Ministry of Higher Education and Scientific Research

Scientific Supervision and Evaluation Agency

Department of Quality Assurance and Academic Accreditation

Academic program description for colleges and institutes

University: Al-Furat Al-Awsat Technical University

College/ Institute Technical Institute Samawa

Scientific Department : Electrical Technologies.

Date of filling out the file 22/4/2024

The signature :

Name of Department Head:A.L. Nidhal Abd Mohammed

Date: 22/4/2024

The signature :

Name of scientific assistant:- L. Alaa Abd Ali Hadi

Date: 22/4/2024

The file was checked by A. L. Ahmed Abdel Mohsen Abdel Sahib

Division of Quality Assurance and University Performance

Name of the Director of the Quality Assurance and University Performance

Division: A.L. Ahmed Abdel Mohsen

Date: Signing 22/4/2024

Authentication of the Dean

Academic program description form for colleges and institutes

Description of the academic program

This academic program description provides a summary of the most important characteristics of the program and the learning outcomes that the student is expected to achieve, demonstrating whether he or she has t is accompanied by a made the most of the opportunities available. I description of each course within the program

Samawa -Technical Institute	1. Educational institution
Electrical technologies	2. Scientific department/center
Electrical Power Branch	3. Name of the academic or professional program
Technical Diploma	4. Name of the final certificate
annual	5. :School system Annual/courses/others
	6. Accredited accreditation program
There is a close relationship with the labor market that receives our graduates	7. Other external influences
1994-1993	8. The year of reception of the first regiment
2024/20/4	9. Date the description was prepared
10.Objectives of the academic program	
The department aims to prepare and graduate qualified technical personnel to carry out the work of operating and maintaining electrical units in	
Generation stations, transmission and distribution of electrical energy, and .maintenance of protection and control devices for the electrical energy system	

11.Required program outcomes and teaching, learning and evaluation methods

أ- Cognitive goals

.The student has the ability to think and solve problems and electrical circuits -A1

.The ability to analyze and think scientifically by applying laws -A2

The ability to speak and write in a scientific manner in Arabic and English -A3

ientifically investigate aspects of electrical circuitsThe ability to sc -A4

Adherence to professional ethics and the ability to demonstrate professional competence -A5

The program's skill objectives -B

Application skill for electrical circuits -B1

Repair skill -B2

The skill of diagnosing, solving problems, and proposing alternatives -B3

Teaching and learning methods

- Lectures in modern and traditional methods + laboratories (weekly reports on each experiment carried out) + field visits + summer training
- Library activities and connection to the international information network (the Internet) to obtain additional knowledge of academic subjects
- Practical laboratories are monitored by the subject teacher and the department's technical staff
- Through discussion, students participate in solving some practical problems

Evaluation methods

- Students are evaluated individually by giving an opportunity to participate in the class by answering questions
- Students are evaluated collectively through daily examinations with practical and theoretical questions
- Students are evaluated collectively by giving extracurricular assignments, such as laboratories writing special reports or those related to practical experiments in
- End of the first semester and second semester exams, and final exams for the first and second semester

.Emotional and value goals -C

Encouraging the development of students' professional and technical thinking -C1

Applied skills within laboratories and laboratories -C2

Expanding the cognitive horizon and using brainstorming to generate ideas -C3

Developing Internet research skills -C4

Teaching and learning methods

- Using modern means to present the theoretical and practical aspects, such as various electronic display devices, to attract attention and attract students so that

.the idea reaches the student better

- -the use of skills and self Giving students extracurricular assignments that require explanations in experimental ways
- Questioning students through discussion sessions by asking intellectual questions .how, why, when, where, which) about specific topics)
- activate the Using the method of brainstorming and feedback in order to accumulated experiences of students by linking the study materials that were .taken in the previous academic stages and linking them to the new ones
- Providing students with practical skills by conducting practical experiments on .uipmentlaboratory eq

Evaluation methods

:The evaluation is done on the basis of

1- (year) exam (usually 10% practical + 10% theoretical-First semester (mid
2- (Second semester exam (usually 10% practical + 10% theoretical
3- Work the year (10%), participation and regular attendance are taken into consideration
4- .(Final exam (10% practical + 40% theoretical

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

Work in the field of maintenance and repair of engines and electrical equipment -D1
Work in the field of maintenance and repair of electrical control devices -D2
The tendency to cooperate and teamwork -D3
itingPossessing linguistic skills in speaking and wr -D4

Teaching and learning methods

- Summer and home activities
- Preparing and implementing laboratory reports by students
- Develop and update the subject vocabulary to keep pace with developments

Evaluation methods

- Written + semester exams + final exams + daily evaluation
- taking notes
- Writing and submitting reports
- .Scientific discussions

electrical circuits -The first stage

12.Program structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Editorial + practical	Lectures + practical	The system of units used in electricity and the units of measurement for each substance (its parts and multiples). .Mathematical applications for converting values using units -Definition of the basic units of voltage, current, and resistance factors -Ohm's law -f the electrical circuit components o specific resistance of -affecting the value of resistance .conductive and insulating materials	Theoretical + practical	4	the first
Editorial + practical	+ Lectures practical	:DC circuits include 1. -Connecting resistors in series with examples 2 Connecting resistors in parallel with examples Mixed connection of resistors with examples -3 2.) Star and triangle connectionY /Δof resistors and (conversion from each to the other with examples	Theoretical + practical	4	the second
Editorial + practical	Lectures + practical	Applications to series, parallel, and mixed connection circuits Starburst and triangle ducks	Theoretical + practical	4	the third
Editorial + practical	Lectures + practical	أ. Definition of Kirchhoff's laws for -Kirchhoff's Laws current and voltage, with answers to questions ب. Maxwell with solutions examples	Theoretical + practical	4	the fourth
Editorial + practical	Lectures + practical	Applications of Thevenin and Norton theorem	Theoretical + practical	4	VI
Editorial + practical	Lectures + practical		Theoretical + practical	4	
Editorial + practical	Lectures + practical	steps to apply it -definition of the theory -Congruence theory in solving direct current circuits that contain more than one solving examples -source Definition of the current source and the voltage source rt from one to continuous power distributor) and how to conve) The theory of transferring the greatest possible -the other Definition of the theory and derivation of its -power	Theoretical + practical	4	Seventh

		Practical examples -relationships			
Editorial + practical	Lectures + practical	their definition, properties of -Alternating quantities, including how to generate alternating current, its -alternating current definition of the effective -wave diagram, and its relationships) valueRMS to and the average value and their relationships (find the formation factor and value factor for irregular .waveforms with applied examples	Theoretical + practical	4	VIII
Editorial + practical	Lectures + practical	their phase and -their definition -Alternating vector quantities -phase angle and how to find it -directional representation finding the resultant of vector quantities, including with applied -multiplication, division, addition and subtraction sexample	Theoretical + practical	4	Ninth
Editorial + practical	Lectures + practical	Study the effect of alternating current on a circuit containing a -only resistance, a circuit containing only pure inductance finding the phase -circuit containing only pure capacitance angle between voltage and current for each circuit and solving lesexamp	Theoretical + practical	4	The tenth
Editorial + practical	Lectures + practical	The effect of alternating current on a circuit containing A circuit containing -resistance and inductance in series A circuit containing -resistance and capacitance in series Finding the -resistance, inductance and capacitance in series -ween current and voltage in the three cases relationship bet Total impedance of the circuit with applied -Phase angle examples	Theoretical + practical	4	eleventh
Editorial + practical	Lectures + practical	The effect of alternating current on a circuit containing a circuit containing -resistance and inductance in parallel a circuit containing -resistance and capacitance in parallel finding the -resistance, inductance and capacitance in parallel -ip between current and voltage in the three cases relationsh finding -its definition and how to find it -phase angle permittivity with... Practical examples -impedance	Theoretical + practical	4	twelveth
Editorial + ticalprac	Lectures + practical	) 7-Use Description 1J-Operator or the complex factor to find (the total impedance, total permittivity, current, voltage, and phase angle for circuits connecting impedances in series and .parallel, and solve examples	Theoretical + practical	4	Thirteenth
Editorial + practical	Lectures + practical	defining -series resonance circuit -Resonant circuits include calculating current, -the state of resonance and how to reach it finding -voltage, impedance, and frequency angle at resonance and drawing the -finding the quality factor -the beam width elationship between inductive reactance and capacitive r solving examples -reactance with frequency	Theoretical + practical	4	fourteenth
Editorial + practical	Lectures + practical	calculating current, -its definition -Parallel resonance circuit voltage, impedance, angle of impedance, phase angle, and drawing -finding the beam width -resonance frequency finding the quality -graphical relationships with frequency examples solving -factor	Theoretical + practical	4	Fifteenth
Editorial + practical	Lectures + practical	Applying theories such as Norton's theorem, Thevenin's theorem, and congruence to alternating current circuits and solving examples	Theoretical + practical	4	sixteen
Editorial + practical	Lectures + practical	Power in alternating current circuits includes calculating power circuits containing only -circuits containing resistance only -in circuit -circuits containing only capacitance -inductance d containing resistance, inductance, and capacitance in series an -definition of active power and how to calculate it -parallel passive power and how to calculate it	Theoretical + practical	4	seventeenth
Editorial + practical	Lectures + practical	how to draw a power -Total apparent power (its definition) its definition and its effect on -power factor -triangle -how to improve power factor -alternating current circuits with applied examples	Theoretical + practical	4	eighteen
Editorial + practical	Lectures + practical	The theory of transmitting the greatest possible power in with -derivation of its relations -alternating current circuits examples	Theoretical + practical	4	nineteenth
Editorial + practical	Lectures + practical	Practical methods for measuring resistors of high, medium and the -using an ohmmeter in series and parallel -small values -the compensation method -ammeter and voltmeter method the -the voltage divider method -using a Wheatstone bridge .with examples of each method -od switching meth	Theoretical + practical	4	The twentieth
Editorial + practical	Lectures + practical	its definition and how -phase alternating current circuits -Three three -two phases -one phase -to generate alternating current with a drawing of each circuit, star and triangle -phases phase alternating current circuits, and -connections in three	Theoretical + practical	4	st21

		al relationships for calculating line and phase current and speci features -phase power -voltage, total power and line capacity Each connection when used in balanced and unbalanced loads, with an example solution			
Editorial + practical	Lectures + practical	phase alternating current, -Solving applied examples of three triangular and star connections with balanced and unbalanced .loads	Theoretical + practical	4	twenty tow
Editorial + practical	Lectures + practical	a -phase loads -Methods for measuring power for three wattmeter, how to connect it to a circuit to measure active and calculate inactive power and apparent power with -power an example solution how to find -Measuring power using a wattmeter and a voltage the total power in this way, and in the case of star and triangle using three wattmeters -using two wattmeters -connections	Theoretical + practical	4	twenty third
Editorial + practical	Lectures + practical	ction to North and an introdu -the magnetic circuit -Magnetism the basic -types of magnetic materials -South Pole magnetism characteristics of magnetic materials and their definition, magnetic driving -magnetic flux -including the magnetic field ect magnetic magnetic flux density and factors that aff -force magnetic circuits and -permeability and its effect -flux application of Kirchhoff's laws on her	Theoretical + practical	4	twenty fourth
Editorial + practical	Lectures + practical	Solve applied examples of magnetism	Theoretical + practical	4	th25
Editorial + practical	Lectures + practical	its -inductance of the coil (electromagnetic induction) -Self inductance of the -special relations to find the self -definition and relations to -mutual inductance between two coils -coil find the mutual inductance, depending on the type of the two coils, which includes: mutual and inverse connection of .series connection	Theoretical + practical	4	-twenty sixth
Editorial + practical	Lectures + practical	Curves of growth and decay of current from an inductive direct explanation of this circuit and its effect on -circuit the general relationship of growth and decay of -current drawing the current and calculating the time -current in a coil solving examples -constant Charging and discharging capacitors, including the use of capacitors in direct current circuits. The general relationship for -charging and discharging a capacitor and drawing the current solving -the effect of the time constant with its calculation .plesexam	Theoretical + practical	4	th27
Editorial + practical	+ Lectures practical	-types of measuring devices -Measuring devices include its -moving coil measuring devices -nature of their work installation and use in measuring voltage and current, mentioning its advantages and disadvantages, and a drawing of .the device	Theoretical + practical	4	-Twenty eighth
Editorial + practical	Lectures + practical	its installation and how to use -core measuring device -The iron its advantages and disadvantages and drawing -it in measuring the device's diagram	Theoretical + practical	4	XXIX
Editorial + practical	Lectures + practical	drawing a -its installation -Wattmeter measuring devices its arrangement in the electrical circuit -diagram of the device -its advantages -moment equations -for measuring power drawing of the device -the oscilloscope device -disadvantages how to operate and use it -tallation its ins -	Theoretical + practical	4	thirty

10. Infrastructure	
Circuits and measurements	Required prescribed books -1
Fundamental of Electrical Circuits/David A.Bell	(Main references (sources -2
Electric circuits /Joseph A. Edminister Introductory circuits analysis / Robert Boylestad	Recommended books and references (scientific journals, (...،reports
Various internet sources	Electronic references, -B ...Internet sites

13. Admission standard (establishing regulations related to admission to the college or (institute
14. Course development plan
1- Follow the latest publications on websites and public libraries 2- .Access to the latest devices and technologies in the field of work 3- Participation in various courses related to the subject 4- See the latest findings of modern technology in this article 5- Preparing courses that develop the capabilities of laboratory trainers so that they can train students more efficiently 6- ies with modern equipment that keeps pace with scientific Providing laborator development in developed countries

Institutions electrical

It will be The student Able On Getting to know On Materials Electrical And organize Wiring used In The worker

And homes And establishment And it is accusative The places Electrical Ways Control And protection For loads different

By establishment

Awsat University - Samawa -Technical Institute	.10The institution Educational
Technologies Electrical Class The first	.11Section Scientific / The center
Institutions Electrical	.12Name / Symbol The decision
Section	.13Programs Which He enters In it
Attendance Mandatory Daily	.14Forms Attendance available
Academic year 2023/2024	.15Chapter / Year
2Look2 +weeks * 4 = 120 hours per 30 = My work year	.16Number Hours Academic (total)
2024/20/4	.17Date Preparation This Description
	.18Objectives The decision
The goal :Year Definition The student On Systems Institutions Electrical .different	
The goal :Private It will be The student Able On Getting to know On Materials Electrical And organize Wiring used In The worker And homes And establishment And it is accusative The places Electrical Ways Control And protection For loads different .By establishment	

It will be The student Able On Knowledge Process By institutions Electrical (lighting) Addition To How Establishment And it is accusative The places .Electrical

.12Outputs The decision Ways Education And learning And evaluation

A Objectives Knowledge

A1Definition The student On Systems Institutions Electrical different

A2Definition The student On Materials Electrical

A3Definition The student On Systems Wiring used In The worker And homes

A4Definition The student On Ways Establishment And it is accusative The places Electrical

A5Definition The student On Ways Control And protection For loads different By establishment

A6Training The student Practically By institutions Electrical (lighting) Addition To How Establishment And it is accusative The places .Electrical

ب Objectives skills Private .By decision

ب1 Action Experiments The process Which Check The side Theoretical

ب2- Acquisition Skill In Institutions Electrical different

ب3- Acquisition Skill Wiring used In The worker And homes

ب4Acquisition Skill Establishment And it is accusative The places Electrical

ب5Acquisition Skill Design And implementation Ways Control And protection For loads different By establishment

Ways Education And learning

Lectures Theory + Experiment Laboratory + Use And touch Device Measurement + Movies Scientific

Ways Evaluation

Editorial + My work + Oral + Discussion

C Objectives Existentialism And value

C1Must My house Exercises) (Student

C2Lectures Theory

C3Skills Application Inside The laboratory

C4Discussion Inside Class

Ways Education And learning

Lectures + My work + Movies Scientific + Discussion

Ways Evaluation

Editorial + My work + Oral + Discussion

 Skills Public And qualification movable) Skills The other related Capable Employment And development Personal .(

1Skills Application Inside The worker And workshops And laboratories

2Movies Scientific

3Visits Scientific

4Skills Design And implementation Ways Control And protection For loads different By establishment

5Skills In Institutions Electrical different

6- Skills Wiring used In The worker And homes

7Skills Establishment And it is accusative The places Electrical

.13 structure The decision

A way Evaluation	Education A way	Name The unit / Or The topic	Outputs Learning required	Hours	The week
Editorial + My work	Lectures + My work	Look General On Vocabulary The approach For the material And the sources Scientific From A book Methodology And help Classification Materials To : Materials Electrical Connector Conductors Something like it Connectors Semiconductors InsulatorsInsulators	Look + My work	4	The first
Editorial + My work	Lectures + My work	Principles Electricity Team Effort ، Severity The current ، Severity The current The electrician (ampere) ، Factors Influential In Severity electric Resistance ، current Factors Influential On .Resistance Components The circle Electrical Source ، Types The outlet Electrical Sockets، Wires And its types ، Loads Electrical In all Its types The keys And its types And rates ،protection Funds Connectivity Lamps Electrical And its types and its uses	Look + My work	4	The second
Editorial + My work	Lectures + My work	Materials Electrical .Connector CopperCupper- Properties Electrical For copper - Properties Mechanical For copper AluminumAluminumProperties Electrical For aluminium - Properties Mechanical For aluminium Their features and their uses In Field Electricity Alloys High Resistance - Properties Which Make it happen From herElements Good In Uses Electrical	Look + My work	4	Third
Editorial + My work	Lectures + My work	Materials Buffer Examples On Materials Buffer - Air ، The oil Its characteristics and its uses Special Materials Buffer In proportion To Carry it To degrees Heat Materials Buffer Solid Cotton) ، Paper ، Asbestos ، TextileGlass ، Tissues And movies Industrial ، Mica ، Materials (other ، permissibilitypermittivity) Steady Isolation (Laws Examples Solved	Look + My work	4	Fourth
Editorial + My work	Lectures + My work	Properties Magnetism For materials Power Magnetism ، Types Materials Magnetism ، Terms Accompaniment For her - Properties Magnetism - Laws By magnetism related Examples Solved	Look + My work	4	Fifth
Editorial + My work	Lectures + My work	Circles Magnetism Application Laws Kirchhoff .On her Examples Solved On Magnetism	Look + My work	4	Sixth
Editorial + My work	Lectures + My work	Properties Mechanical For materials Electrical The tension Stress ، Elongation ، Flexibility ، Other Examples Solved	Look + My work	4	Seventh
Editorial + My work	Lectures + My work	The stages Which It passes With it Energy Electrical Generation Energy Electrical) Overview Brief About Types Stations Obstetrics (Transfer Energy Electrical Regulations) used ، Advantages (And defects Stations Secondary school The crane And the	Look + My work	4	Eighth

		low one And their prices Distribution Energy Electrical Regulations) used (Differently Its types			
Editorial + My work	Lectures + My work	Principles Primary About How Equipment The consumer From Station Secondary And materials necessary Therefore And a type The consumer Plates Distribution household And industrial Installation) (and connect How Nutrition Building Big By electricity With Example Therefore Price Transformers Electrical used(KVA)And locations Use itIn The network Electrical Plans Examples Solved	Look + My work	4	Ninth
Editorial + My work	Lectures + My work	Types The keys used In Institutions Electrical And its importance The key Traditional(Toggle Switch)) Single ‹pole The ‹Two ways ‹middle Binary ‹pole Triple (pole The key Compressor(Push button switch)	Look + My work	4	Tenth

