Academic Program Description Form

University Name: Al-Furat Al-Awsat Technical University

Faculty/Institute: Technical Institute / Babylon

Scientific Department: Department of Electronic Technologies

Academic or Professional Program Name: Electronic Technologies

Final Certificate Name: Electronic Technical diploma

Academic System: Yearly and Courses

Description Preparation Date: 01/02/2024

File Completion Date: 15/03/2024

Signature: Ahmed Mohammed Ali Ali
Head of Department Name: Electronic techniques Department

Date: 17 / 4 /2024

Signature:
Scientific Associate Name: Oras Khudhayer Obayes

Date: / /2024

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department: Khansaa Azeez Obayes Al-Husseini

Date: 17/4/2024
Signature:

Prof. Dr.
Eman Mohammed Abdullah
Dean of
Babylon Technical Institute
Approva

Approval of the Dean

1. Program Vision

The academic program aspires to achieve all its paragraphs and work on procession all changes and updates in the field reality and add them to the academic aspect with practical, applicable scientific visions.

2. Program Mission

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

3. Program Objectives

The specialization aims to graduated qualified personnel to work in the labor market capable of operating and maintaining electronic circuits, audio and video devices, receiving and transmitting devices, microprocessor circuits, and others.

4. Program Accreditation

Nothing.

5. Other external influences

Nothing.

6. Program Structure / Electronic Department

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	21	60	%35	All courses are core and there are no electives
College Requirements	21	60	%35	All courses are core and there are no electives
Department Requirements	19	57	%33	All courses are core and there are no electives
Summer Training	\	\	\	All courses are core and there are no electives
Other	\	\	\	

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

7. Program Structure/ Electronic Department / Smart Mobiles Branch

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements		**60**		All courses are core and there are no electives
College Requirements		**60**		All courses are core and there are no electives
Department Requirements	**41**	**57**	**68%**	All courses are core and there are no electives
Summer Training	\	\	\	All courses are core and there are no electives
Other	\	\	\	

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

8. Program Description – Electronic Department

Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Second Year	D	Measuring Devices	2	2
Second Year	M	Microprocessors	2	2
Second Year	EC	Electronic Circuits	2	2
Second Year	C,A	Computer Applications	1	2
Second Year	C,PLC	Control and PLC	1	2
Second Year	M,ED	Maintenance of Electronic Devices	2	2
Second Year	OS	Occupational Safety	1	1
Second Year	P	Project	2	2
Second Year	C	Communication	2	2
Second Year	AV	Audiovisual	2	2
First Year	EM	Electrical Measurements Circuits	2	2
First Year	M	Mathematics	2	--------
First Year	L	Laboratories (mechanical/electronic)	1	2
First Year	CA	Computer Applications	2	2
First Year	HR	Human Rights	2	---------
First Year	ED	Engineering and Electrical Drawing	----------	3
First Year	DC	Digital Circuits	2	2
First Year	E	Electronics	2	2
First Year	E	English	1	-------

7.2/ Program Description – Electronic Department / Smart Mobiles Branch

First Year

Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
1st Year / 1st Semester	EM	Human rights	2	0
1st Year / 1st Semester	CP	Computer principles	0	2
1st Year / 1st Semester	AL	Arabic Language	2	0
1st Year / 1st Semester	M1	Mathmatics-1	2	0
1st Year / 1st Semester	PDC	Principles of digital circuits	2	2
1st Year / 1st Semester	PE	Principles of electronics	2	2
1st Year / 1st Semester	DC	Direct current circuits	2	2
1st Year / 1st Semester	EW1	Electronics workshop-1	0	3
1st Year / 1st Semester	ED	Engineering drawing	0	3
1st Year / 1st Semester	MW	Mechanical Workshop	0	4
1st Year / 2nd Semester	D	Democracy	2	0
1st Year / 2nd Semester	CA	Computer application	0	2
1st Year / 2nd Semester	EL	English language	2	0
1st Year / 2nd Semester	M2	Mathmatics-2	2	0
1st Year / 2nd Semester	DC	Digital circuits	2	2
1st Year / 2nd Semester	E	Electronics	2	2
1st Year / 2nd Semester	AC	Alternative current circuits	2	2
1st Year / 2nd Semester	WE2	Workshop electronics-2	0	3
1st Year / 2nd Semester	ED	Electrical drawing	0	3
1st Year / 2nd Semester	EW	Electrical workshop	0	4

7.3/ Program Description – Electronic Department / Smart Mobiles Branch

Second Year

Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
2nd Year / 1st Semester	CM	Communication system	2	2
2nd Year / 1st Semester	MV	Microwaves	2	2
2nd Year / 1st Semester	EC	Electronic circuits	2	2
2nd Year / 1st Semester	EL	English Language	2	0
2nd Year / 1st Semester	CA	Computer applications	0	2
2nd Year / 1st Semester	WCS	Wire communication system	2	2
2nd Year / 1st Semester	MPSD	Maintenance principles of smartphone devices	0	3
2nd Year / 1st Semester	DTWN	Data transmission and wireless networks	2	2

