	now, why, w	hen, where, any
		specific	c topics).		
		4. Usin	g the method of brainsto	rming and f	eedback in order
		to act	ivate the accumulated	experiences	of students by
linking the study materials taken in the previous school					
stages and linking them to the new ones.					
22. Course Stru	ucture	D	T T 1 , T 1 , .	T	
Week Ho	urs	Required	Unit or subject name	Learning	Evaluation
		Learning		method	method
		Outcomes			

The first	2	The student must be able to understand and solve scientific problems related to the lesson	1 Number Systems 1.1 Analogue Versus Digital 1.2 Introduction to Number Systems 1.3 Decimal Number System 1.4 Binary Number System 1.4.1 Advantages 1.5 Octal Number System 1.6 Hexadecimal Number System 1.7 Number Systems – Some Common Terms 1.7.1 Binary Number System 1.7.2 Decimal Number System 1.7.3 Octal Number System 1.7.4 Hexadecimal	Lecture	1-Direct evaluation. 2-Exams (written + practical)
The second	2	The student must be able to understand and solve scientific problems related to the lesson	2 Binary Codes Binary Coded Decimal 2.1.1 BCD-to-Binary Conversion 2.1.2 Binary-to-BCD Conversion 2.1.3 Higher-Density BCD Encoding 2.1.4 Packed and Unpacked BCD Numbers 2.2 Excess-3 Code 2.3 Gray Code 2.3.1 Binary–Gray Code Conversion 2.3.2 Gray Code– Binary Conversion 2.3.3 Gray Code	Lecture	1-Direct evaluation. 2-Exams (written + practical)
The third	2	The student must be able to understand and solve scientific problems	3 Digital Arithmetic 3.1 Basic Rules of Binary Addition and Subtraction 3.2 Addition of Larger-Bit Binary Numbers 3.2.1 Addition Using	Lecture	1-Direct evaluation. 2-Exams (written + practical)

The fourth	2	related to the lesson	the 2's Complement Method 3.3 Subtraction of Larger-Bit Binary Numbers 3.3.1 Subtraction Using 2's Complement Arithmetic 3.4 BCD Addition and Subtraction in Excess- 3 Code 3.4.1 Addition 3.4.2 Subtraction 3.5 Binary Multiplication 3.5.1 Repeated Left- Shift and Add Algorithm 3.5.2 Repeated Add and Right-Shift Algorithm 3.6 Binary Division 3.6.1 Repeated Right- Shift and Subtract Algorithm 3.6.1 Repeated Right- Shift and Subtract Algorithm 4 Logic Gates and Related Devices 4.1 Positive and Negative Logic 4.2 Truth Table 4.3 Logic Gates 4.3.1 OR Gate 4.3.2 AND Gate 4.3.3 NOT Gate 4.3.4 EXCLUSIVE- OR Gate 4.3.5 NAND Gate 4.3.5 NAND Gate 4.3.6 NOR Gate 4.3.7 EXCLUSIVE- NOR Gate 4.3.8 INHIBIT Gate 4.3.8 INHIBIT Gate 4.4 Universal Gates	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Fifth	2	The	5-Logic Families	Lecture	1-Direct

		-	GA 400		• =
		must be	Significance and Types		2-Exams
		able to	5.1.1 Significance		(written +
		understand	5.1.2 Types of Logic		practical)
		and solve	Family		
		scientific	5.2 Characteristic		
		problems	Parameters 1		
		related to	5.3 Transistor		
		the lesson	Transistor Logic		
			(TTL)		
Sixth	2	The	6-Boolean Algebra and	Lecture	1-Direct
		student	Simplification		evaluation.
		must be	Techniques		2-Exams
		able to	6.1 Introduction to		(written +
		understand	Boolean Algebra 189		nractical)
		and solve	6 1 1 Variables		pructiculy
		scientific	L itarals and Tarms in		
		nrohloms	Booloon Expressions		
		problems	6 1 2 Equivalent and		
		related to	0.1.2 Equivalent and		
		the lesson	Complement of		
			Boolean Expressions		
			6.1.3 Dual of a Boolean		
			Expression		
			6.2 Postulates of		
			Boolean Algebra		
			6.3 Theorems of		
			Boolean Algebra		
Seventh	2	The	7-Arithmetic Circuits	Lecture	1-Direct
		student	7.1 Combinational		evaluation.
		must be	Circuits		2-Exams
		able to	7.2 Implementing		(written +
		understand	Combinational Logic		practical)
		and solve	7.3 Arithmetic		-
		scientific	Circuits – Basic		
		problems	Building Blocks		
		related to	7.3.1 Half-Adder		
		the lesson	7.3.2 Full Adder		
			7.3.3 Half-Subtractor		
			7 3 4 Full Subtractor		
			7.3.5 Controlled		
			Invertor		
			7.4 Adden Subtractor		
			7.4 Adder–Subtractor		
Fiab4b		The	A Nultiplanara	T	1 Direct
Eighth	2	I ne	o-iviniplexers and	Lecture	1-Direct
		stuaent	Demuluplexers		evaluation.
		must be	8.1 Multiplexer		2-Exams
		able to	8.1.1 Inside the		(written +
		understand	Multiplexer		practical)
		and solve	8.1.2 Implementing		
		scientific	Boolean Functions		
		problems	with		
		related to	Multiplexers		