		Other From) used (recently Drawing Circles Electric Contains On This The keys In Circles Complete			
Editorial + My work	Lectures + My work	Devices Protection used In Institutions Electrical (fuses) Or Commas(Fuses) Definition The fuse) ، The current The law ، A stream The month ، Factor Fusion ، The current Expected And a stream The piece ، Time The month ، Time Permanence The arc The electrician Time Operation Total (Types Fuses With Advantages And defects All From her ، How Choose The separator Coordination Between Commas In Same The department Electrical	Look + My work	4	st1 Ten
Editorial + My work	Lectures + My work	Sections The course The small one(Miniature Circuit Breaker) MCBInstallation And keep you entertained Conclusively The course The Leakage Ground(Earth leakage circuit breaker) ELCBInstallation And theory Work How Distribution Loads Inside The building From During Panel Distribution used And an account Price The cutter With Principle His work(Magnetic and Thermal Circuit Breakers) Sections Thermal And magnetism - Sections The courseCircuit Breakers With Install it And a principle His work (Magnetic Circuit Breakers) Sections Magnetism	Look + My work	4	The second Ten
Editorial + My work	Lectures + My work	Systems Wiring The electricianElectrical Wiring Systems System Connectors Others IsolatedBB، System Packing Rubber The strongTRS System Connectors Isolated With(PVC)، System Connectors Isolated With(PCP)، System Wiring Inside Pipes Plastic And the number necessary Therefore ، Numbering Wires And cables In Work ، Consider Colors Wires When Establishment	Look + My work	4	Third Ten
Editorial + My work	Lectures + My work	Institutions Electrical household Types Institutions Electrical household Advantages And defects All From her ، Conditions Security ، Cost ، Durability required And the appearance And the shape The year To establish - Tools used In Institutions household Establishment The worker And workshops And an account Cost	Look + My work	4	Fourth Ten

Editorial + My work	Lectures + My work	GroundingGrounding Components GroundingGrounding Components) Soil The landEarthAnd resist itEarth resistanceAnd the resistance Quality For landEarth Resistivity، Electrodes GroundingGrounding Electrode، Equipment The connection And connectivity(Bonding Roads different To reduce Resistance GroundingReduce Resistance Grounding Devices And equipment Duty Ground it Devices must be grounding Importance Grounding The goodThe Importance of Grounding The team Between The system The ground And not The ground ، Ways MeasurementGrounding Measurering	Look + My work	4	Fifth Ten
Editorial + My work	Lectures + My work	It is forbidden Lightning strikesLighting Rod The thunderbolt ، Importance It is forbidden Lightning strikes ، Components It is forbidden Lightning strikes Things The task When Design It is forbidden Lightning strikes Equipment And structures Which Must Protect her From Lightning strikes	Look + My work	4	Sixth Ten
Editorial + My work	Lectures + My work	Trauma Electrical Definition And its reasons And a relationship Quantity Team Effort And the current In shock And a path The current And severity The current Mar With the body ، Time Pass ،current Reasons Trauma Electrical The rules Public For safety From Trauma And procedures After Trauma Factors Which It depends On her Impact The current The electrician In The body Procedures Preventive Which It is possible Take it For protection From Risks Electrical	Look + My work	4	Seventh Ten
Editorial +	Lectures	Protection From A stream Leakage The patient	Look +	4	Eighth

.14Structure Infrastructure	
Obligatory Institutions Electrical	1- Books The decision required
Project A book Institutions Electrical	2- References Home (Sources)
Electrical installation technology (by Thompson) Electrical installation technology (by Michael Needle) Practice on low voltage switch gears (by Siemense Publication)	A Books And references Which Recommended With it) Magazines Scientific , Reports ....,(
Source The Internet different	ب - References ،electronic Locations The Internet

.15Plan Development The decision Academic
5 Participation In Courses different Private By substance 6 Informing On Another What I arrived For him Technology Modern In This Article 7 Preparation Courses Which Develop Capability Trainers In The laboratory They can't From Training The request In a picture Efficient 8 Increase Laboratories With devices Modern Which Keep up Development Scientific In Countries Advanced

Course description form

Electronic

It will be The student Able On The knowledge : With ingredients Electronic Manufacturer From It's like Connectors Differently Its types - Install it -

Its characteristics - Its uses In Circles Electronic - Its applications - Analysis Circles Electronic Private With it With ingredients Electronic

Photovoltaic And its applications

Awsat University - Samawa -Technical Institute	.19The institution Educational
Technologies Electrical Class The first	.20Section Scientific / The center
Electronic	.21Name / Symbol The decision
Section	.22Programs Which He enters In it
Attendance Mandatory Daily	.23Forms Attendance available
Academic year 2023/2024	.24Chapter / Year

2Look2 +My work =4*30A week =120An hour Annually	.25Number Hours Academic (total)
2024/20/4	.26Date Preparation This Description
	.27Objectives The decision
The goal :Year Definition The student With ingredients Electronic .different	
The goal :Private It will be The student Able On The knowledge : With ingredients Electronic Manufacturer From It's like Connectors Differently Its types - Install it - Its characteristics - Its uses In Circles Electronic - Its applications - Analysis Circles Electronic Private With it With ingredients Electronic Photovoltaic .And its applications	
It will be The student Able On :That .1It works Devices Electronic Basic existing In The laboratory .2Connects The elements Electronic In Circles Electronic Simple .3Knowledge Specifications And features Private By piece Electronic .4Getting to know On Circles Application For some Components And implement it	

.16Outputs The decision Ways Education And learning And evaluation

A Objectives Knowledge

A1Definition The student With ingredients Electronic different
A2Definition The student On Components Electronic Manufacturer From It's like Connectors Differently Its types
A3Definition The student On Use Components Electronic In Circles Electronic
A4Definition The student On Analysis Circles Electronic And its applications
A5Definition The student On Devices Electronic Basic existing In The laboratory
A6Training The student On Connect The elements Electronic In Circles Electronic Simple
A7Definition The student On Specifications And features Private By piece Electronic
A8Definition The student On Circles Application For some Components And implement it

ب - Objectives skills Private .By decision

ب1- Action Experiments The process Which Check The side Theoretical
ب2- Acquisition Skill Use Components Electronic In Circles Electronic
ب3- Acquisition Skill Analysis Circles Electronic And its applications
ب4Acquisition Skill Connect The elements Electronic In Circles Electronic Simple
ب5Acquisition Skill Design Circles Application For some Components And implement it

Ways Education And learning

Lectures Theory + Experiment Laboratory + Use And touch Device Measurement + Movies Scientific

Ways Evaluation

Editorial + My work + Oral + Discussion + Reports Weekly

C Objectives Existentialism And value

C1Must My house Exercises) (Student
C2Lectures Theory
C3Skills Application Inside The laboratory
C4Discussion Inside Class

Ways Education And learning

Lectures + My work + Movies Scientific + Discussion + Reports Weekly

Ways Evaluation

Editorial + My work + Oral + Discussion

 - Skills Public And qualification movable) Skills The other related Capable Employment And development Personal .(

- 1Skills Application Inside The worker And workshops And laboratories
- 2Movies Scientific
- 3Visits Scientific
- 4Skills Use Components Electronic In Circles Electronic
- 5Skills In Analysis Circles Electronic And its applications
- 6- Skills Connect The elements Electronic In Circles Electronic Simple
- 7Skills Design Circles Application For some Components And implement it
- 8Skills Action Experiments The process Which Check The side Theoretical

.17Structure The decision

A way Evaluation	A way Education	Name The unit / Or The topic	Outputs Learning required	Hours	The week
Editorial + My work Execute) Experience (report +	Lecturer + My work	Theory It's like Connectors - Installation Atomic - Levels Energy - Crystals - Connectivity In Crystals - A stream The gap - How Move Gaps	Look + My work	4	The first
Editorial + My work	Lectures + My work	Vaccination - Crystal Necessary Type(P)Crystal Negative From Type(N)A stream Electrons And a stream Gaps - Resistance Total	Look + My work	4	The second
Editorial + My work Execute) Experience (report +	Lecturer + My work	Binaries It's like Connectors - Link(PN)Formation Area Evacuation - Effort The checkpoint - Tel Energy - Effects Thermal - The binary biased - Bias The front - Bias The reverse - Curves Properties In The two directions The front And the opposite - A stream Transit The fleeting - A stream Pregnant women Minority - A stream Leakage Surface - Effort Fraction - Effort The end (PIV)The greatest A stream In front of me - The greatest Effort Reverse -(PIVmax)- The department Reward For the duo	Look + My work	4	Third & Fourth
Editorial + My work Execute) Experience (report +	Lecturer + My work	The binary As a unit To stream - Unified Half The wave - Value Continuous To stream And calculate it - Value Effective He hesitated Exit	Look + My work	4	Fifth
Editorial + My work Execute) Experience (report +	Lecturer + My work	Unification The wave Complete - Using Converted Branching The middle one - Unified Qantari-Al - Account Values Continuous And effective To stream - Extract He hesitated Exit - Compare Between Unified Half The wave And unified The wave Complete - Compare Between Units The wave Complete	Look + My work	4	Sixth
Editorial + My work Execute) Experience (report +	My work Lecturer +	(RC)- Effort Exit Continuous Waves Filters - Filtering Using Expansive - Filter(LC) Filter	Look + My work	4	Seventh
Editorial + My work Execute) Experience (report +	My work Lecturer +	The negative - Pruning The compound Worker Waves Double Effort Circles Pruning - Pruning The obligation - Pruning	Look + My work	4	Eighth
Editorial + My work Execute) Experience (report +	Lecturer + My work	Binary The zener - Install it - Ramzan - Its characteristics - Fraction The final one Brokenness The zener - Effort Fraction - Carry Capacity - Objection The zener - Effects Degree Heat - Report The zener Organizing Effort Continuous	Look + My work	4	109
Editorial + My work Execute) Experience (report +	Lecturer + My work	transistor Binary Polarity - Install it - His areas - Symbol - Efforts Bias -(□ dc)-(□ dc)The relationship Between(□ dc)-(□ dc)Types Bias - Formula Connecting Report In transistor And the department	Look + My work	4	1211

Editorial + My work Execute) Experience (report +	My work Lecturer +	(ICEO)- Curved Earn The current - The relationship Between(IC)And(ICEO) Curves Special transistor - Areas Work Definition(ICBO)And	Look + My work	4	Third Ten
Editorial + My work Execute) Experience (report +	Lecturer + My work	Circles Bias transistor - Bias Al Qaeda - Bias The emitter	Look + My work	4	Fourth Ten
Editorial + My work Execute)	My work Lecturer +	Divided Effort - Example Application Bias The mosque - Bias Self - Bias Nutrition Background - Bias	Look + My work	4	1615

Experienc e (report + Editorial + My work Execute) Experienc e (report +	Lecturer + My work	The circle Reward Continuous For transistor - Line Pregnancy Continuous	Look + My work	4	17
Editorial + My work Execute) Experienc e (report +	Lecturer + My work	Points Work - Point Residence(Q-Point)Example Application	Look + My work	4	18
Editorial + My work Execute) Experienc e (report +	Lecturer + My work	transistor In Zoom in Indications The small one - The circle Reward alternating - Report The ideal - Constants Hybrid - The circle Reward Using Transactions(h)- Earn Effort - Earn The current - Earn Capacity - Resistance Income And the exit - Magnifiers The signal The small one - Market Al Qaeda - Market The emitter	Look + My work	4	2019 21
Editorial + My work Execute) Experienc e (report +	Lecturer + My work	Use transistor In Organizing Effort - Organized Next - Organized Parallel Circle Source Effort Ongoing	Look + My work	4	22
Editorial + My work Execute) Experienc e (report +	Lecturer + My work	transistor Impact The field Wasali-Al(JEFT)- Install it - Symbol - Theory Work - Curves Properties - Curved Conductivity exchange - Definition Effort The narrowness(V_{GSoff}) ،(I_{DSS}) ،(V_P)- Curves Special (MOSFET)-(D-MOSFET)-(E-MOSFET)	Look + My work	4	24 23
Editorial + My work Execute) Experienc e (report +	Lecturer + My work	Circles Bias(FET)- Bias Source The current Fixed - Point Work Bias Self - The circle Reward No(FET)Use(FET) In Zoom in The signal The small one	Look + My work	4	26 25
Editorial + My work Execute) Experienc e (report +	Lecturer + My work	Compare Between Types TheFET) (FET)،(MOSFETAnd between(B.J.T)	Look + My work	4	27
Editorial + My work Execute) Experienc e (report +	My work Lecturer +	The binary Optical Panel The piece Seven Install it And its applications The resistor The approved person On The light(LDR)- The binary The emitter For light -	Look + My work	4	28
Editorial + My work Execute) Experienc e (report +	Lecturer + My work	transistor Optical - Install it - His work - Its applications - The process	Look + My work	4	30 29

An introduction to semiconductors (KI Gross JY Rwood)& Electronics Capacity1991- Written by Dia Mahdi ،knight Ibrahim Taha	A Books And references Which Recommended With it) Magazines Scientific , Reports ....,(
Source The Internet different	ب - References ،electronic Locations The Internet ....
.19Plan Development The decision Academic	
9- Participation In Courses different Private By substance 10- Informing On Another What I arrived For him Technology Modern In This Article 11- Preparation Courses Which Develop From Capability Trainers In The laboratory They can't From Training The request In a picture Efficient 12- Increase Laboratories With devices Modern Which Keep up Development Scientific In Countries Advanced	

The worker And workshops

Acquisition The student Skills Manual In Use Number Manual And tools Measurement And turn on Devices And the places
And use it In All Workshop

Technical Institute / Awsat University-Furat Al-Al Samawa -	.28The institution Educational

Technologies Electrical Class The first	.29Section Scientific / The center
The worker And workshops	.30Name / Symbol The decision
Section	.31Programs Which He enters In it
Attendance Mandatory Daily	.32Forms Attendance available
Year Academic2024/2023	.33Chapter / Year
6 Practical= 30*A week =180An hour Annually	.34Number Hours Academic (total)
2024/20/4	.35Date Preparation This Description
	.36Objectives The decision
Acquisition The student Skills Manual In Use Number Manual And tools Measurement And turn on Devices And the places And use it In All .Workshop	
Acquisition The student Skills Manual In Use Number Manual And tools Measurement And the ability On Work And turn on The places In the way Example	
Focus On Training The student On Work The refrigerator In a picture Correct And how Use Tools Measurement And the cooler And the pieces By publishing And the hole And the Qalwaza	
It is done Focus Training In Workshop Welding On Different Number And tools And devices existing Inside The workshop In the way Example	
Focus On Training The student On How Planning On Sheets Mineral And how The piece And assembly And practical Welding And assembly And practical Welding For sheets Using Tools Planning And the pieces Manual And the mechanic And tools The second And tools Welding Manual And the mechanic	

It is done Focus On Training The student On Machines Lathe different And training On Tools Measurement necessary To implement Exercises
Various And how Work Teeth Foreign affairs And the interior And how Choose Pens The piece

It is done Focus Training On Use Number And tools Carpentry And tools Measurement used And get to know On Machines Carpentry different
And procedures Safety Maintenance Machines

It will be The student Able On :That
.1It is used Devices And the number And the components different used In Workshops
.2He earns The skill And experience Technical In Field Business Maintenance Electrical different
.3He earns Trust In the same way To practice Work Technical Electrical In To be continued Malfunctions And get to know On How Fix it
.4He distinguishes And he knows On Different Components Electrical and electronic And how Use it In Building Circles different

.20Outputs The decision Ways Education And learning And evaluation

A Objectives Knowledge

A1Definition The student To Skills Manual In Use Number Manual And tools Measurement And turn on Devices And the places
A2Definition The student On Work The refrigerator In a picture Correct And how Use Tools Measurement And the cooler And the pieces
A3Definition The student And to train him On Welding On Different Number And tools And devices Private
A4Definition The student And training him On Machines Lathe different
A5Definition The student On Use Number And tools Carpentry And tools Measurement used And get to know On Machines Carpentry
different
A6Training The student On Business Maintenance Electrical different
A7Definition The student On Work Technical Electrical In To be continued Malfunctions

ب - Objectives skills Private .By decision

ب1- Action Experiments Private In Use Number Manual And tools Measurement And turn on Devices And the places
ب2- Acquisition Skill Use Tools The refrigerator In a picture Correct
ب3- Acquisition Skill Welding On Different Number And tools And devices Private
ب4Acquisition Skill Use Machines Lathe different
ب5Acquisition Skill Use Number Carpentry
ب6Acquisition Skill Business Maintenance Electrical different
ب7Acquisition Skill To be continued Malfunctions And how Fix it

Ways Education And learning
Lectures Theory + Experiment Laboratory + Use And touch Device Measurement + Movies Scientific
Ways Evaluation
Editorial + My work + Oral + Discussion
C Objectives Existentialism And value C1Must My house Exercises) (Student C2Lectures Theory C3Skills Application Inside The laboratory C4Discussion Inside Class
Ways Education And learning
Lectures + My work + Movies Scientific + Discussion
Ways Evaluation
Editorial + My work + Oral + Discussion
- Skills Public And qualification movable) Skills The other related Capable Employment And development Personal .(1Skills Application Inside The worker And workshops And laboratories 2Movies Scientific 3Visits Scientific 4Skills Use Components Electrical different 5Skills In Use Machines Welding And the lathe And plumbing And the refrigerator And carpentry In a way For example 6- Skills To be continued Malfunctions And repair it 7Skills Business Maintenance Electrical different 8Skills Action Experiments The process Which Check The side Theoretical

.21Structure The decision

A way Evaluation	Education A way	Name The unit / Or The topic	Outputs Learning required	Hours	The week
Editorial + My work	Lectures + My work	.A Safety Professionalism Inside The workshop It includes: .1Awareness And warning From Risks Operations Industrial .2Awareness From The parts The danger And the roundabout .3Use Rates Prevention Personality .4Use A tie The head In proportion For females To cover Hair .5No Wearing Strings The neck And a bracelet The hand And ties The neck .J Tools :Measurement The ruler) - A bar Measurement - Introduction That Vernier - And the micrometer And how Use it And the governorate (on her .C Process Planning :(Thank you) Surfaces The basis Number used And she is The man) Justice - A man Planning - The sin And how The humiliation - Article Showing - The corner List - The calligrapher The normal - The calligrapher Sensitive - Measure Height - The transfer University And measure (angles . The cooler Its types - Its forms - How Use it And the governorate On her And organize it .E Scythes Its types Ways Connect The objects On her Exercise Simple On Operations The cold And planning And just like that The drawing Executive	My work Workshop The refrigerator	6	The first
Editorial + My work	Lectures + My work	The piece :With a chainsaw The saw Manual And a weapon The saw - Install Weapon The saw - Terms Duty Availability In Process Publishing Exercise Includes - Planning - Publishing And just like that Dimensions Data By drawing Executive	My work Workshop The refrigerator	6	The second
Editorial + My work	Lectures + My work	The hole Types The driller In all kinds Prime And how Use it Exercise Includes - Planning - The hole And just like that Dimensions Plans By drawing Executive	My work Workshop The refrigerator	6	Third

Editorial + My work	Lectures + My work	.A Safety Professionalism Inside The :workshop It includes .1Awareness And warning From Risks Operations Industrial .2Awareness From The parts The danger And the current The electrician .3Use Rates Prevention Personality - Suits Work - Condoms The face And the eyes - Condoms Breathing .4Ventilation The correct health Inside The workshop .5Knowledge Use Condoms Combat The fire .6Use Roads The correct health When Transfer And use Cylinders Gases used In Operations Welding .ب Number And tools used In The workshop .C Places Welding The arc The electrician - Its parts - A way Activate it . Wires Welding Its types - Its measurements - Choose it Implementation Exercises Welding	WorkYes Workshop Welding	6	Fourth
Editorial + My work	Lectures + My work	Implementation Exercise Welding Lines) Pinch (dictation	My work Workshop Welding	6	Fifth
Editorial + My work	Lectures + My work	Welding With gas Oxy Estlin .A Safety Professionalism When Work .ب Types Gases used - Materials Help .C Equipment used In Welding Ghazi-Al And how Use it Implementation Exercises Welding) Self - Welding Via Wire Select - Welding Via Wire (Brass	Workshop Welding	6	Sixth
Editorial + My work	Lectures + My work	.A Safety Professionalism Inside The :workshop It includes .1Awareness And warning From Risks The result About Use Machines The piece And the second .2Use Roads The correct health When Transfer The boards Mineral .3Use Rates Prevention Personality Condoms) The hand Condoms (ear .4The governorate On Cleanliness Floor The workshop From The piece Mineral The small one .ب Tools Measurement .C Tools Planning . Types Sheets and its policies Exercise My work Using Tools mentioned Figures) Engineering (different Implementation Exercises Welding	My work Workshop Plumbing	6	Seventh

Editorial + My work	Lectures + My work	.A Machines The piece And the second .ب Machines Welding The point Implementation Exercise On Operations Planning And the pieces And the second And welding The point	My work Workshop Plumbing	6	Eighth
Editorial + My work	Lectures + My work	Ways Connecting The school Manual - The school America Implementation Exercise On Operations Planning And the pieces And connectivity	My work Workshop Plumbing	6	Ninth
Editorial + My work	Lectures + My work	.A Safety Professionalism Inside The workshop It includes: .1Awareness And warning From Risks The result About Work On The dangers .2Use Rates Prevention Personality - Protective -The two eyes Suits Work .3No Wearing Strings The neck And a bracelet The hand And ties The neck .4Use A tie The head In proportion For females To cover Hair .5Follow Roads The correct health To operate And no Leave Key Installation In The parts ،The roundabout And make sure From Existence Condoms The places .6The governorate On Cleanliness The workshop From Waste Work .ب The lathe Its parts And how Work On her - Tables Speeds - Types Pens Lathe - Connect Activities - Adjust The center - Tools Measurement .C Implementation Operations Lathe Level) - Adala - (school With Use Tools Measurement	My work Workshop TheLathe	6	Tenth
Editorial + My work	Lectures + My work	Explanation Laws Lathe The stolen property Foreign affairs And the interior Implementation Exercise Lathe Not robbed External And robbed Internal	My work Workshop TheLathe	6	st1 Ten
Editorial + My work	Lectures + My work	Explanation Laws Teeth Foreign affairs And the interior Implementation Exercise Lathe Teeth External And internally	My work Workshop TheLathe	6	The second Ten
Editorial + My work	Lectures + My work	.A Safety Professionalism Inside The workshop It includes: .1Awareness And warning From The parts The danger And the roundabout .2Use Rates Prevention Personality When Work - Condoms Breathing - Suits Work - Condoms Al Ain .3Ventilation The correct health Inside The workshop .ب Types Wood And its sources and its uses .C Tools Measurement And the number Manual used In Workshop Carpentry Implementation Exercise Shape Parallel The ribs	My work Workshop Carpentry	6	Third Ten
Editorial + My work	Lectures + My work	Definition With machines existing In Workshop Carpentry And procedures Safety And maintenance necessary - Work Exercises How Connecting Between Part Wood To activate it On AuthorityT	My work Workshop Carpentry	6	Fourth Ten
Editorial + My work	Lectures + My work	Definition The student In a way Manufacture Wood - Ciphers Its types - Its forms Implementation Exercise Dig Various	My work Workshop Carpentry	6	Fifth Ten

Editorial + My work	Lectures + My work	Principles Basic In Security Industrial Which He needs it The student Inside The workshop To protect him From Traumas Electrical And the ways The ideal Using Number On Difference Its types Getting to know On The countries Standard For wires used Using Tables And how Ejad Wires Reward From Same The metal Oh From Metals Other In case No Existence Size From Wires And training On Use Devices Inside Workshops And training On Use micrometer To measure Qatar Wires used In The file And also Training On Use French For measurements Public	My work	6	Sixth Ten
Editorial + My work	Lectures + My work	Training On Process Welding In a way Good Using Caustic Electrical That) Capabilities (different And get to know On Part Caustic Study Types Isolation ،And insulation Isolate Files About ،body Isolate Files About ،some of them Isolate Wires The same And its applications	My work	6	Seventh Ten
Editorial + My work	Lectures + My work	Types different ،for resistances Materials used In ،manufacture Ways ،encode it Values Favorite ،for resistances How Check ،Resistances Resistances ،variable ،Its types Classification And he checked it ،and its uses Some Resistances ،privateNTC،PTC،VORand ،its uses Replace Resistances Damaged And the things Which Must Consider it In ،That Types different ،For expansions How ،manufacture Ways Encoding ،expansions Check ،expansions Replace Expansions Damaged And the things Which Must Consider it In ،That Building Circle The preferred one And the complete Using Resistance And spacious And he checked it	My work	6	Eighth Ten

My work	+ My work	Conclusively The current Against Leakage GroundEarth leakage current circuit breaker Conclusively Effort Against Leakage GroundEarth leakage voltage circuit breaker Places Installation Sections Protection Against Leakage The patient (ElCB):، Select Price The cutter According to Pregnancy	My work		Ten
Editorial + My work	Lectures + My work	Device Measure Energy Electrical Unilateral Phase And the third Phases(Single and three phase kwh meter) Theory Work And connectivity (wiring) And installation And how ،reading Installation The number Means Settings For the counter When Errors Speed) - Crawling - Download (light The number Smart - Its components And a way Link it And his reading	Look + My work	4	Ninth Ten

Editorial + My work	Lectures + My work	Check And test Institutions Electrical Implemented household And industrial Check Investigation About Polarity ، Test Resistance Isolation ، Test Continuity The department The ring How Create The error In Cables Nutritional For establishments Electrical Part) - Request - (All kinds Select A place Holidays Ground In Connectors Using Ring Mori	Look + My work	4	The twenty
Editorial + My work	Lectures + My work	Circles Alert And the warning - Components The department (bells) The keys Compressor - Detectors Heat And the flame ،and smoke ،Indications Source ،Nutrition Connectors And they met Connectivity And its specifications	Look + My work	4	st1 And the tenth n
Editorial + My work	Lectures + My work	Devices Alarm And protection Open) - (closed Against The fire And theft Systems Monitoring Interior And external (cameras) ، Systems Warning And he revealed The fire Applications Lighting Laser Lighting With fibre Photovoltaic Systems Lighting By voice	Look + My work	4	The second And the tenth n
Editorial + My work	Lectures + My work	System Summon User In Hotels And restaurants And hospitals - System Contact Internal System The signal In Circles And hospitals	Look + My work	4	Third And the tenth n
Editorial + My work	Lectures + My work	Engines The current ContinuousDC Motors Installation - Theory Work - Classification Applications Engine The current Continuous How Wiring Examples Sports Solved	Look + My work	4	Fourth And the tenth n
Editorial + My work	Lectures + My work	Engines The current AlternateAC Motors Engine Single Phase Installation) - Theory Work - (types Single phase induction motor Engine Triple Phase Installation) - Theory Work - Types Three phase induction motor	Look + My work	4	Fifth And the tenth n
Editorial + My work	Lectures + My work	Circles Capacity And circles Controlpower circuit and control circuit The keys used In Circles Control - The keys Compressorpush button- The keys The roundaboutON-) (Rev-ON-OFF) (OFFKey Dizziness Star Delta)(Y Circle Ability And a circle Control To turn on Engine Single Phase And your engine Triple Phase	Look + My work	4	Sixth And the tenth n
Editorial + My work	Lectures + My work	Locations Aerial (operators)Contactor Installation - Theory Work - Effort Operation - Circles Control On Work The pickup(Contactor)، Types Locations Information The written one On The pickup She is Effort The file ، Effort Poles ، A stream Or Ability Poles And time Operation Explanation Circle Activate Device He separated him(ON-OFF)Using Key Presspush buttonOne And only	Look + My work	4	Sevent h And the tenth n
Editorial + My work	Lectures + My work	The follower Thermal Against Increase The current Installation) - Theory Work - Adjust Legalized The current - (uses Protection System Increase The current The timeline The reverse -Inverse	Look + My work	4	Eighth And the tenth n

		Time Over current Relaying Example			
Editorial + My work	Lectures + My work	The follower The timeTIMER Its types Mechanical) - Electronic The program (- Theory Work - Adjust Time - ups-Follow That Effort Low Types The follower The time From Where The job Types The follower The time From Where Installation Its applications In Circles Institutions Electrical	Look + My work	4	Twenty nine-
Editorial + My work	Lectures + My work	Inspection And the test For establishments ElectricalTesting and inspection of Installation Devices Test Ohmmeter Measure) (resistance ، System The bell Or Lamps By battery ، Device The maker ، Device Test Ground Types Test Test Polarity ، Test Quality System Ground ، Test Resistance Insulator Wires ، Test Continuity The department Background	Look + My work	4	Thirty

Editorial + My work	Lectures + My work	Types different For files ، ‹manufacture ‹Examine it Ways Encoding And reading Conversation ‹file Transformers Electrical As an application On ‹files Its types ‹and its uses Ways ‹Examine it Building Circle The joints And the complete Using Resistance And a conversation And he checked it It's like ‹connectors ‹diode A way Examine it And determine ‹Its poles ‹Its uses The zener ‹David ‹In particular Its uses As expansive Changed ‹price Building Circle Unified Half Wave And he checked it ‹transistor A way ‹Examine it Select ‹Its type NPN‹PNP‹ Select ‹Its poles ‹emitter ‹The mosque ‹Qaeda-Al Systems Numbering ‹transistor The system ‹European The system ‹American Ejad Rewards Between Systems different In Numbering transistor	My work	6	Ninth Ten
Editorial + My work	Lectures + My work	The boards The printed matter And regular used In Building Circles ‹electronic How ‹Perforating it How Design Circles Electronic And install it On The boards ‹printed Welding On The boards ‹printed Install Different Components Electronic And welding it On The board ‹printed Your thinking Circles Electronic Installed On The board The printed matter And raise ‹components Cleaning The board The printed matter And tools used In That Training On Work Template Wooden One step ‹equal One step Different And get to know On Templates Mineral	My work	6	The twenty
Editorial + My work	Lectures + My work	Training On Work Files Using Types Different From Ways The winding The roll) Manual And the wrap On Template And the wrap (By package	My work	6	st1 And the tenth n
Editorial + My work	Lectures + My work	Study Part Pump Water Refrigerated Air And get to know On Types Malfunctions Mechanical And electrical Ways ‹Treat it How Reverse Direction Two turns The engine Your thinking And collect Part Pump Water Refrigerated Air And operate it After Replay Collect them And treatment ‹errors If Found	My work	6	The second And the tenth n
Editorial + My work	Lectures + My work	Training On Drawing Files Engine Pump Water Refrigerated Air And again Roll + His files And action Types ‹tests Test continuity	My work	6	Third And the tenth n
Editorial + My work	Lectures + My work	Test Leakage ‹ground Test The palace In ‹files Test Check ‹polarity Activate The engine And treatment Malfunctions Electrical And mechanics Study Theory Work The iron Electrical and its ‹parts Training On Your thinking And collect Part The iron And get to know On Types Malfunctions And how Treating it	My work	6	Fourth And the tenth n
Editorial + My work	Lectures + My work	Study Part The fan Desktop And training On Deconstruct it And again Collect them And get to know On Malfunctions Mechanical And electrical And how Treating it Study Part The fan Ceiling And training On Deconstruct it And again Collect them And get to know On Malfunctions Mechanical And electrical And how Treating it	My work	6	Fifth And the tenth n

Editorial + My work	Lectures + My work	Study Types Transformers And get to know On ‹its parts Design Simplified Wolf Converted Low That Exit One And install it ‹And he examined it Also Design Simplified Wolf Converted Low That Exit The Taken Average And install it And he checked it	My work	6	Sixth And the tenth n
Editorial + My work	Lectures + My work	Design Simplified Wolf Converted Crane That Exit One And install it And he checked it Design Simplified Wolf Converted Crane That Three Abscesses And install it And he checked it	My work	6	-Twenty seventh
Editorial + My work	Lectures + My work	Study Part Engine The The face ‹The developer Theory Work And malfunctions Mechanical And electrical Ways Treating it And how Reverse it Direction The rotation	My work	6	Eighth And the tenth n
Editorial + My work	Lectures + My work	Drawing The department Electrical For files Getting started And movement And how Connect Key Expulsion Central And expanding That ‹found Roll Files Movement And files Getting started And install it In ‹sewers Connect Files And he checked it And turn on The engine	My work	6	Ninth And the tenth n
Editorial + My work	Lectures + My work	Your thinking And collect And study Part A truck Batteries And treatment Malfunctions training ‹ expected On Welding With oxygen Acetylene And gas The questioner	My work	6	Thirty

Books Methodology

.22Structure Infrastructure

1- Books The decision required

2- References Home (Sources)

A book Scientific From Libraries

A Books And references Which Recommended With it

) Magazines Scientific , Reports ....,(

ب - References ،electronic Locations The Internet Source The Internet different

.23Plan Development The decision Academic
13- Participation In Courses different Private By substance 14- Informing On Another What I arrived For him Technology Modern In This Article 15- Preparation Courses Which Grow From Capability Trainers In The laboratory They can't From Training The request In a picture Efficient 16- Increase Laboratories With devices Modern Which Keep up Development Scientific In Countries Advanced

Mathematics

They understand Laws And equations Sports ،simple How Application Laws In Field Circles Electrical

Technical Institute / Awsat University-Furat Al-Al Samawa -	.37The institution Educational
Technologies Electrical Class The first	.38Section Scientific / The center
Mathematics	.39Name / Symbol The decision
Section	.40Programs Which He enters In it
Attendance Mandatory Daily	.41Forms Attendance available
Year Academic2024/2023	.42Chapter / Year

.24Outputs The decision Ways Education And learning And evaluation

A Objectives Knowledge

A1Definition The student On Laws And equations Sports Simple
A2Definition The student On How It applies Laws In Field Circles Electrical
A3Definition The student On Quantities The vector And quantities Not The vector
A4Definition The student On Matrices And its types And how Use it To solve Issues Electrical
A5Definition The student On Countries Triangle And its types
A6Definition The student On Principles Differentiation And integration

ب - Objectives skills Private .By decision

ب1- Acquisition Skill Use Matrices In Ejad And an account Rate The unknown In Circles Electrical
ب2- Acquisition Skill Use Laws And equations Sports different
ب3- Acquisition Skill Application Laws In Solution Issues Electrical
ب4Acquisition Skill Select Quantities different So It was Directed Oh Quantity

Ways Education And learning

Lectures Theory + Solution Issues

Ways Evaluation

Editorial + Oral + Discussion

C Objectives Existentialism And value

C1Must My house Exercises) (Student
C2Lectures Theory
C3Skills Application Inside Class
C4Discussion Inside Class

Ways Education And learning

Lectures + Discussion

Ways Evaluation

Editorial + Solution Exercises Inside Class + Must My house + Discussion

 - Skills Public And qualification movable) Skills The other related Capable Employment And development Personal .(

1Skills Use Laws And equations Sports different
2Skills Application Laws In Solution Issues Electrical
3Skills Select Quantities different So It was Directed Oh Quantity
4Skills Use Matrices In Ejad And an account Rate The unknown In Circles Electrical

.25Structure The decision

A way Evaluation	A way Education	Name The unit / Or The topic	Outputs Learning required	Hours	The week
Editorial	Lectures	Matrices / Determinants / And its characteristics	Look	6	The first
Editorial	Lectures	Solution Equations The plan - A way Kramer - Applications On Determinants - Use A way Compensation Not found Value Currents In Circle Electric Multiple Sources	Look	6	The second
Editorial	Lectures	Vectors / Analysis Vectors / Quantities The vector And the standard / Algebra Vectors / Operations Accounting For vectors In Space Acting Phase And the direction For quantities ‹alternating Angle Phase - Ejad Outcome Quantities The vector	Look	6	Third
Editorial	Lectures	One unit Vectors The cooperating parties / Measure The vector / Multiplication Standard And the direction / Applications On Vectors / The overflow Magnetic / Maxwell / Multiplication Numerical For vectors Using Angle / Multiplication Numerical For vectors Using Events	Look	6	Fourth
Editorial	Lectures	The function / Countries Triangle And relationships Triangle / Countries Logarithmic Account Value The current Continuous For a circle Half Qantara / Account Value Effective For voltage / Line Pregnancy for transistor	Look	6	Fifth
Editorial	Lectures	The function Basic / Dwal The piece Plus / Applications Drawing Countries Basic For a circle Electric From Degree ‹The first Acting Circle FilterRCWith a switch Political	Look	6	Sixth
Editorial	Lectures	Objectives / A purpose Countries Algebra And the triangle / Applications On Objectives	Look	6	Seventh
Editorial	Lectures	Differentiation / The derivative / Derivative Countries Algebra / A rule The series - Building Circle Differentiation / Account Speed And acceleration - Speed The light	Look	6	Eighth
Editorial	Lectures	The function Guarantee / The function Standard The derivative That Mattresses Aliya / Acting System Physics By function Guarantee	Look	6	Ninth
EditYes	Lectures	Derivative Countries Triangle / Derivative Countries Logarithmic / Account Value Effective To stream In CircleRLC/ Earn Voltage By bill	Look	6	Tenth
Editorial	Lectures	Derivative Countries Basic / Derivative Countries excess / Account Steady Time	Look	6	Tenst1
Editorial	Lectures	Applications The derivative / Equation The diamond And the column / Speed And acceleration / Change Accounts Rate Change Voltage And the current In exchange Time	Look	6	Ten The second
Editorial	Lectures	Increase And the decrease / The endings Great And the smallest / Points The coup / Drawing Countries Drawing Response For a circle From Degree The secondRLC	Look	6	Ten Third
Editorial	Lectures	Applications Physics And engineering General	Look	6	Ten Fourth
Editorial	Lectures	Integration / Integration Not The specified one / Complete Countries Algebra .And logarithmic	Look	6	Ten