					,
		the lesson	8.1.3 Multiplexers for		
			Parallel-to-Serial Data		
			Conversion		
			8.1.4 Cascading		
			Multiplexer Circuits		
			280		
			8.2 Encoders		
			8.2.1 Priority Encoder		
			8 3 Demultiplexers		
			and Decoders		
			8 3 1 Implementing		
			Booloon Functions		
			with Decodors		
			With Decouers		
			8.3.2 Cascading		
N.T. (N			Decoder Circuits	—	1.51
Ninth	2	The	9-Programmable	Lecture	1-Direct
		student	Logic Devices		evaluation.
		must be	Fixed Logic Versus		2-Exams
		able to	Programmable Logic		(written +
		understand	9.1.1 Advantages and		practical)
		and solve	Disadvantages		
		scientific	9.2 Programmable		
		problems	Logic Devices – An		
		related to	Overview		
		the lesson			
The tenth	2	The	10-Flip-Flops and	Lecture	1-Direct
		student	Related Devices		evaluation.
		must be	10.1 Multivibrator		2-Exams
		able to	10 1 1 Bistable		(written +
		understand	Multivibrator		nractical)
		and solve	10.1.2 Schmitt Trigger		practical
		soiontifio	10.1.2 Schintt Higger		
		nnohloma	Multivibrotor		
		problems			
		related to			
		the lesson	Multivibrator		
			10.2 Integrated Circuit		
			(IC) Multivibrators		
			10.2.1 Digital IC-		
			Based Monostable		
			Multivibrator		
			10.2.2 IC Timer-Based		
			Multivibrators		
			10.3 R-S Flip-Flop		
			10.3.1 R-S Flip-Flop		
			with Active LOW		
			Inputs		
			10.3.2 R-S Flip-Flop		
			with Active HIGH		
			Innuts		
			10.2.2 Clocked D.S.		
			IU.J.J CIOCKEU K-S		

Eleventh	2	The student must be able to understand and solve scientific problems related to the lesson	10.7.1 J-K Flip-Flop as D Flip-Flop 10.7.2 D Latch 10.8 Synchronous and Asynchronous Inputs 10.9 Flip-Flop Timing Parameters	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Twelveth	2	The student must be able to understand and solve scientific problems related to the lesson	12-Counters and Registers 11.1 Ripple (Asynchronous) Counter 11.1.1 Propagatio کال الاء Delay in Ripple Counters 11.2 Synchronous Counter 11.3 Modulus of a Counter 11.4 Binary Ripple Counter – Operational Basics 11.4.1 Binary Ripple Counters with a Modulus of Less than 2N 11.4.2 Ripple Counters in IC Form	Lecture	1-Direct evaluation. 2-Exams (written + practical)
Thirteenth	2	The student must be able to understand and solve scientific problems related to the lesson	13-Counters and RegistersSynchronous (or Parallel) Counters11.6 UP/DOWN Counters11.7 Decade and BCD Counters11.8Presettable Counters	Lecture	1-Direct evaluation. 2-Exams (written + practical)
fourteenth	2	The student must be able to understand and solve scientific problems related to the lesson	14-Data Conversion Circuits – D/A and A/D Converters 12.1 Digital-to- Analogue Converters 12.1.1 Simple Resistive Divider Network for D/A Conversion 12.1.2 Binary Ladder Network for D/A	Lecture	1-Direct evaluation. 2-Exams (written + practical)

Fifteenth	2	The student must be able to understand and solve scientific problems related to the lesson	Conversion 12.2 D/A Conver Specifications 12.2.1 Resolution 12.2.2 Accuracy 12.2.3 Conversion Speed or Settling 12.2.4 Dynamic 15-Data Convers Circuits – D/A at A/D Converters Types of D/A Converter 12.3.1 Multiplyin Converters 12.3.2 Bipolar-O D/A Converters 12.3.3 Compand D/A Converters Types of Converters	rter n on g Time <u>Range</u> sion nd ng D/A output ing A/D verter	Lecture	1-Direct evaluation. 2-Exams (written + practical)
23. Course Evaluation						
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc 24. Learning and Teaching Resources						
Required textbooks (curricular books, if any)				Academic lectures		
Main references (sources)				References related to the material in the institute's library		
Recommended books and references (scientific journals, reports)				Scientific books and journals related to the subject of digital electronics: Basics, instructions, applications.		
Electronic References, Websites				The Institute's website, various Internet sources, websites of international companies		