		Account Value Shipment Expansive			Fifth
Editorial	Lectures	Complete Countries Basic And the triangle	Look	6	Ten Sixth
Editorial	Lectures	Integration The specified one / Applications Integration The specified one / The space Under The trend / The space Between They are bent over / Accounts Capacity Electrical	Look	6	Ten Seventh
Editorial	Lectures	Sizes Rotational / Long A bow The curve	Look	6	Ten Eighth
Editorial	Lectures	Applications Physics And engineering Work) - Determination - Momentum - Determination Palaces (self	Look	6	Ten Ninth
Editorial	Lectures	With equations Integration / Circle Big Using The department Integrated Building Circle The complete Using Resistance And a conversation / Acting Circle Electric Partial Political and logarithmic Ways General In Integration It includes Compensation And fragmentation And use Fractions	Look	6	The twenty
Editorial	Lectures	Effective Lamqom My ability Ejad Distance From Acceleration And speed = Ejad Value The current Roads Numerical In Integration / A rule Almost The deviant / A rule Samson	Look	6	n And the tenth st1

Applications The computer

Education The student Basics The computer And system Operation And they are important Orders

Technical Institute / Awsat University-Furat Al-Al Samawa -	.46The institution Educational
Technologies Electrical Class The first	.47Section Scientific / The center
Applications The computer	.48Name / Symbol The decision
Section	.49Programs Which He enters In it
Attendance Mandatory Daily	.50Forms Attendance available
Year Academic2024/2023	.51Chapter / Year
1Look2 +My work =3*30A week =90An hour Annually	.52Number Hours Academic (total)
20/4/4 202	.53Date Preparation This Description

.54Objectives The decision
The goal From :Article Education The student Basics The computer And system Operation And they are important Orders
Education The student Login To Program The drawingAUTOCADAnd get to know On Interface The drawing And Orders The drawing And amendment
Login To The drawing Triple Dimensions3D
Education The student Understood Viruses Ways Combating it

.26Outputs The decision Ways Education And learning And evaluation

A Objectives Knowledge

A1Definition The student Basics The computer And system Operation And they are important Orders

A2Definition The student By entering To Program The drawingAUTOCADAnd get to know On Interface The drawing And Orders The drawing And amendment

A3Definition The student On The drawing Triple Dimensions3D

A4Definition The student On Viruses Ways Combating it

ب - Objectives skills Private .By decision

ب1- Acquisition Skill Use The computer And his programs different

ب2- Acquisition Skill The drawing Triple Dimensions

ب3- Acquisition Some Skills In Program AutoCAD

ب4Acquisition Skill In Knowledge Types Viruses Ways Combating it

Ways Education And learning

Lectures Theory + Experiment Laboratory + Movies Scientific

Ways Evaluation

Editorial + My work + Oral + Discussion

C Objectives Existentialism And value

C1Must My house Exercises) (Student

C2Lectures Theory

C3Skills Application Inside The laboratory

C4Discussion Inside Class
Ways Education And learning
Lectures + My work + Movies Scientific + Discussion
Ways Evaluation
Editorial + My work + Oral + Discussion
- Skills Public And qualification movable) Skills The other related Capable Employment And development Personal .(1Skills Application Inside The laboratory 2Movies Scientific 3Skills Use The computer 4Skills In Combat Viruses 5Skills Use Program The drawing AutoCAD 6- Skills Design Fees Three Dimensions

.27Structure The decision					
A way Evalua tion	A way Educati on	Name The unit / Or The topic	Outputs Learnin g required	Hours	The week
Editorial	Lectures	Units Measure Memory ، Definition Files And folders Calculator Material And Means Entry And Exit In it ، Software ، Definition With calculations And its benefits ، Her generations ، Connect Parts Calculator Components	Look	6	The second The first -
Editorial	Lectures	To Programs Exit From The system Turn off the calculator To enterSTART، Benefit FromTASKBAR Tasks Dealing With Activities ،mouse Importance And components A bar ، Understood The icon ، StyleDESKTOPFor a surface The office Requirements Basic To operate ، Components The screen Home ، Advantages The systemWINDOWS7 ، System Operation	Look	6	Fourth Third
Editorial	Lectures	Files And folders And the story And paste ، CopyRECYCLE BIN،DOCUMENTS MY،COMPUTERWith Icon Understood Window And get to know On Its components Home Dealing	Look	6	Sixth Fifth
Editorial	Lectures	SAVER WINDOWS COLOR، Save The screen SCREEN DESKTOP BACKGROUND، Change Colors Windows Features Files And folders And the disks ، Change Background Surface The office	Look	6	Eighth Sevent h

Editorial	Lectures	To turn on Files Video WORDPAD،WINDOSWS MEDIA PLAYER CalculatorCALCULATOR، On Some AppendicesACCESSORIES For example FEATURESAnd how Delete Programs Which Done Install it ، Getting to know Mouse ، Programs And its characteristics PROGRAM AND Getting to know On Panel ControlCONTROL PANAL، Features	Look	6	And the tenth Ninth
Editorial	Lectures	ProgramAUTOCAD:Definition ، Its importance ، Install it ، Activate it Getting to know On Interface The programme Ways Access To Orders ، Formation File New And Store And it opened Files ، Orders Help DRAWING LIMITS ،UNITS	Look	6	Ten st1
Editorial	Lectures	:CommandsOSNAP،ORTTHO،LWT،OTRACK، POLAR،SNAP،GRID،DISTANCE،AREA	Look	6	Ten The second
Editorial	Lectures	Tools VisionVIEW: The matterZOOMAnd the matterPAN، The matter REGEN	Look	6	Ten Third
Editorial	Lectures	Orders The drawing BasicDRAW:LINE، MULTILINE، CONSTRUCTION LINE،POLYLINE، POLYGON ،RECTANGLE،ARC،CIRCLE،DONUT ،REVCLOUD،SPLINE،ELLIPS،MACKE BLOCK،INSERT BLOCK،MBLOCK،WBLOCK ،HATCH،REGION	Look	6	Ten And sixth Ten Fourth
Editorial	Lectures	Orders ModificationMODIFY:ERASE،COPY، MIRROR، OFFSET،ARRAY،MOVE،ROTATE،SCALE، CHAMFER،FILLET،STRETCH،TRIM، EXTEND،BREAK،EXPLODE	Look	6	&18 17
Editorial	Lectures	Orders WritingTEXT:And modify it MULTILINE TEXT، SINGLE LINE TEXT، How Work Model STYLENew To write ، Getting to know On Center DesignDESIGN CENTERAnd benefit From Templates Electrical made-Ready	Look	6	20&19
Editorial	Lectures	Orders :DivisionMEASURE،DIVIDEControl With specifications :DrawingLINETYPE،LINE WEIGHT،COLOR، Modify Features Fees :UsingPROPERTIES،MATCH PROPERTIES،GRIPS	Look	6	22&21
Editorial	Lectures	DimensionsDIMENSION	Look	6	23
Editorial	Lectures	Entry To The drawing The third Dimensions ، Features The drawing The third Dimensions ، Types Fees The third Dimensions ، Getting to know On OrdersELEVAnd	Look	6	24

		THICKNESS			
Editorial	Lectures	Preview The drawing The third Dimensions Using ، 3DVIEWDivision Screen The drawing	Look	6	26&25
Editorial	Lectures	The third Dimensions UsingVPORTS، System Events UserUCS	Look	6	28
Editorial		Create Surfaces The third Dimensions3D SURFACE	Look	6	30&29
		Create The body Solid The third Dimensions3D SOLIDS			
		Understood Virus Accounts ، Motivation Spread Viruses ، How Injury			
		With the virus ، Types Viruses According to Nature Injury And harm ،			
		Signs Injury Viruses For calculating ، Precautions Duty Take it			
		To avoid Login Viruses For accounts ، Dealing With One Programs			
		The antagonist For viruses			

.12Structure Infrastructure

1- Books The decision required

Books Methodology

2- References Home (Sources)

A book Scientific From Libraries

A Books And references Which Recommended With it

) Magazines Scientific , Reports ....,(

ب - References ،electronic Locations The Internet Source The Internet different ....

.13Plan Development The decision Academic

17- Participation In Courses different Private By substance

18- Informing On Another What I arrived For him Technology Modern In This Article

19- Preparation Courses Which Develop From Capability Trainers In The laboratory They can't From Training The request In a picture Efficient

20- Increase Laboratories With devices Modern Which Keep up Development Scientific In Countries Advanced

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The drawing Engineering And the electrician

It aims To Graduation Staff Able On Design Circles Electrical Using The computer

2024/20/4	.55The institution Educational
Technologies Electrical Class The first	.56Section Scientific / The center
The drawing Engineering And the electrician	.57Name / Symbol The decision
Section	.58Programs Which He enters In it
Attendance Mandatory Daily	.59Forms Attendance available
Academic year 2023/2024	.60Chapter / Year
3* practical 30= A week 90An hour Annually	.61Number Hours Academic (total)
2024/20/4	.62Date Preparation This Description
	.63Objectives The decision

It aims To Graduation Staff Able On Design Circles Electrical Using The computer
Definition The student On Importance The computer In Drawing And design Circles Electrical

He knows The student On How Use The computer In Institutions Electricity

.28 outputs The decision Ways Education And learning And evaluation
A Objectives Knowledge A1- Definition The student On Design Circles Electrical Using The computer A2Definition The student On How Use The computer In Institutions Electrical A3Definition The student On Drawing Circle Activate And a circle Control For engines Electrical A4Definition The student On Foundations Building Small Oh Home Residential Via The computer A5Definition The student To How Drawing Model From Pregnant women Cables A6-
ب - Objectives skills Private .By decision ب1- Acquisition Skill Design Circles Electrical Using The computer ب2- Acquisition Skill Use The computer In Institutions Electrical ب3- Acquisition Skill Drawing Circle Activate And a circle Control For engines Electrical ب4Acquisition Skill Work Establishment Electric Building Small Oh Home Residential Via The computer ب5Acquisition Skill Drawing Model From Pregnant women Cables
Ways Education And learning
Lectures Theory + Use The computer In The laboratory + Movies Scientific How Use Program AutoCAD
Ways Evaluation
Editorial + My work + Oral + Discussion
C Objectives Existentialism And value C1Must My house Exercises) (Student C2Lectures Theory C3Skills Application Inside The laboratory C4Discussion Inside The laboratory

Ways Education And learning
Lectures + My work + Movies Scientific + Discussion
Ways Evaluation
Editorial + My work + Oral + Discussion
- Skills Public And qualification movable) Skills The other related Capable Employment And development Personal .(1Skills Application Inside The laboratory 2Movies Scientific 3Skills Design Circles Electrical Using The computer 4Skills Use The computer In Institutions Electrical 5Skills Drawing Circle Activate And a circle Control For engines Electrical 6- Skills Work Establishment Electric Building Small Oh Home Residential Via The computer 7Skills Drawing Model From Pregnant women Cables

.29Structure The decision

A way Evaluation	Education A way	Name The unit / Or The topic	Outputs Learning required	Hours	The week
My work	Lectures + My work	Importance The drawing Engineering . Getting to know On Interfaces Program .AutoCAD Ways Implementation Orders ،autocad Ways Exit .From her Transportation Between ،interfaces Show Lists , Show The police .And hide it	WorkYes	3	The first
My work	Lectures + My work	Ways Drawing The straight In a way Coordinates Cartesianism the way ، Relativity And the way .Polarity	My work	3	The second
My work	Lectures + My work	Orders ،display Dimensions Environment Work Limits The drawing And units , Save The file Then Possibly Open it In Copy Previous for the programme Using Orders Next : (Zoom, drawing. drawing limits, Units, Options)	My work	3	Third
My work	Lectures + My work	Orders Accuracy The drawing SNAP, GRID, ORTHO, POLAR, OSNAP, (OTRACK, DUCS, DYN, LWT) Drawing Bodies Isometrics Using He ordered The networkGRID	My work	3	Fourth
My work	Lectures + My work	Orders Drawing The elements : (Rectangle, Circle, polygon, arc, Ellipse, Donut, Wipeout, Revision Cloud)	My work	3	Sixth Fifth
My work	Lectures + My work	Orders Modification (Erase, copy, Move, Mirror, Offset, Scale, stretch, Rotate)	My work	3	Seventh
My work	Lectures + My work	Mode Dimensions different On Elements The drawing And control With it Using Square Dialogue Pattern Dimensions Linear, Aligned, Arc Length, Radius, Diameter, Angular, Baseline, Continue,-Mleader, …Dimension Style	My work	3	Eighth
My work	Lectures + My work	Control With specifications The drawing) Types ،fonts Colors ،elements Its characteristics (Properties)And transfer Characteristics For an item Another(Match (Properties)	My work	3	Ninth
My work	Lectures + My work	Orders Drawing The elements Home :Other (Polyline, Point, Spline, Helix, Table)	My work	3	Tenth
My work	Lectures + My work	Orders Modification :Other (Array, Trim, Extend, break, Fillet, Chamfer, Explode,Align)	My work	3	Ten st1
My work	Lectures + My work	Addition TextsSingle Line &Multiline Text, Its methods And control With its specifications .	My work	3	Ten The second

My work	Lectures + My work	Account Spaces(Area)And the size(Volume)And the lengths (Distance)And events Points(ID Point) Specifications The elements(List)Using The matterInquiry Dealing With Orders A barParametric	My work	3	Ten Third
My work	Lectures + My work	Fragmentation And shading(Hatch, Gradient)And sectors	My work	3	Ten Fourth

My work	Lectures + My work	Layers(Layers)And control In Preparing it .	My work	3	1615
My work	Lectures + My work	Blocks(Blocks), Its types And include it And control In .Its specifications	My work	3	1817
My work	Lectures + My work	Convert The drawing From Binary Dimensions To Triple Dimensions Orders (Region, Boundary, Join)	My work	3	19
My work	Lectures + My work	Surfaces And the bodies Orders The shapes Basic Three Dimensions (Box, wedge, Cone, sphere, cylinder, Tours, Pyramid)	My work	3	20
My work	Lectures	Orders Create Body Three Dimensions (Extrude, Press/pull, polysolid, Union, Subtract,	My work	3	21

	+ My work	intersect, Revolve, Sweep, Loft)			
My work	Lectures + My work	Orders Modification On The body (Shell, Separate, Slice, Thicken) Dealing With Orders A bar Events(Ucs)	My work	3	22
My work	Lectures + My work	Drawing ،location Use Orders The programme To show The average	My work	3	23
My work	Lectures + My work	Printing	My work	3	24
My work	Lectures + My work	Drawing Circles Electrical Use In a library The programme To use Symbols existing In Center Design(Design Center) Drawing Symbols Not existing In The programme Save Symbols In File Special For help With it In Files New	My work	3	25
My work	Lectures + My work	Drawing Some Circles Electrical and electronic Drawing Waves Entry And output The pocket Or Yes Wave Other	My work	3	2726
My work	Lectures + My work	Drawing Circle Activate And a circle Control For your engine	My work	3	28
My work	Lectures + My work	Example About Institutions Building Small Oh Home .Residential	My work	3	29
My work	Lectures + My work	Drawing Model From Pregnant women Cables (Cable Trays).	My work	3	30

.30Structure Infrastructure	
Basics The drawing Engineering Written by Abdel The Praiseworthy Friday Project A book The drawing The electrician Written by Hani Aziz	1- Books The decision required
graphic. graphic technology (by&Engineering drawing. drawing Friend) Engineering drawing. drawing technology (by AW Wander William)	2- References Home (Sources)

Odell For connections Electrical in) Lighting (And strength Engineering drawing. drawing technology (by MC Graw)	A Books And references Which Recommended With it) Magazines Scientific , Reports ....,(
Source The Internet different	ب - References ،electronic Locations The Internet ....

.31Plan Development The decision Academic
21- Participation In Courses different Private By substance 22- Informing On Another What I arrived For him Technology Modern In This Article 23- Preparation Courses Which Develop From Capability Trainers In The laboratory They can't From Training The request In a picture Efficient 24- Increase Laboratories With devices Modern Which Keep up Development Scientific In Countries Advanced

Rights being human No democracy And

It aims The decision To Definition The student On His rights And his duties Towards The community

Technical Institute / Awsat University-Furat Al-Al Samawa -	.64The institution Educational
Technologies Electrical Class The first	.65Section Scientific / The center
Rights A human being And democracy	.66Name / Symbol The decision
Section	.67Programs Which He enters In it
Attendance Mandatory Daily	.68Forms Attendance available
Year Academic2024/2023	.69Chapter / Year

2* My view 30A week 60 =An hour Annually	.70Number Hours Academic (total)
2024/20/4	.71Date Preparation This Description

.72Objectives The decision
It aims The decision To Definition The student On His rights And his duties Towards The community
Consolidate Understood democracy In That's it The student Make it Culture Behavior And application
Definition The student On The most important Laws International Which Organize Principles Rights Human
Consolidate In That's it The student That Human Free In Choose Believed And his direction The political

.32Outputs The decision Ways Education And learning And evaluation
A Objectives Knowledge A1Definition The student With his rights And his duties Towards The community A2Definition The student On Understood democracy And make it From His culture And his behavior A3Definition The student On The most important Laws International Which Organize Principles Rights Human A4Definition The student On That Human Free In Choose Believed And his direction The political
ب - Objectives skills Private .By decision ب1- Acquisition Knowledge With his rights And his duties ب2- Acquisition Experience In Choice democrat That's right ب3- Acquisition Knowledge Most importantly Laws International Which Organize Principles Rights Human ب4- ب5-
Ways Education And learning
Lectures Theory + Movies Scientific
Ways Evaluation
Editorial + Oral + Discussion

C Objectives Existentialism And value

C1Lectures Theory

C2Discussion Inside Class

C3-

C4-

Ways Education And learning

Lectures + Movies Scientific + Discussion

Ways Evaluation

Editorial + Oral + Discussion

 - Skills Public And qualification movable) Skills The other related Capable Employment And development Personal .(

1Movies Scientific

2Discussions different

3Acquisition Culture Legal And rights

.33Structure The decision					
A way Evalua tion	Educati on A way	Name The unit / Or The topic	Outputs Learni ng required	Hours	The week
Editorial	Lectures	Rights Human ، Definition ، Its objectives	Look	2	The first
Editorial	Lectures	Roots Rights Humans and their developments In Date :Human rights Human In The ages The old one And the mediator	Look	2	The second
Editorial	Lectures	Rights Human In Civilizations The old one Especially Attendance Valley Rafidain-Al	Look	2	Third
Editorial	Lectures	Rights Human In Laws Heavenly With Focus On Rights Human In Islam	Look	2	Fourth
Editorial	Lectures	Rights Human In The ages The middle Rights : Human In The doctrines And schools And theories Political ، Rights Human In Companies And its advertisements And revolutions (Constitutions (documents English ، The revolution America ، The revolution French ، The revolution Russian (	Look	2	Fifth
Editorial	Lectures	Rights Human In Date Contemporary And the hadith : Recognition International With rights Human Since The war International The first And a group Nations/ United Nations	Look	2	Sixth
Editorial	Lectures	Recognition Regional With rights Human : The agreement European For rights Human ، 1950The agreement America For rights Human، 1969The Charter African For rights Human، 1981The Charter Arabic For rights Human. 1994	Look	2	Seventh
Editorial	Lectures	Organizations Others governmental And rights Human The Committee) International For the cross Red ، Organization Amnesty International ، Organization Monitor Rights (human	Look	2	Eighth
Editorial	Lectures	Organizations Nationalism For rights Human	Look	2	Ninth
Editorial	Lectures	Rights Human In Constitutions Iraqi Between The theory And reality	Look	2	Tenth
Editorial	Okay Harms	The relationship Between Rights Human and public freedoms 1In Advertisement Global For rights Human	Look	2	Ten st1
Editorial	Lectures	2In Documents Regional And constitutions Nationalism	Look	2	Ten The second
Editorial	Lectures	Rights Human necessary And rights Human group	Look	2	Ten Third
Editorial	Lectures	Rights Human Economic And social And cultural And rights Human Civil And political .	Look	2	Ten Fourth
Editorial	Lectures	Rights Human Modern : The facts In Development ، The right In Environment Clean ، The right In Solidarity ، The right In Religion	Look	2	Ten Fifth

Editorial	Lectures	Guarantees Respect And protection Rights Human On Upper Egypt The National ، Guarantees In The Constitution And the laws ، Guarantees In Principle Sir The law	Look	2	Ten Sixth
Editorial	Lectures	Guarantees In Oversight Constitutionalism ، Guarantees In Freedom Press And opinion The year ، A turn Organizations Not governmental In Respect And protection Rights Human	Look	2	Ten Seventh
Editorial	Lectures	Guarantees And respect And protection Rights Human On Upper Egypt International : A turn Nations United Nations And its agencies Specialized In Providing Guarantees	Organize Ray	2	Ten Eighth
Editorial	Lectures	A turn Organizations Regional University) Arabic ، Union European ، Union African ، Organization Countries America ، Organization (ASEAN A turn Organizations International Regional Not governmental And opinion The year In Respect And protection Rights Human	Look	2	Ten Ninth
Editorial	Lectures	The theory Public For freedoms : Original Rights And freedoms ، Stop The project From Rights And freedoms The information ، Use Term Freedoms Public	Look	2	The twenty
Editorial	Lectures	Nature Functional For an understanding Freedoms Public : Considerations Philosophy To the truth Functional ، Considerations Structuralism To the truth Positional ، Considerations Economic And freedoms Public .	Look	2	n And the tenth st1
Editorial	A toilet She saw	Al Qaeda legitimacy For a country The law	Look	2	2322
Editorial	Lectures	Organizing Freedoms Public From Before Authorities Public	Look	2	And the tenth Fourth

.14Structure Infrastructure

Books Methodology	1- Books The decision required
	2- References Home (Sources)
A book Scientific From Libraries	A Books And references Which Recommended With it) Magazines Scientific , Reports ....,(
Source The Internet different	ب - References ،electronic Locations The Internet

.15Plan Development The decision Academic

Safety Professionalism

Course description

It provides a clear and comprehensive picture of occupational safety Accidents It happened and prevention and methods of protection And reduce it Work During

/ Awsat University-Furat Al-Al Samawa - Technical Institute	.73The institution Educational
Technologies Electrical Class The first	.74Section Scientific / The center
Peace Professionalism	.75Name / Symbol The decision
Section	.76Programs Which He enters In it
Attendance Mandatory Daily	.77Forms Attendance available
Year Academic2023/2024	.78Chapter / Year
2Look *15A week =30An hour Quarterly	.79Number Hours Academic (total)

.34Outputs The decision Ways Education And learning And evaluation
A Objectives Knowledge A1Definition The student For reasons Injury By current The electrician A2Definition The student On Types Injuries Electrical A3Definition The student On How Relief The injured person By current The electrician Disclaimer) (injured A4Definition The student On Process Breathing Artificial And Processing Burns A5Definition The student On Instructions necessary About Health And safety Professionalism A6Definition The student On Buildings Which Must Increase it System Warning From The fire A7Definition The student On Clothes Personality Protective
ب - Objectives skills Private .By decision ب1- Action Experiments The process For prices Primary ب2- Acquisition Skill Relief The injured person By current The electrician Disclaimer) (injured ب3- Acquisition Skill Action Process Breathing Artificial And Processing Burns ب4Acquisition Skill Knowledge Types Alerts When Danger ب5Acquisition Skill Giving Instructions About Health And safety Professionalism
Ways Education And learning
Lectures Theory + Discussion + Movies Scientific
Ways Evaluation

Editorial + Oral + Discussion
C Objectives Existentialism And value C1Lectures Theory C2Discussion Inside Class C3Experiment Application C4-
Ways Education And learning
Lectures + Movies Scientific + Discussion
Ways Evaluation
Editorial + Oral + Discussion
- Skills Public And qualification movable) Skills The other related Capable Employment And development Personal .(1Movies Scientific 2Visits Scientific 3Skills Relief The injured person By current The electrician Disclaimer) (injured 4Skills Action Process Breathing Artificial And Processing Burns 5Skills Giving Instructions About Health And safety Professionalism

.12Structure The decision

A way Evaluation	A way Education	Name The unit / Or The topic	Outputs Learning required	Hours	The week
Editorial	Lectures	Reasons Injury By current The electrician	Look	2	The first
Editorial	Lectures	Types Injuries Electrical	Look	2	The second
Editorial	Lectures	Relief The injured person By current The electrician - Clearance The injured person	Look	2	Third Third
Editorial	Lectures	Process Breathing Artificial - Processing Burns	Look	2	Fourth
Editorial	Lectures	Exam Monthly	Look	2	Fifth
Editorial	Lectures	Effects resulting About Pass The current The electrician To The land	Look	2	Sixth
Editorial	Lectures	Organization Alarm From The fire - One unit Control	Look	2	Seventh
Editorial	Lectures	Detectors The fire - Detectors The temperature - Detectors Smoke	Look	2	Eighth
Editorial	Lectures	Buildings Which Must Provide it Regularly Warning From The fire	Look	2	Ninth
Editorial	Lectures	Exam Monthly	Look	2	Tenth
Editorial	Lectures	Means Alarm The speaker And the bells And trumpets	Look	2	st1 Ten
Editorial	Lectures	Instructions About Health And safety Professionalism	Look	2	The second Ten
Editorial	Lectures	The limit From Actions And practices Others Safe	Look	2	Third Ten
Editorial	Lectures	Rates Prevention Personality - Prevention Sight - Prevention Hearing	Look	2	Fourth Ten
Editorial	Lectures	Clothes Personality Protective	Look	2	Fifth Ten

Editorial		Solution Equations differential Separate And homogeneous And the plan With Its applications different Within Field Specialization / Circles Pruning The obligation And the negative And the compound	Look	6	For the second And the tenth n
Editorial		Preparation The vehicle / Collection And the offer And multiplication And the division / Acting Engineering For the number The compound / Relationship Units Electrical By preparation The vehicle	Look	6	Third And the tenth n
Editorial		The formula Polarity / Convert Page Algebra To Polarity And vice versa / A sign Factor(j)In circles Electronic / The formula Basic In Transfer / Theory DD Muniz and its uses In Solution Circles Electrical The complex / Accounts Lines Transfer Capacity Using Constants The line	Look	6	Fourth And the tenth n
Editorial		Powers And the roots / Acting Roots By drawing / Ejad Roots For departments Electrical To select stability / Acting The star And the triangle	Look	6	n And the tenth Fifth
Editorial		Operations Statistics / Distributions Repetition / The amphitheater Repetition / The curve Repetition / probability And the range / The middle The arithmetic And engineering - The sample	Look	6	n And the tenth Sixth
Editorial		The middle And centrism And the pattern / Factor The difference - The variable The standard The middle The arithmetic / Range Deviation The standard / Contrast And distraction And relative / The relationship Between	Look	6	And the twenty Seventh
Editorial		Matrices / Determinants / And its characteristics	Look	6	And the twenty Eighth
Editorial		Solution Equations The plan - A way Kramer - Applications On Determinants - Use A way Compensation Not found Value Currents In Circle Electric Multiple Sources	Look	6	And the twenty Ninth
Editorial		Vectors / Analysis Vectors / Quantities The vector And the standard / Algebra Vectors / Operations Accounting For vectors In Space Acting Phase And the direction For quantities ،alternating Angle Phase - Ejad Outcome Quantities The vector	Look	6	Thirty

Electronic Digital

Definition The student With ingredients Electronic Digital And gates And get to know On System Numbering The logical one0And1

Technical Institute / Awsat University-Furat Al-Al Samawa -	.82The institution Educational

Technologies Electrical Class The first	.83Section Scientific / The center
Electronic Digital	.84Name / Symbol The decision
Section	.85Programs Which He enters In it
Attendance Mandatory Daily	.86Forms Attendance available
Year Academic2023/2024	.87Chapter / Year
2Look2 +My work30*4=A week 120 =an hour Annually	.88Number Hours Academic (total)
2024/20/4	.89Date Preparation This Description
	.90Objectives The decision
The goal :Year Definition The student With ingredients Electronic Digital And gates And get to know On System Numbering The logical one01 And	
The goal :Private It will be The student Able On The knowledge : With ingredients Electronic Digital Differently Its types - Install it - Its characteristics - Its uses In Circles The region - Its applications - Analysis Circles Electronic .Digital	
It will be The student Able On :That .5It works Devices Electronic Basic existing In The laboratory .6Connects The elements Electronic Digital (gates) In Circles Electronic Simple .7Knowledge Specifications And features Private At the gates .8Getting to know On Circles Application For some Components And implement it	

.35Outputs The decision Ways Education And learning And evaluation
A Objectives Knowledge A1Definition The student With ingredients Electronic The region different A2Definition The student On Systems Numbering different In binary And the eighth And sixth Decimal A3Definition The student On Use Gates The region In Circles Electronic A4Definition The student On Analysis Circles The region And its applications A5Definition The student On Devices Electronic Digital Basic existing In The laboratory A6Training The student On Connect The elements Electronic In Circles Electronic Digital A7Definition The student On Specifications And features Private By piece Electronic The region

ب - Objectives skills Private .By decision

ب1- Action Experiments The process Which Check The side Theoretical

ب2- Acquisition Skill Use Components Electronic Digital In Circles Electronic

ب3- Acquisition Skill Analysis Circles Electronic Digital And its applications

ب4Acquisition Skill Connect The elements Electronic The region In Circles Electronic Simple

ب5Acquisition Skill Design Circles Application For some Components And implement it

Ways Education And learning

Lectures Theory + Experiment Laboratory + Use And touch Device Measurement + Movies Scientific

Ways Evaluation

Editorial + My work + Oral + Discussion

C Objectives Existentialism And value

C1Must My house Exercises) (Student

C2Lectures Theory

C3Skills Application Inside The laboratory

C4Discussion Inside Class

Ways Education And learning

Lectures + My work + Movies Scientific + Discussion

Ways Evaluation

Editorial + My work + Oral + Discussion

 - Skills Public And qualification movable) Skills The other related Capable Employment And development Personal .(

1Skills Application Inside The worker And workshops And laboratories

2Movies Scientific

3Visits Scientific

4Skills Use Components Electronic In Circles Electronic

5Skills In Analysis Circles Electronic And its applications

6- Skills Connect The elements Electronic In Circles Electronic Simple

7Skills Design Circles Application For some Components And implement it

8Skills Action Experiments The process Which Check The side Theoretical

Structure The decision.36					
A way Evaluation	A way Education	Or The topic/Name The unit	Outputs Learning required	Hours	The week
+Editorial My work	Lectures My work+	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	+Look My work	4	The first
+Editorial My work	Lectures My work+	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 Access-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	+Look My work	4	The second
+Editorial My work	Lectures My work+	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 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 Access-3 Code 3.4.1 Addition 3.4.2 Subtraction 3.5 Binary Multiplication 3.5.1 Repeat Left-Shift and Add Algorithm 3.5.2 Repeat Add and Right-Shift Algorithm 3.6 Binary Division 3.6.1 Repeat Right-Shift and Subtract Algorithm	+Look My work	4	Third
+Editorial My work	Lectures My work+	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 4.3.6 NOR Gate 4.3.7 EXCLUSIVE-NOR Gate 4.3.8 INHIBIT Gate 4.4 Universal Gates	+Look My work	4	Fourth

+Editorial My work	Lectures My work+	5-Logic Families Logic Families - Significance and Types 5.1.1 Significance 5.1.2 Types of Logic Family 5.2 Characteristic Parameters 1 5.3 Transistor Transistor Logic (TTL)	+Look My work	4	Fifth
+Editorial My work	Lectures My work+	6-Boolean Algebra and Simplification Techniques 6.1 Introduction to Boolean Algebra 189 6.1.1 Variables, Literals and Terms in Boolean Expressions 6.1.2 Equivalent and Complement of Boolean Expressions 6.1.3 Dual of a Boolean Expression 6.2 Postulates of Boolean Algebra 6.3 Theorems of Boolean Algebra	+Look My work	4	Sixth
+Editorial My work	Lectures My work+	7-Arithmetic Circuits 7.1 Combinational Circuits 7.2 Implementing Combinational Logic 7.3 Arithmetic Circuits - Basic Building Blocks 7.3.1 Half-Adder 7.3.2 Full Adder 7.3.3 Half-Subtractor 7.3.4 Full Subtractor 7.3.5 Controlled Inverter 7.4 Adder-Subtractor 2	+Look My work	4	Seventh
+Editorial My work	Lectures My work+	8-Multiplexers and Demultiplexers 8.1 Multiplexer 8.1.1 Inside the Multiplexer 8.1.2 Implementing Boolean Functions with Multiplexers 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 Boolean Functions with Decoders 8.3.2 Cascading Decoder Circuits	+Look My work	4	Eighth
+Editorial My work	Lectures My work+	9-Programmable Logic Devices Fixed Logic Versus Programmable Logic 9.1.1 Advantages and Disadvantages 9.2 Programmable Logic Devices - An Overview	+Look My work	4	Ninth

+Editorial My work	Lectures My work+	10-Flip-Flops and Related Devices 10.1 Multivibrator 10.1.1 Bistable Multivibrator 10.1.2 Schmitt Trigger 10.1.3 Monostable Multivibrator 10.1.4 Astable Multivibrator 10.2 Integrated Circuit (IC) Multivibrators 10.2.1 Digital IC-Based Monostable Multivibrator 10.2.2 IC Timer-Based Multivibrators 10.3 RS Flip-Flop 10.3.1 RS Flip-Flop with Active LOW Inputs 10.3.2 RS Flip-Flop with Active HIGH Inputs	+Look My work	4	Tenth

		10.3.3 Clocked RS Flip-Flop			
+Editorial My work	Lectures My work+	10.7.1 JK Flip-Flop as D Flip-Flop 10.7.2 D Latch 10.8 Synchronous and Asynchronous Inputs 10.9 Flip-Flop Timing Parameters	+Look My work	4	st1 Ten
+Editorial My work	Lectures My work+	12-Counters and Registers 11.1 Ripple (Asynchronous) Counter 11.1.1 Propagation 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	+Look My work	4	The second Ten
+Editorial My work	Lectures My work+	13-Counters and Registers Synchronous (or Parallel) Counters 11.6 UP/DOWN Counters 11.7 Decade and BCD Counters 11.8 Presettable Counters	+Look My work	4	Third Ten
+Editorial My work	Lectures My work+	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 Conversion 12.2 D/A Converter Specifications 12.2.1 Resolution 12.2.2 Accuracy 12.2.3 Conversion Speed or Settling Time 12.2.4 Dynamic Range	+Look My work	4	Fourth Ten
+Editorial My work	Lectures My work+	15-Data Conversion Circuits - D/A and A/D Converters Types of D/A Converter 12.3.1 Multiplying D/A Converters 12.3.2 Bipolar-Output D/A Converters 12.3.3 Companding D/A Converters Types of A/D Converter	+Look My work	4	Fifth Ten
Structure Infrastructure.16					

Books Methodology	1- Books The decision required
	2- References Home (Sources)
A book Scientific From Libraries	A Books And references Which Recommended With it) Magazines Scientific , Reports ....,(
Source The Internet different	ب - References ،electronic Locations The Internet ....
.17Plan Development The decision Academic	
29- Participation In Courses different Private By substance 30- Informing On Another What I arrived For him Technology Modern In This Article 31- Preparation Courses Which Grow From Capability Trainers In The laboratory They can't From Training The request In a picture Efficient 32- Increase Laboratories With devices Modern Which Keep up Development Scientific In Countries Advanced	

.14Plan Development The decision Academic
25- Participation In Courses different Private By substance 26- Informing On Another What I arrived For him Technology Modern In This Article 27- Preparation Courses Which Grow From Capability Trainers In The laboratory They can't From Training The request In a picture Efficient 28- Increase Laboratories With devices Modern Which Keep up Development Scientific In Countries Advanced

11. Course outcomes and teaching, learning and evaluation methods
Cognitive objectives -A Introducing the student to the parts and operation of electrical machines - A1 Introducing the student to the theory of operation of direct and alternating current machines -A2 Introducing the student to operating electrical machines -A3 Introducing the student to the parts of electrical machines and transformers -A4 Introducing the student to the basic devices and equipment present in the laboratory -A5 Training the student to conduct practical tests of alternating and direct current machines -A6 Training the student to measure the efficiency of the electrical hine so that he can choose the type of machine required that is mac appropriate for the required work -A7
.The skills objectives of the course -B Conduct practical experiments that verify the theoretical aspect -B1 the skill of operating electrical machines Acquire -B2 Acquire the skill of analyzing the theory of operation of direct and alternating current machines -B3 Acquire the skill of conducting practical tests of alternating and direct current machines -B4 Acquire the skill of measuring the efficiency of electrical machines so that he can choose the type of machine required that is appropriate for the required work -B5
Teaching and learning methods
Theoretical lectures + laboratory experiments + use and contact with measuring devices + scientific films
Evaluation methods
Written + practical + oral + discussion
Emotional and value goals -C (Homework (student exercises -C1 Theoretical lectures -C2 Applied skills within the laboratory -C3 Class discussion -C4
Teaching and learning methods
Lectures + practical + scientific films + discussion
Evaluation methods
Written + practical + oral + discussion

2Look =2*30A week =60An hour Annually	43Number Hours Academic (total)
2024/20/4	.44Date Preparation This Description
	.45Objectives The decision

It will be The student Able On : That

.1He understands Laws And equations Sports Simple

.2It applies Laws In Field Circles Electrical

Electrical machines

Scientific visits -D3

for conducting practical experiments that achieve the theoretical aspect Skills -D4

Skills for operating electrical machines -D5

Skills for analyzing the theory of operation of direct and alternating current machines -D6

alternating and direct current machines Skills for conducting practical tests of -D7

to measure the efficiency of the electrical machine so that he can choose the type of machine required that is appropriate for the required work Skills -D8

12. Course development plan

- Participation in various courses related to the subject
- See the latest findings of modern technology in this article
- Preparing courses that develop the capabilities of laboratory trainers so that they can train students more efficiently
- ies with modern equipment that Providing laborator keeps pace with scientific development in developed countries

Source The Internet different	ب - References ،electronic Locations The Internet ....

	department/center
Electrical machines	3. Course name/code
Section	4. Programs in which it is included
Mandatory daily attendance	5. Available attendance forms
Academic year 2023/2024	6. Semester/year
theoretical + 3 practical = 5 * 30 weeks = 150 2 hours annually	7. Number of study hours (total)
2024/20/4	8. Date this description was prepared

Electrical networks

13. Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Editorial + practical	Lectures + practical	Calculating the magnetomotive -Magnetic circuits Similarities between magnetic circuits and -force electrical circuits	Theoretical + practical	5	the first
Editorial + practical	Lectures + practical	-The basic principles of direct current machines -magnetic poles) -the main parts of the machines .the external structure -the product	Theoretical + practical	5	the second
Editorial + practical	Lectures + practical	-self -Types of DC machines: separate feeding (compound -series -feeding (parallel -losses -Efficiency of direct current machines fixed losses and variable losses) -types of losses) stages of power distribution in direct current giving mathematical examples of how -machines to calculate efficiency and losses	Theoretical + practical	5	the third
Editorial + practical	Lectures + practical	factors affecting the -Electromotive force giving mathematical -electromotive force examples of how to calculate the electromotive .force for all types of generators	Theoretical + practical	5	the fourth
Editorial + practical	Lectures + practical	load curve) -Study of the magnetization curve (no and how to find the critical resistance and critical speed on the magnetization curve. Examples of how to calculate the electromotive force, critical resistance, and critical speed for direct current .smachine	Theoretical + practical	5	Fifth
Editorial + practical	Lectures + practical	Study the load characteristics of all types of direct current machines, draw their curves, and study .voltage regulation for different types of generators	Theoretical + practical	5	VI
Editorial + practical	Lectures + practical	DC motors reverse electromotive force -Motor theory -Reverse electromotive force equation comparison between DC motors and generators	Theoretical + practical	5	Seventh
Editorial + practical	Lectures + practical	Torque on the -Torque on the product -Torque) drive shaftShaft (Power distribution in DC motors The state of the greatest electromagnetic power in DC motors	Theoretical + practical	5	VIII
Editorial + practical	Lectures + practical	General characteristics of speed and torque of (series combination -engines (parallel mathematical examples -Speed regulation rate Comparison of DC motors in various industrial uses	Theoretical + practical	5	Ninth
Edito	Lectur	Speed control of DC machines	Theo	5	The

rial + practical	es + practical	Control by product -Domain Control (Control by product voltage (Ward Leonard	retical + practical		tenth
Editorial + practical	Lectures + practical	-Swinburne test -Motor testing (suspension test mathematical -Hopkinson test, decrement test (mathematical examples -examples	Theoretical + practical	5	eleventh
Editorial + practical	Lectures + practical	Electrical transformers/ components and parts of the transformer, operating theory, transformer with an inner core- transformer with an outer core- electromotive force equation- vector drawing- equivalent circuit of the transformer	Theoretical + practical	5	twelveth
Editorial + practical	Lectures + practical	Open and short circuit test– how to calculate the value Equivalent circuit components- load state transformer- diagram Phase transformer in load condition- losses- calculation of efficiency condition Maximum efficiency- miscellaneous issues	Theoretical + practical	5	Thirteenth
Editorial + practical	Lectures + practical	Autotransformer- Issues Current transformer- voltage transformer- practical uses	Theoretical + practical	5	fourteenth
Editorial + practical	Lectures + practical	phase transformers-Three *phase -Different methods of connecting three transformers. Issues*	Theoretical + practical	5	Fifteenth
Editorial + practical	Lectures + practical	phase induction motors-Three Advantages- Disadvantages- Rotating magnetic field- Theory Operating slip– frequency of the rotor	Theoretical + practical	5	sixteen
Editorial + practical	Lectures + practical	Types of engines Slip ring engines -Squirrel cage engines Comparison between them- composition of each type- uses of each type	Theoretical + practical	5	seventeenth
Editorial + practical	Lectures + practical	Methods for controlling the start of induction motors are delta switch, -direct operation, operation by a star operation by an autotransformer, operation by .connecting resistors in series with the rotating part	Theoretical + practical	5	eighteen
Editorial + practical	Lectures + practical	The relationship between torque and power coefficient- The relationship between torque and slip Starting torque- maximum condition Starting torque- torque- Maximum torque condition- the equivalent circuit for an induction motor- mathematical examples	Theoretical + practical	5	nineteenth

Editorial + practical	Lectures + practical	phase induction motors-Reversals, rotation, three - methods Stopping induction motors- controlling induction motors using Source voltage- number of poles- source frequency- placement of resistance in the rotating circuit Running two engines in series	Theoretical + practical	5	The twentieth
Editorial + practical	Lectures + practical	phase induction motors-Single- their types- installation, theory of operation- how to obtain initial torque phase -A detailed explanation of the types of single induction motors -1 phase induction motor-Split-2 Induction motor with starting capacity 3. Induction motor with start androtation capacity. 4. oleInduction motor with shaded p -5 repulsive motor 6 General motor reverse rotation direction for each type	Theoretical + practical	5	st21
Editorial + practical	Lectures + practical	Synchronous generators, their installation- working principles- types of generators in relation to the rotor, step coefficient- distribution coefficient Equating the electromotive force in the case of a inductive -load (resistive - capacitive) and drawing phase diagrams for each load. Voltage regulation rate- laneous issuesmiscel	Theoretical + practical	5	twenty tow
Editorial + practical	Lectures + practical	Comparison between direct current generators and alternating current generators Reasons for making the product in synchronous generators constant Run generators in parallel Reasons and conditions for operating synchronous generators in parallel Explanation of the synchronization process- voltage regulation rate Miscellaneous issues	Theoretical + practical	5	twenty third
Editorial + practical	Lectures + practical	Synchronous motors- installation and working principles of synchronous motors Starting up in synchronous motors- Synchronous motor under load Phase diagram in the case of unit power factor- advanced power factor- lagging power factor Calculate the value of the reverse electromotive force	Theoretical + practical	5	twenty fourth
Editorial + practical	Lectures + practical	Practical uses- speed regulation rate Shraga engine- installation- work theory- speed regulation General review about alternating current motors	Theoretical + practical	5	th25
Editorial + practical	Lectures + practical	its structure, properties and uses –General motor its structure, theory of operation, -Repulsive motor properties and uses	Theoretical + practical	5	twenty sixth-
Editorial + pract	Lectures + practic	theory -composition -their types -Control motors conditions that must be met in -of operation their properties -control motors	Theoretical +	5	th27

		13Structure Infrastructure			
Broc					ied
the c					
And development Administrative - Baghdad					
Encyclopedia Security /National University Countries Arabic		2- References Home (Sources)			
pract ical	2- practic al 3-	Operates electrical machines .Identifies parts of electrical machines and transformers	l + practi		eighth
		The student will be able to conduct practical tests of alternating and direct current machines and measure efficiency so that he can choose the type of required work machine required that is appropriate for the			
Edito rial + pract ical	Lectur es + practic al	types of tachometers and Tacho generators to calibrate tachometers	Theo retica l + practi cal	5	XXIX
Edito rial + pract ical	Lectur es + practic al	induction -types of linear motors -Linear motors problems that appear with linear -linear motors motors	Theo retica l + practi cal	5	thirty

Awsat Technical -Furat Al-Al Central -University/Technical Institute	1. Educational institution
Second Grade -Electrical Techniques	2. Scientific department/center
Electrical networks	3. Course name/code
Section	4. Programs in which it is included
Mandatory daily attendance	5. Available attendance forms
Academic year 2023/2024	6. Semester/year
theoretical + 2 practical = 4 * 30 weeks = 120 2 hours annually	7. Number of study hours (total)
2024/20/4	8. Date this description was prepared
9. Course objectives	
Introducing the student to the parts and operation of the electrical system	
Introducing the student to methods of generating electrical energy	
Introducing the student to how to transmit electrical energy	
Introducing the student to how electrical energy is distributed	
Introducing the student to methods of maintaining the electrical system	
ways to improve the power factor Introducing the student to	
Introducing the student to the principles of protection, their definition and various	

14. Infrastructure	
Electrical machines written by Dr. Muhammad Zaki Muhammad Khadr/University of Mosul Methodological fascicle (book (project Text book of electrical technology by BL Theraga	Required -1 prescribed books
Electrical machines written by -Sultan Hussein and Muhammad Al Sayyid Ragheb	Main -2 references (sources)
Electrical machine direct and alternating current by siskind	Recommended books and references scientific) journals, (...،reports
Various internet sources	-B Electronic references, Internet ...sites

on relays, separations and circuit breakers in the components, and the uses of protecti .electrical power system and measuring devices

10.Course outcomes and teaching, learning and evaluation methods
Cognitive objectives -A Introducing the student to methods of generating electrical energy -A1 Introducing the student to methods of transmitting and distributing electrical energy -A2 Introducing the student to ways to improve the power factor -A3 Introducing the student to how to protect transmission lines -A4 Introducing the student to pneumatic lines and their mechanical calculations -A5 Introducing the student to the insulators of overhead transmission lines, their types, -A6 shapes, composition, the phenomenon of discharge, its causes, and the methods used to get .rid of it Training the student to draw the load curve -A7
.objectives of the course The skills -B Conduct practical experiments that verify the theoretical aspect -B1 Acquire the skill of identifying faults in ground cables -B2 Acquire the skill of finding the short circuit current of a network -B3 Acquire the skill of testing the breakdown voltage of a sample of transformer oil -B4 Acquire skill in protecting transmission lines against overload and short circuit -B5 lated or Acquire skill in identifying ground faults in power transmission lines when insu -B6 not
Teaching and learning methods
Theoretical lectures + laboratory experiments + use and contact with measuring devices scientific films + field visits +
Evaluation methods
Written + practical + oral + discussion
Emotional and value goals -C (Homework (student exercises -C1 Theoretical lectures -C2 Applied skills within the laboratory -C3 Class discussion -C4
Teaching and learning methods
Lectures + practical + scientific films + discussion + scientific visits to various electrical power stations
Evaluation methods
Written + practical + oral + discussion

Transferable general and qualifying skills (other skills related to employability -D .(and personal development

Applied skills within laboratories, workshops and laboratories -D1
Scientific films -D2
Scientific visits -D3
for conducting practical experiments that achieve the theoretical aspect Skills -D4
Fault identification skills for ground cables -D5
in finding the short circuit current for a network Skills -D6
r oilfor testing the breakdown voltage of a sample of transforme Skills -D7
Skills in protecting transmission lines against overload and short circuits -D8
Skills in identifying ground faults in power transmission lines when isolated or not -D9

11.Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Editorial + practical	Lectures + practical	How to generate electrical energy, energy development, electrical power system in generation and even consumption, standard voltages	Theoretical + practical	5	the first second
Editorial + practical	Lectures + practical	Hydropower and thermal power plants	Theoretical + practical	5	the third
Editorial + practical	Lectures + practical	Gas generation stations and an idea about some other stations such as diesel	Theoretical + practical	5	the fourth
Editorial + practical	Lectures + practical	) Vertical barsBB system and diagrams for (transformer stations inside and outside buildings	Theoretical + practical	5	Fifth
Editorial + practical	Lectures + practical	Overhead lines, their uses, dividing lines into short, medium and long	Theoretical + practical	5	VI
Editorial + practical	Lectures + practical	:mechanical calculations, including -Overhead lines Calculating tension and relaxation when the - dimensions from the ground are equal Calculate the weight of snow accumulated - .on the wire Calculate the amount of wind pressure - affecting the wire	Theoretical + practical	5	Seventh
Editorial + practical	Lectures + practical	-Calculations of the basic elements of overhead lines :electrical calculations, including Resistance calculation - Calculate the internal and external - inductance of a single wire Calculating the inductance of a triple system - consisting of three wires spaced apart Equal distances apart from each other, or at different distances, or interchanged in location	Theoretical + practical	5	VIII
Editorial + practical	Lectures + practical	Calculating the capacitance of the single and triple - system consisting of three wires far apart Equal distances apart from each other, or at different distances and interchangeable in location	Theoretical + practical	5	Ninth
Editorial + practical	Lectures + practical	Solve various problems for the seventh and eighth weeks	Theoretical + practical	5	The tenth
Editorial + practical	Lectures + practical	Solving short lines includes representing them as an electrical circuit and calculating its efficiency Solve the intermediate lines and divide into Represented as an electrical circuit in the - shape of the letterT it in the Representing it as an electrical circu - shape of the letterR	Theoretical + practical	5	eleventh
Editorial + practical	Lectures + practical	Insulators for overhead transmission lines, their types, shapes, installation, the discharge phenomenon, its causes, and methods used to get rid	Theoretical + practical	5	twelveth

		.of it			
Editorial + practical	Lectures + practical	range -division -their components -Ground cables of cables	Theoretical + practical	5	Thirteenth
Editorial + practical	Lectures + practical	Calculating capacitance and inductance for single and pole grounded leads-three	Theoretical + practical	5	fourteenth
Editorial + practical	Lectures + practical	Voltage gradient in conductors, calculation of loss and angle in insulators, breakdown of conductors	Theoretical + practical	5	Fifteenth
Editorial + practical	Lectures + practical	types -their components -High voltage cables	Theoretical + practical	5	sixteen
Editorial + practical	Lectures + practical	Distribution networks and direct current distributors which are fed from two -that are fed from one end .ends AC distributors that feed from one end	Theoretical + practical	5	seventeenth
Editorial + practical	Lectures + practical	a comparison between -Ring distributors of all kinds different distributors	Theoretical + practical	5	eighteen
Editorial + practical	Lectures + practical	Solve various examples from the sixteenth and seventeenth weeks	Theoretical + practical	5	ninetenth
Editorial + practical	Lectures + practical	Stability conditions for the operation of synchronous load capacity curve -generators with the network How do synchronous generators work in parallel with each other and with the network	Theoretical + practical	5	The twentieth
Editorial + practical	Lectures + practical	:Methods for improving power factor are divided into phase -synchronous motors -Static capacitors - advance devices	Theoretical + practical	5	st21
Editorial + practical	Lectures + practical	Types of errors in electrical networks and their :division into Symmetric errors and calculating the fault - current in the electrical circuit similar faults and calculating the fault -Non - current in the electrical circuit) Calculating basic units -PU (	Theoretical + practical	5	twenty tow
Editorial + practical	Lectures + practical	Principles of protection, their definition, various components, and uses of protection and separation relays and circuit breakers in the electrical power :system and measuring devices, including Current -Voltage measuring transformers - mersmeasuring transfor	Theoretical + practical	5	twenty third
Editorial + practical	Lectures + practical	Relays, divided according to their theory of operation, inductive relays against surge current, against power reversal, electronic relays	Theoretical + practical	5	twenty fourth
Editorial + practical	Lectures + practical	How to protect overhead transmission lines Distance protection (line impedance -) Bar protection -measurement protection) BB (	Theoretical + practical	5	th25
Editorial + practical	Lectures + practical	How to protect power transformers usingDifferential Protection	Theoretical + practical	5	twenty sixth-
Editorial +	Lectures +	:How to protect synchronous generators using -Differential Protection	Theoretical +	5	th27

practical	practical	Digital-Protection -Reverse Power Protection	practical		
Editorial + practical	Lectures + practical	Protection of the stator when the current increases, and protection of the rotor	Theoretical + practical	5	Twent-y eighth
Editorial + practical	Lectures + practical	Percentage Reactance	Theoretical + practical	5	XXIX
Editorial + practical	Lectures + practical	Power circuit diagram at the receiving side	Theoretical + practical	5	thirty

					n
Editorial	Lectures	Litigation Oh Grievance Not Judicial	Look	2	Fifth And the tenth n
Editorial	Lectures	Appeal Judicial ، Select Responsibility The state About Its work legitimacy	Look	2	Sixth And the tenth n
Editorial	Lectures	Impact Duplicity Judiciary On Freedoms Public Freedoms Public Accordingly Jurisprudence Administrative	Look	2	Severt h And the tenth n
Editorial	Lectures	Equality : Development Historical For an understanding Equality	Look	2	Eighth And the tenth n
Editorial	Lectures	Development Modern For an idea Equality	Look	2	Ninth And the tenth n
Editorial	Lectures	Equality Between Both sexes Equality Between Individuals According to Their beliefs And their element	Look	2	Thirty

12 Infrastructure	
Theoretical booklet for electrical networks prepared	Required -1 prescribed

13.Course development plan

- Participation in various courses related to the subject

-Middle Euphrates University/Technical Institute Samawa	1. Educational institution pabilities of laboratory
Second Grade -Electrical Techniques	2. Scientific department/center
Electronic capacity	3. Course name/code
Section	4. Programs in which it is included
Mandatory daily attendance	5. Available attendance forms

distribution by and GC Garg electrical fundamentals CNSC technical training group	references books and references scientific) journals, (...reports
Various internet sources	Electronic -B ...Internet sites

Introducing the student to the electronic components used in power electronics

2024/20/4	.80Date Preparation This Description
	.81Objectives The decision

Electron ic capacity

Academic year2 /2023 202	6. Semester/year
theoretical + 3 practical = 5 * 30 weeks = 150 2 hours annually	7. Number of study hours (total)
2024/20/4	8. Date this description was prepared

The goal The year And the private : Submission A picture Clear And comprehensive About Safety Professionalism And methods Protection To prevent It happened Accidents During Work And reduce it

9. Course objectives
General objective: To familiarize the student with the electronic components used in power .electronics
Specific Objective: The student will be able to become familiar with: the electronic components manufactured from semiconductors and used in power electronics, and will be .able to analyze the electronic circuits of power electronics systems
:The student will be able to 1. Uses the basic electronic devices found in the laboratory 2. Connects electronic switches in power electronic circuits 3. Knowing the specifications and features of systems for converting electrical power from one form to another 4. ntify applied circuits for power electronics systemsIde

10.Course outcomes and teaching, learning and evaluation methods
Cognitive objectives -A the different electronic keys to Introducing the student -A1 Introducing the student to power electronics systems -A2 Introducing the student to how to build power electronics systems -A3 Introducing the student to the analysis of electronic circuits and their applications -A4 c electronic devices in the laboratoryIntroducing the student to the basi -A5 Training the student to connect electronic elements in circuits and power electronics -A6 systems Introducing the student to the specifications and features of power electronics systems -A7 Introducing the student to the different circles of protection -A8
.The skills objectives of the course -B Conduct practical experiments that verify the theoretical aspect -B1 the skill of using electronic switches in building power electronics systems Acquiring -B2 Acquiring the skill of analyzing power electronics circuits -B3 Acquiring the skill of designing power electronics systems -B4 pplied circuits for some systemsAcquiring the skill of designing and building a -B5
Teaching and learning methods
Theoretical lectures + laboratory experiments + use and contact with measuring devices scientific films +
Evaluation methods
Written + practical + oral + discussion
Emotional and value goals -C (Homework (student exercises -C1 Theoretical lectures -C2 Applied skills within the laboratory -C3 Class discussion -C4
Teaching and learning methods
Lectures + practical + scientific films + discussion
Evaluation methods

Written + practical + oral + discussion
General and qualifying transferable skills (other skills related to employability -D .(and personal development Applied skills within laboratories, workshops and laboratories -D1 Scientific films -D2 Scientific visits -D3 Skills in using electronic switches in power electronics circuits -D4 Skills in analyzing electronic circuits and their applications -D5 Skills in designing and implementing applied circuits for some components -D6 Skills for conducting practical experiments that achieve the theoretical aspect -D7

11.Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Editorial + practical	Lectures + practical	Power electronic, electronic components which used in high power control (power diodes, thyristor and power transistors) pevison of single phase rectifier circuites by using diodes.	Theoretical + practical	5	the first
Editorial + practical	Lectures + practical	Three phase rectifier circuites by using diodes, output voltage waveform, diode current waveform, output voltage equation in case of resistance lode.	Theoretical + practical	5	the second
Editorial + practical	Lectures + practical	Using the transistor as switch, regions of operation, transistor as a switch (cut off and saturation)	Theoretical + practical	5	the third
Editorial + practical	Lectures + practical	Power transistor in (off)and (on)state, improvement of(off)and(on)time by usenig speed up capacitance, practical problems.	Theoretical + practical	5	the fourth
Editorial + practical	Lectures + practical	Uniplolor junction transistor, construction, theoretical operation, using the transistor as relaxation oscillator practical example	Theoretical + practical	5	Fifth
Editorial + practical	Lectures + practical	operational amplifier, description of operational amplifier (op-amp) as asparate components, zero detector, comparator	Theoretical + practical	5	VI
Editorial + practical	Lectures + practical	The use of op-amp as stablemultivibrator and a monostablemultivibrator, photo conduction cells, photo diodes	Theoretical + practical	5	Seventh
Editorial + practical	Lectures + practical	Light – emitting diodes (LED), photo transistors, the use of optical comparator in power electronic circuits	Theoretical + practical	5	VIII
Editorial + practical	Lectures + practical	Thyristor, construction, characteristic, curves for a thyristor, thyristor conduction in forward biasing, thyristor family, thyristor representation as a double transistor circuit.	Theoretical + practical	5	Ninth
Editorial + practical	Lectures + practical	Thyristor conduction methods , conduction throw the gate minimum gate current causing conduction , conduction time , conduction due to high forward voltage rectifire (dv/dt)	Theoretical + practical	5	The tenth
Editorial + practical	Lectures + practical	DIAC, TRIAC characteristics, practical applications, thyristor, triggering methods, triggering on DC and AC current, pluse triggering types	Theoretical + practical	5	eleventh
Editorial + practical	Lectures + practical	thyristor triggering circuit, DC and AC triggering circuits	Theoretical + practical	5	twelveth
Editorial + practical	Lectures + practical	Pluse current triggering circuit, relaxation oscillator, zero detector, comparator with stable and monostable multivibrators(operational amplifiers and timer)	Theoretical + practical	5	Thirteenth
Editorial +	ctures Le +	Thyristor general application introductory, AC to DC inverter DC to AC inverter, DC to DC inverter, AC	Theoretical +	5	fourteenth

practical	practical	to AC inverter, phase controlled halfwave rectifire with resistance and indctormce load out put current and voltage waveform, output voltage equations	practical		
Editorial + practical	Lectures + practical	Half controller full wave rectifire fully controlled, resistance and inductance load, generated wave forms, out put voltage equation for free wheeling diode.	Theoreti cal + practical	5	Fifteen th
Editorial + practical	Lectures + practical	Regenrating fully controlled inverters, examples, DC motor speed control	Theoreti cal + practical	5	sixteen
Editorial + practical	Lectures + practical	Three face inverters, out put voltage wave form with triggering pulses and equations	Theoreti cal + practical	5	sevent eenth
Editorial + practical	Lectures + practical	Thyristor protection from the high rate change in current and voltage, protection from the transient change in source voltage, fully protection circuit from all possible faults due to current and voltage.	Theoreti cal + practical	5	eightee n
Editorial + practical	Lectures + practical	DC to AC inverters methods of forcing the thyristor to get off	Theoreti cal + practical	5	ninetee nth
Editorial + practical	Lectures + practical	Parallel and older inverter, single and three phase, control methods in charging frequency and voltage, out put wave forms1	Theoreti cal + practical	5	The twentie th
Editorial + practical	Lectures + practical	Inverter application, emergency power supply, single phase DC motor speed control	Theoreti cal + practical	5	st21
Editorial + practical	Lectures + practical	Three phase motor control by using a constant ratio of variation frequency and voltage	Theoreti cal + practical	5	twenty tow
Editorial + practical	Lectures + practical	Choppers, DC to DC inverter frequency constant, line constant	Theoreti cal + practical	5	twenty third
Editorial + practical	Lectures + practical	Types of choppers, DC motor speed control	Theoreti cal + practical	5	twenty fourth
Editorial + practical	Lectures + practical	AC to AC inverter, single phase voltage regulator, three phase voltage regulator	Theoreti cal + practical	5	th25
Editorial + practical	Lectures + practical	General application on single and three induction motor speed control due to the change in stat or voltage, using the closed loop feedback circuit to control the slippery rings of AC motor	Theoreti cal + practical	5	twenty sixth-
Editorial + practical	Lectures + practical	Cyclic inverter, AC to DC cyclic inverter, DC to DC cyclic inverter	Theoreti cal + practical	5	th27
Editorial + practical	Lectures + practical	AC to AC cyclic inverter control block diagram	Theoreti cal + practical	5	Twent -y eighth
Editorial + practical	Lectures + practical	Using amplitude modulation for speed control	Theoreti cal + practical	5	XXIX
Editorial +	Lectures +	Using polar transistor for AC motor speed control	Theoreti cal +	5	thirty

practical	practical		practical		

12.Infrastructure	
• Laboratory chair • Power Electronics, written by Diaa Dahi and Youssef Ibrahim	Required prescribed books -1
• Electronics in the Service of Electrical Applications Translated by Dr. Samir Rostom	(Main references (sources -2
• Advanced industrial electronics by morris • Thyristor engineering by BB berde • Power Electronics (Written by Dr. Muzaffar (Naama-Anwar Al	Recommended books and references (scientific journals, (...،reports
Various internet sources	Electronic references, -B ...Internet sites

13.Course development plan
• Participation in various courses related to the subject • See the latest findings of modern technology in this article • Preparing courses that develop the capabilities of laboratory trainers so that they can train students more efficiently • Providing laboratories with modern equipment that keeps pace with c development in developed countriesscientifi

Laboratory workshops/2

various electrical maintenance works Training the student on

-Middle Euphrates University/Technical Institute Samawa	1. Educational institution
Second Grade -Electrical Techniques	2. Scientific department/center
Laboratory workshops/2	3. Course name/code
Section	4. Programs in which it is included
Mandatory daily attendance	5. Available attendance forms
Academic year2 /2023 202	6. Semester/year
My work = 4 * 30 weeks = 120 hours annually 4	7. Number of study hours (total)
2024/20/4	8. Date this description was prepared

9. Course objectives

:The student will be able to

1- Dismantles and assembles electrical machine parts
2- Inspects electrical machines after wrapping them
3- Distinguishes between electrical machines and makes the best choice

:The student will also be able to

1. Uses the various devices, tools, and components used in workshops
2. Acquires technical skill and experience in the field of various electrical maintenance works
3. confidence to practice electrical technician work in tracking faults -He gains self and learning how to repair them
4. electronic components and how to Distinguish and identify various electrical and use them in building different circuits

10.Course outcomes and teaching, learning and evaluation methods
Cognitive objectives -A various electrical maintenance tasks the student on Training -A1 electrical technical work in tracking faults and learning how Introducing the student to -A2 to repair them to the various electrical and electronic components and how to Introducing the student -A3 use them in building various circuits student to how to disassemble and install electrical machine parts Introducing the -A4 Introducing the student to how to inspect electrical machines after winding them -A5 between electrical machines and make a distinguish Introducing the student to how to -A6 good choice
.The skills objectives of the course -B methods of rewinding direct -Acquiring the skill of installing direct current machines -B1 current machines phase transformers-Acquire the skill of designing and studying three -B2 cage -phase, squirrel-Acquiring the skill of rewinding the stator windings of a three -B3 induction motor Acquire the skill of assembling the engine and testing the engine under the load -B4 assigned to it phase motor, conduct the necessary -split Acquire the skill of regular maintenance of a -B5 .tests on it, and identify faults and methods for treating them pole motor of various types-Acquiring the skill of winding a shaded -B6 tests on it Acquire the skill of winding a capacitor motor and performing the necessary -B7 Acquiring the skill of maintaining home appliances (such as the home freezer and - -B8 (home air conditioner
Teaching and learning methods
Theoretical lectures + laboratory experiments + use and contact with measuring devices scientific films +
Evaluation methods
Written + practical + oral + discussion
Emotional and value goals -C (Homework (student exercises -C1 Theoretical lectures -C2 Applied skills within the laboratory -C3 Class discussion -C4
Teaching and learning methods
Lectures + practical + scientific films + discussion

Evaluation methods
Written + practical + oral + discussion
Transferable general and qualifying skills (other skills related to employability -D .(and personal development Applied skills within laboratories, workshops and laboratories -D1 Scientific films -D2 Scientific visits -D3 Skills in using various electrical components -D4 Skills in repairing various home appliances -D5 Skills in tracking faults and repairing them -D6 Various electrical maintenance skills -D7 heoretical aspectSkills for conducting practical experiments that achieve the t -D8

11.Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
practical	Lectures + practical	methods for -Installing direct current machines detailed -rewinding direct current machines drawing	practical	4	the first
practical	Lectures + practical	Installing -How to clean the surface of the units Application mode of the -the carbon brushes carbon brushes	practical	4	the second
practical	Lectures + practical	Contact, disconnection and insulation testing	practical	4	the third
practical	Lectures + practical	Armature windings for a direct current generator winding -preparing and collecting information - the armature winding and installing the windings simplified examples of -on the iron core ducts winding	practical	4	the fourth
practical	Lectures + practical	connecting the -drying -Insulation with varnish final selection of the production -final ends a complete drawing of the production -member member with all its files, connections and uses	practical	4	Fifth
lpractica	Lectures + practical	collecting information for parallel and -Field coils -forming conductors of large cross -series coils properties of series and parallel field coils -section and methods of connecting them to the machine. .Rolling on the mold	practical	4	VI
practical	Lectures + practical	complete -Making coils and installing single poles -electrical transformer -testing of the machine preparing and cutting the iron core sheets and winding the coils and insulating -assembling them them with varnish and training on making a simplifiedtemplate before winding	practical	4	Seventh & Eighth
practical	Lectures + practical	polarity test -Connecting and connecting the ends contract test and insulation test -continuity test - in the coils. Examples of designing and rewinding a small power transformer	practical	4	Ninth
practical	Lectures + practical	simple design -phase transformers -Study of three and detailed drawing	practical	4	The tenth
practical	Lectures + practical	Preparing, cutting and assembling iron core sheets -fixing and insulating with varnish -coil winding - drying	practical	4	eleventh
practical	Lectures + practical	-earth leakage test -continuity test -Polarity test insulation test and measurement -short coil test	practical	4	twelveth
practical	Lectures + practical	Induction motors: Rewinding the stator coils of a -phase, squirrel cage induction motor -three alculating and drawing the general shape of the C coils, removing insulating materials and cleaning Winding -Insulating the stator ducts -the ducts and shaping the coils, then installing them on the .ducts	practical	4	Thirteenth

practical	Lectures + practical	**Winding and connecting the ends of the coils and testing continuity**	practical	4	The tenth quarter
practical	Lectures + practical	**choosing insulation -Choosing nodes in the coils choosing the engine's ground -and measuring it leakage**		4	Fifteenth
practical	Lectures + practical	**Assembling the motor and testing the motor at the studying the starting phase of -load assigned to it -the self -the direct method -phase motors -three motor method**		4	sixteen seventeenth
practical	Lectures + practical	**Induction motor protection devices and use of timers**		4	eighteen
practical	Lectures + practical	**Change the final drive connection to the ends from a star to a triangle The motor is originally runningY -Δand note the differences in current and torque in both cases**		4	nineteenth
practical	Lectures + practical	**phase induction motor, practical study of -Single -phase induction motors -different types of single -split -capacitor motor -installation of motors phase motor**		4	The twentieth
practical	Lectures + practical	**phase motor and conducting the -Winding a split necessary tests on it and methods of periodic faults and methods of treating them -maintenance reversing the direction of rotation of the motor -**		4	st21
practical	Lectures + practical	**-phase motor -Drawing windings for a split multiple examples**		4	twenty tow
practical	Lectures + practical	**Different types of shaded pole motor winding**		4	twenty third
practical	Lectures + practical	**ground contact test -polarity test -Continuity test short circuit test -**		4	twenty fourth
practical	Lectures + practical	**Electrical and mechanical faults and methods of treating them**		4	th25
practical	Lectures + practical	**Winding the motor with a capacitor, conducting -polar continuity test -the necessary tests on it short circuit between the coils -ground contact**		4	-twenty sixth
practical	Lectures + practical	**Wind the ceiling and table fan motor and conduct the necessary tests**		4	th27
practical	Lectures + practical	**home -Maintenance of home appliances mechanical and electrical faults and -refrigerator methods of treating them**		4	-Twenty eighth
practical	Lectures + practical	**-home freezer -Home appliance maintenance mechanical and electrical -home air conditioner periodic -faults and methods of treating them maintenance**		4	XXIX
practical	Lectures + practical	**electric -Maintenance of home appliances electrical faults and methods of -washing machine periodic maintenance -treating them**		4	thirty

12.Infrastructure	
Methodical books	Required prescribed books -1
	(Main references (sources -2
Scientific books from libraries	Recommended books and references (scientific journals, (...،reports
Various internet sources	Electronic references, -B ...Internet sites

13.Course development plan
• Participation in various courses related to the subject • See the latest findings of modern technology in this article • Preparing courses that develop the capabilities of laboratory trainers so that they can train students more efficiently • ies with modern equipment that keeps pace with scientific Providing laborator development in developed countries

Industrial establishments

Introducing the student to the various industrial establishment systems

-Middle Euphrates University/Technical Institute Samawa	1. Educational institution
Second Grade -Electrical Techniques	2. Scientific department/center
Industrial establishments	3. Course name/code
Section	4. Programs in which it is included
Mandatory daily attendance	5. Available attendance forms
Academic year2 /2023 202	6. Semester/year
theoretical + 2 practical = 4 * 30 weeks = 120 2 hours annually	7. Number of study hours (total)
2024/20/4	8. Date this description was prepared
9. Course objectives	
General objective: To introduce the student to the various industrial .establishment systems	
Specific Objective: The student will be able to identify the electrical materials and wiring systems used in laboratories and factories, ctrical machines, and methods of controlling establish and install ele .and protecting various loads during the establishment	
The student will be able to gain practical knowledge of industrial establishments, in addition to how to establish and install electrical .machines	

10.Course outcomes and teaching, learning and evaluation methods
Cognitive objectives -A the various industrial establishment systems to Introducing the student -A1 Introducing the student to the electrical materials used in industrial establishments -A2 Introducing the student to the wiring systems used in laboratories and factories -A3 Introducing the student to the methods of establishing and installing electrical machines -A4 oads in the Introducing the student to methods of control and protection of various l -A5 foundation Practical training for the student in industrial facilities, in addition to how to establish -A6 .and install electrical machines
.The skills objectives of the course -B Conduct practical experiments that verify the theoretical aspect -B1 skill in various industrial establishments Acquiring -B2 Acquiring the wiring skill used in laboratories and factories -B3 al machinesAcquire the skill of establishing and installing electric -B4 Acquire the skill of designing and implementing methods of control and protection for -B5 various loads in the foundation
Teaching and learning methods
Theoretical lectures + laboratory experiments + use and contact with measuring devices scientific films +
Evaluation methods
Written + practical + oral + discussion
Emotional and value goals -C (Homework (student exercises -C1 Theoretical lectures -C2 Applied skills within the laboratory -C3 Class discussion -C4
Teaching and learning methods
Lectures + practical + scientific films + discussion
Evaluation methods
Written + practical + oral + discussion

Transferable general and qualifying skills (other skills related to employability -D .(and personal development

Applied skills within laboratories, workshops and laboratories -D1
Scientific films -D2
Scientific visits -D3
Skills in designing and implementing methods of control and protection for various -D4 loads in the foundation
Skills in various industrial establishments -D5
Wiping skills used in laboratories and factories -D6
electrical machines Skills for establishing and installing -D7

11.Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Editorial + practical	Lectures + practical	cable components and operating voltage, -Cables) types of cables according to the type of insulation MIMPVCTRSVRI and paper cables with a lead (.sheath	Theoretical + practical	4	the first
Editorial + practical	Lectures + practical	Methods of laying cables, faults that may occur in cables, how to determine the type and location of .the fault	Theoretical + practical	4	the second
Editorial + practical	Lectures + practical	Protection of electric motors, protection against overcurrents due to short circuits	Theoretical + practical	4	the third
Editorial + practical	Lectures + practical	Protection against overcurrents due to increased loads	Theoretical + practical	4	the fourth
Editorial + practical	Lectures + practical	Protection against the disappearance or fall of one of the phases and protection against voltage drops	Theoretical + practical	4	Fifth
Editorial + practical	Lectures + practical	Electrical circuit breakers, their types (oil, sulfur hexafluoride breakers, vacuum breakers, (pneumatic pressure breakers	Theoretical + practical	4	VI
Editorial + practical	Lectures + practical	Substations, vertical bars, pneumatic pressure switchboard Classification of control panels for variable current	Theoretical + practical	4	Seventh
Editorial + practical	Lectures + practical	Lighting, foundations of optical engineering, light sources, lighting systems and their types, light measuring devices	Theoretical + practical	4	VIII
Editorial + practical	Lectures + practical	Solved questions about how to design and calculate electrical lighting for halls, workshops, and courtyards	Theoretical + practical	4	Ninth
Editorial + practical	Lectures + practical	The grounded system and the insulated system, a comparison between them in the event of a fault, the equality and advantages of each system	Theoretical + practical	4	The tenth
Editorial + practical	Lectures + practical	phase feeders, -and three -Voltage drop in single the meaning of voltage drop, causes of voltage drop, damage resulting from voltage drop, testing feeder sizes (cables), factors on which current rates .depend	Theoretical + practical	4	eleventh
Editorial + practical	Lectures + practical	Solved questions on voltage drop calculations	Theoretical + practical	4	twelveth
Editorial + practical	Lectures + practical	Technical methods of massage, study of the massage system, methods of massage, and methods used for that	Theoretical + practical	4	Thirteenth
Editorial + practical	Lectures + practical	Establishing dangerous places (examples of dangerous places) Specifics of establishing dangerous places and the steps that must be taken for that	Theoretical + practical	4	fourteenth

Editorial + practical	Lectures + practical	Grounding, its types, installation of ground conductors for substations and buildings, and .lightning rods	Theoretical + practical	4	Fifteenth
Editorial + practical	Lectures + practical	Definition of electrical energy expenditures (pricing), fixed and variable costs. Energy expenditure calculation systems and various types of pricing systems	Theoretical + practical	4	sixteen
Editorial + practical	Lectures + practical	phase energy meter, its internal -Energy meters, three components and errors that occur in it, methods of connecting the meter, a power factor measuring .device, its components and theory of operation	Theoretical + practical	4	seventeenth
Editorial + practical	Lectures + practical	Power factor, the importance of improving power factor, ways to improve power factor, solved examples of how to calculate power factor	Theoretical + practical	4	eighteen
Editorial + practical	Lectures + practical	Electric heating, general methods of heat transfer, methods of heat transfer, types of heaters, leakage through walls, heat transfer coefficient of materials, thermal insulation, points to be taken into account .when calculating spaces and rooms	Theoretical + practical	4	nineteenth
Editorial + practical	Lectures + practical	Solved examples of heating calculations	Theoretical + practical	4	The twentieth
Editorial + practical	Lectures + practical	Electric elevators, choosing the location of the elevator, choosing its type, and the tests that must be followed when choosing an elevator for a specific service (capacity, required specifications, speed), type calculating travel time, elevator efficiency and of service	Theoretical + practical	4	st21
Editorial + practical	Lectures + practical	Types of elevators (personnel, goods and service elevators), the main components of any elevator driver or rotator, motor, stops, carriage, balance) .load, indicators, controls), safety means	Theoretical + practical	4	twenty tow
Editorial + practical	Lectures + practical	.Engine intake construction and reduction ratio	etiTheoretical + practical	4	twenty third
Editorial + practical	Lectures + practical	Stop group, the signaling system associated with .ascending and descending the elevator	Theoretical + practical	4	twenty fourth
Editorial + practical	Lectures + practical	Types of motors used in elevators, specifications, speed regulation for alternating and direct current .motors	Theoretical + practical	4	th25
Editorial + practical	Lectures + practical	Security precautions and frictional arrest of elevator sliding. Bottom and upper springs of the elevator. .Lighting	Theoretical + practical	4	twenty sixth-
Editorial + practical	Lectures + practical	Lightning arrestors, how lightning strikes and discharges, specifications for good implementation of lightning arrestors, protecting buildings and facilities .from lightning strikes	Theoretical + practical	4	th27
Editorial + practical	Lectures + practical	Solved equations based on lightning rod circuit .calculations	Theoretical + practical	4	Twent -y eighth
Editorial + practical	Lectures + practical	Methods of implementing projects, bids and requirements for their conditions, analysis of bids and .the principles on which the bid depends	Theoretical + practical	4	XXIX
		Estimation, its types, methods for conducting		4	thirty

		estimation and estimating the materials needed for a construction work and the amounts required for it. .Factors that affect the cost of engineering work			

12.Infrastructure	
Binding industrial establishments	Required prescribed books -1
Industrial establishments book project	(Main references (sources -2
Electrical installation technology (by Thompson) Electrical installation technology (by Michael Needle) Practice on low voltage switch gears (by Siemense Publication)	Recommended books and references (scientific journals, (...،reports
Various internet sources	Electronic references, -B ...Internet sites

13.Course development plan
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12. Infrastructure	
Methodical books	Required prescribed books -1
	(Main references (sources -2
Scientific books from libraries	Recommended books and references (scientific journals, (...،reports
Various internet sources	Electronic references, -B ...Internet sites

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Electrical drawing

Teaching the student to draw and read various electrical maps

-Middle Euphrates University/Technical Institute Samawa	1. Educational institution
Second Grade -Electrical Techniques	2. Scientific department/center
Electrical drawing	3. Course name/code
Section	4. Programs in which it is included
Mandatory daily attendance	5. Available attendance forms
Academic year2 /2023 202	6. Semester/year
weeks = 90 hours annually 30 * Practical 3	7. Number of study hours (total)
2024/20/4	8. Date this description was prepared
9. Course objectives	
General goal: Teach the student to draw and read various electrical maps	
:Specific Objective: The student will be able to 1- **Recognizes electrical symbols and reads maps and various electrical circuits** 2- **Learn how to draw symbols and connections for electrical installations, networks, and machines**	

10.Course outcomes and teaching, learning and evaluation methods

Cognitive objectives -A Introducing the student to designing electrical circuits using the computer - A1 Introducing the student to how to draw and read various electrical maps -A2 Introducing the student to drawing an operating circuit and a control circuit for electric motors -A3 Introducing the student to electrical symbols and reading maps and various electrical circuits -A4 Introducing the student to how to draw symbols and connections for electrical installations, networks, and machines -A5
.The skills objectives of the course -B of designing electrical circuits using the computer the skill Acquire -1 of using computers in electrical installations Acquire the skill - 2 Acquire the skill of drawing an operating circuit and a control circuit for electric motors -3 drawing and reading various electrical maps Acquire the skill of -4 symbols and connections for electrical installations, Acquire the skill of drawing -5 s, and machinesnetwork
Teaching and learning methods
Theoretical lectures + using the computer in the laboratory + scientific films on how to use the AutoCAD program
Evaluation methods
Written + practical + oral + discussion
Emotional and value goals -C (Homework (student exercises -C1 Theoretical lectures -C2 Applied skills within the laboratory -C3 Discussion within the laboratory -C4
Teaching and learning methods
Lectures + practical + scientific films + discussion
Evaluation methods
Written + practical + oral + discussion
Transferable general and qualifying skills (other skills related to employability -D .(and personal development Applied skills within the laboratory -D1 Scientific films -D2 skills based electrical circuit design-Computer Computer skills in electrical installations -D4 Skills of drawing an operating circuit and a control circuit for electric motors -D5 Skills for doing electrical installation for a small building or residential house using a computer -D6 Skills in drawing models of cable trays -D7

11.Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
practical	Lectures + practical	-Drawing the electrical wiring diagram for a two storey building	practical	3	the first
practical	Lectures + practical	Training students to see with ink and inking the previous painting	practical	3	the second
practical	Lectures + practical	Draw and prepare lists of what is required from the markets, their prices, quantities, and units, in order to be able to determine the total prices for the cost of electrical installations for a building consisting of three floors. The basement contains n shops, and each floor contains four te apartments, each of which is separate from the other, and each apartment contains three rooms .with accessories	practical	3	the third
practical	Lectures + practical	Explaining the electrical installations in various public -laboratories -locations (laboratories halls) using exposed and buried cables, along with .implementing a drawing board on that	practical	3	the fourth
practical	Lectures + practical	Drawing of electrical wiring board for connecting phase transformer-threeΔ andY type	practical	3	Fifth
practical	Lectures + practical	Drawing the electrical connection panel for a phase transformer connected in the form of -three aY Price -using Mirza type relays	practical	3	VI
practical	Lectures + practical	Drawing of the electrical connection panel to phase -reverse the direction of rotation of a three induction motor	practical	3	Seventh
practical	Lectures + practical	Drawing the complete electrical connection panel phase electric motor using -to operate a three Praise type relays-Mirza	practical	3	VIII
practical	Lectures + practical	Schematic drawing of a charging device for a phase source-battery from a three	practical	3	Ninth
practical	Lectures + practical	Establishing the complete installations of the phase electric -distribution panel for a three current generator whose internal poles feed direct current from a small generator installed along the axis of the original generator. Measurement and .vices are placed on the drawingprotection de	practical	3	The tenth
practical	Lectures + practical	Drawing a special electrical connection panel to carry out the compatibility process between a phase electric motor and the National -three Electricity Company. Measurement and .prevention devices will be placed on the drawing	practical	3	11
practical	Lectures + practical	Study and analysis of electrical maps, electrical symbols -mapping systems, map tracking method and numbering	practical	3	12

practical	Lectures + practical	**Using an electronic calculator to draw electrical maps**	practical	3	-14-13 15

12. Infrastructure	
The basics of engineering drawing, written by Abdel Hamid Gomaa Electrical drawing book project written by Hani Aziz	Required prescribed books -1
Engineering drawing & graphic technology (by Frend) Engineering drawing technology (by AW Wander William)	(Main references (sources -2
Odell Electrical Connections (lighting and (power Engineering drawing technology (by MC Graw)	Recommended books and references (scientific journals, (...،reports
Various internet sources	Electronic references, -B ...Internet sites

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PLC programmed logic control

It aims to introduce the student to modern control of factories and laboratories

-Middle Euphrates University/Technical Institute Samawa	1. Educational institution
Second Grade -Electrical Techniques	2. Scientific department/center
PLC programmed logic control	3. Course name/code
Section	4. Programs in which it is included
Mandatory daily attendance	5. Available attendance forms
Academic year 2023/2024	6. Semester/year
theoretical + 2 practical = 3 * 30 weeks = 90 1 hours annually	7. Number of study hours (total)
2024/20/4	8. Date this description was prepared
9. Course objectives	
It aims to introduce the student to modern control of factories and laboratories	

10.Course outcomes and teaching, learning and evaluation methods

Cognitive objectives -A Introducing the student to methods of maintenance and repair of electrical -A1 appliances and equipment rol panelsIntroducing the student to the maintenance of electrical cont -A2 Introducing the student to modern control methods -A3
.The skills objectives of the course -B (Workshops (electrical + mechanical -B1 Scientific visits -B2 Summer training -B3 Scientific films -B4
Teaching and learning methods
Laboratories + workshops + scientific visits
Evaluation methods
Written + practical + oral
Emotional and value goals -C (Homework (student exercises -C1 Theoretical lectures -C2 Applied skills within laboratories and laboratories -C3 -C4
Teaching and learning methods
Lectures + practical + scientific films
Evaluation methods
Editorial + practical

Transferable general and qualifying skills (other skills related to employability -D .(and personal development

Applied skills within laboratories, workshops and laboratories -D1

Scientific films -D2

Scientific visits -D3

-D4

11.Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Editorial + practical	Lectures + practical	**Chapter 1 Introduction to Programmable Controllers** **1-1 Definition** **1-2 A Historical Background** **1-3 Principles of Operation** **1-4 PLCs Versus Other Types of Controls .** **1-5 PLC Product Application Ranges .** **1-6 Ladder Diagrams and the PLC** **1-7 Advantages of PLCs**	Practical + theoretical	3	the first
Editorial + practical	Lectures + practical	**Number Systems and Codes** **2-1 Number Systems** **2-2 Number Conversions** **2-3 One's and Two's Complement** **2-4 Binary Codes** **2-5 Register Word Formats ..**	Practical + theoretical	3	the second
Editorial + practical	Lectures + practical	**Chapter 3 Logic Concepts** **3-1 The Binary Concept** **3-2 Logic Functions** **3-3 Principles of Boolean Algebra and Logic** **3-4 PLC Circuits and Logic Contact Symbology**	Practical + theoretical	3	the third
Editorial + practical	Lectures + practical	**Processors, the Power Supply, and Programming Devices** **4-1 Introduction** **4-2 Processors 4-3 Processor Scan** **4-4 Error Checking and Diagnostics** **4-5 The System Power Supply** **4-6 Programming Devices**	Practical + theoretical	3	the fourth
Editorial + practical	Lectures + practical	**The Memory System and I/O Interaction** **5-1 Memory Overview** **5-2 Memory Types** **5-3 Memory Structure and Capacity** **5-4 Memory organization and I/O Interaction**	Practical + theoretical	3	Fifth
Editorial + practical	Lectures + practical	**Configuring the PLC Memory — I/O Addressing** **5-6 Summary** **of Memory, Scanning, and I/O Interaction** **5-7 Memory considerations .**	Practical + theoretical	3	VI
Editorial + practical	Lectures + practical	**The Discrete Input/Output System** **7-1 Introduction to Discrete I/O Systems** **7-2 I/O Rack Enclosures and Table Mapping** **7-3 Remote I/O Systems .** **7-4 PLC Instructions for Discrete Inputs** **7-5 Types of Discrete Inputs .**	Practical + theoretical	3	Seventh
Editorial + practical	Lectures + practical	**PLC Instructions for Discrete Outputs** **8-1 Discrete Outputs** **8-2 Discrete Bypass/Control Stations 8-** **3 Interpreting I/O Specifications** **8-4 Summary of Discrete I/O**	Practical + theoretical	3	VIII
Editorial + practical	Lectures + practical	**The Analog Input/Output System** **9-1 Overview of Analog Input Signals** **9-2 Instructions for Analog Input Modules .** **9-3 Analog Input Data Representation .** **9-4 Analog Input Data Handling**	Practical + theoretical	3	Ninth

		9-5 Analog Input Connections . **9-6 Overview of Analog Output Signals**			
Editorial + practical	Lectures + practical	**Instructions for Analog Output Modules** **10-8 Analog Output Data Representation** **10-9 Analog Output Data Handling** **10-10 Analog Output Connections** **10-11 Analog Output Bypass/Control Stations**	Practical + theoretical	3	The tenth
Editorial + practical	Lectures + practical	**Special Function I/O and Serial Communication Interfacing** **11-1 Introduction to Special I/O Modules** **11-2 Special Discrete Interfaces** **11-3 Special Analog, temperature, and PID Interfaces** **11-4 Positioning Interfaces .** **11-5 ASCII, Computer, and Network Interfaces** **11-6 Fuzzy Logic Interfaces ..** **8-7 Peripheral Interfacing**	Practical + theoretical	3	11
Editorial + practical	Lectures + practical	**Programming Languages** **12-1 Introduction to Programming Languages** **12-2 Types of PLC Languages .** **12-3 Ladder Diagram Format** **12-4 Ladder Relay Instructions** **12-5 Ladder Relay Programming** **12-6 Timers and Counters** **12-7 Timer Instructions**	Practical + theoretical	3	12
Editorial + practical	Lectures + practical	**Counter Instructions** **13-9 Program/Flow Control Instructions** **13-10 Arithmetic Instructions** **13-11 Data Manipulation Instructions .** **13-12 Data Transfer Instructions .** **13-13 Special Function Instructions** **13-14 Network Communication Instructions** **13-15 Boolean Mne.**	Practical + theoretical	3	13
Editorial + practical		**PLC System Documentation** **14-1 Introduction to Documentation** **142 Steps for Documentation** **14-3 PLC Documentation Systems-4 Conclusion .**	Practical + theoretical		14
Editorial + practical		**PLC Start-Up and Maintenance** **15-1 PLC System Layout** **15-2 Power Requirements and Safety Circuitry** **15-3 Noise, Heat, and Voltage Considerations** **15-4 I/O Installation, Wiring, and Precautions**	Practical + theoretical		15

12.Infrastructure	
Methodical books	Required prescribed books -1
	(Main references (sources -2
Scientific books from libraries	Recommended books and references (scientific journals, (...،reports
Various internet sources	Electronic references, -B ...Internet sites

13.Course development plan

The project

Introducing the student to the prominent goals of the project, and introducing him to how to deal with a group of students in order to support group work

-Middle Euphrates University/Technical Institute Samawa	1. Educational institution
Second Grade -Electrical Techniques	2. Scientific department/center
The project	3. Course name/code
Section	4. Programs in which it is included
Mandatory weekly attendance	5. Available attendance forms
Academic year 2023/2024	6. Semester/year
practical * 30 weeks = 60 hours annually 2	7. Number of study hours (total)
2024/20/4	8. Date this description was prepared
9. Course objectives	
:The applicant will be able to 1- .He relies on himself to prove his practical skill 2- .Defines the salient objectives of the project 3- .Learns how to deal with a group of students in order to support group work 4- .Determines action steps, analyzes them, and develops alternatives if obstacles arise 5- .ojectDraws the steps and develops designs for the pr 6- .Follows up on the progress of work on the project in terms of time 7- .Estimates the cost of raw materials needed to build the project 8- .He sees and sees a simplified model of his work 9- .the research format Learns to write the final project report in an organized manner in	

10.Course outcomes and teaching, learning and evaluation methods

Cognitive objectives -A Introducing the student to the prominent objectives of the project -A1 Introducing the student to how to deal with a group of students in order to support -A2 group work Introducing the student to the steps of action, analyzing them, and developing -A3 alternatives in the event that obstacles arise to how to draw the steps and develop designs for the project Introducing the student -A4 Introducing the student to how to estimate the cost of the raw materials needed to build -A5 the project Teach the student how to write the final project report in an organized manner -A6 ing to the research formataccord
.The skills objectives of the course -B Acquiring the skill of how to deal with a group of students in order to support group -B1 work Acquire the skill of drawing steps and developing designs for the project -B2 Acquire the skill of estimating the cost of the raw materials needed to build the project -B3 Acquiring the skill of writing the final project report in an organized manner in the -B4 research format
Teaching and learning methods
Laboratories + workshops + scientific research
Evaluation methods
Practical + discussion
Emotional and value goals -C Search for a solution to the problem -C1 Search for materials used in the project -C2 Report writing skills -C3 Weekly discussion -C4
Teaching and learning methods
Discussion + practical + research
Evaluation methods
Discussion + practical

Transferable general and qualifying skills (other skills related to employability -D .(and personal development

Applied skills within laboratories, workshops and laboratories -D1
Skills of how to deal with a group of students in order to support group work -D2
Skills of drawing steps and developing designs for the project-D3
materials needed to build the project Skills of estimating the cost of raw -D4
Skills of writing the final project report in an organized manner in the research format -D5

11.Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Editorial + alpractic	Lectures + practical	**Distributing the projects to the students, meeting with the supervising professor, and beginning to review the library to obtain resources for the project assigned to the students**	Practical + theoretical	3	the first
Editorial + practical	Lectures + practical	**Collect information about the project, begin the theoretical study, and prepare the necessary .designs to implement the project**	Practical + theoretical	3	the second
Editorial + practical	Lectures + practical	**Begin implementing the planned designs in practice and conduct experiments and tests to obtain practical results. Test and evaluate the .previous stages**	Practical + theoretical	3	the third
Editorial + practical	Lectures + practical	**conducted -Transferring the laboratory experiments to the final panels to obtain the practical designed model, conduct testing on the final model, and obtain the final results for .discussion**	Practical + theoretical	3	the fourth
Editorial + practical	Lectures + practical	**Discussing the practical results and their compatibility with the realistic results and finding .the necessary explanations for the apparent cases**	Practical + theoretical	3	Fifth
Editorial + practical	Lectures + practical	**Arranging the written parts of the report for each of the previous stages of writing the final report :on the project is as follows** **- project name** **- Professor Supervisor** **- Students' names** **- Conclusion** **- Chapter One: Introduction** **- Chapter Two: The theoretical part** **- Chapter Three: The practical part and results** **- Chapter Four: Discussion of results, conclusions and proposals sources -**	Practical + theoretical	3	VI
Editorial + practical	Lectures + practical	**Delivering the practical model of the project with .the final report for final testing and evaluation**	Practical + theoretical	3	Seventh
Editorial + practical	Lectures + practical	**Distributing the projects to the students, meeting with the supervising professor, and beginning to review the library to obtain resources for the project assigned to the students**	Practical + theoretical	3	VIII

12.Infrastructure	
Methodical books	Required prescribed books -1
	(Main references (sources -2
Scientific books from libraries	Recommended books and references (scientific journals, (...،reports
Various internet sources	Electronic references, -B ...Internet sites

13.Course development plan