2nd Year / 1st Semester	POF	Principles of optical Fibers	2	2
2nd Year / 1st Semester	P1	Project-1	0	2
2nd Year / 2nd Semester	DCS	Digital communication system	2	2
2nd Year / 2nd Semester	AM	Advance microwaves	2	2
2nd Year / 2nd Semester	AEC	Advanced electronic circuits	2	2
2nd Year / 2nd Semester	EL	English language	2	0
2nd Year / 2nd Semester	ACA	Advanced computer applications	0	2
2nd Year / 2nd Semester	AWCS	Advanced wire communication system	2	2
2nd Year / 2nd Semester	MSD	Maintenance of smartphone devices	0	3
2nd Year / 2nd Semester	PE	Professional ethics	2	2
2nd Year / 2nd Semester	AOF	Advanced optical fibers	2	2
2nd Year / 2nd Semester	P1	Projects-1	0	2

1. Expected learning outcomes of the program	
Knowledge	
Cognitive objectives	1 - The student able to understand and maintain electronic systems 2- The student able to understand and maintain communications systems and audio-visual equipment. 3- The student able to design electrical and electronic maps. 4- The student able to design integrated control systems.
Skills	
Skills objectives	1 - Operating, maintaining and building electronic circuits 2 - Operating, maintaining and repairing audio and visual equipment. 3 - Maintenance of microprocessor circuits.
Ethics	
Emotional and Ethics objectives	1 - Deducing solutions to the problems posed by subject teachers. 2- Deducing solutions to work problems during summer field training. 3- Solving mathematical equations in academic vocabulary. 4- Deducing solutions to practical cases presented during the lesson and lectures.

2. Teaching and Learning Strategies
Lectures, practical training in laboratories and summer field training in the field of work.

3. Evaluation methods
It is evaluated through attendance, daily lectures participation, and its behavior. As well as through daily, monthly and yearly examinations, discussions and dialogues during the educational process.

4. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Teacher	Electricity Engineering	Electronic			2	
Teacher	Electricity Engineering	Control			1	
Teacher	Law	Law			1	
Assistant Teacher	Electricity Engineering	Electronic			1	
Teacher	Electricity Engineering	Power			1	
Assistant Teacher	Communications Engineering	Communications			1	
Assistant Teacher	Arabic Language	Teaching methods			1	
Assistant Teacher	Mathematics	Functional analysis, dynamic systems			1	
Assistant Teacher	Physics	Nano Technology			1	

Professional Development

Mentoring new faculty members

The guidance mechanism in this field is internal through training courses, workshops, and discussion panels within the department or with other departments within the institution.

Professional development of faculty members

1. Teamwork within the group effectively and actively
2. Manage time effectively and set priorities with the ability to work on regular schedules
3. Leadership and the ability to direct and motivate others
4. Independence at work.

5. Acceptance Criterion

1. Iraqi nationality
2. Possession of an Iraqi preparatory school certificate supported by certification from the General Directorate of Education in the governorate or an equivalent certificate.
3. The student must be born in 1994 onwards.
4. Successful in the medical examination according to the conditions for each study, and the blind student (who meets the conditions for applying for appropriate humanitarian studies) will be submitted through central admission.
5. Devoted to study. It is not permissible to combine work and study (at the same time) in colleges and morning institutes. This includes employees of all government institutions. In order for them to continue studying, they must obtain a study leave from their departments starting in accordance with the instructions in force. It is not permissible to combine two studies either, and in the event of a dispute being proven. He writes to the Ministry to cancel his acceptance (the student employee can postpone his studies according to the instructions in order to fulfill the condition of completing two years of service - satisfactory to be entitled to obtain study leave and in accordance with the instructions for granting study leave).
6. Among my graduates:
    a. The current academic year.
    b. The previous academic year of those who are not centrally accepted into any college or institute, and they are accepted according to the minimum limits for the year of their graduation, and if it is proven that the student's acceptance into any college or institute will be returned to his original acceptance and it will be considered a year of failure for him.
7. Non-Iraqi students who hold an Iraqi preparatory certificate and are accepted centrally will be notified in writing to review the Central Admissions Department / Expatriates Division to state their exemption or demands for tuition fees in foreign currency according to the controls in Chapter Seven.

6. **The most important sources of information about the program**

1 - The curriculum determined by the Ministry of Higher Education and Scientific Research.
2- Available methodological books.
3- Books in the institute's library.

7. Program Development Plan

1- Student research.
2- Scientific seminars.
3- Personal training.
4- Scientific discussions.
5- Vocational training during the year

Program Skills Outline – Electronic Techniques Department															
	Course Code	Course Name	Required program Learning outcomes												
			Basic or optional	Knowledge				Skills				Ethics			
Year/Level				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First Year	EM	Electrical Measurements Circuits	Basic	*	*	*		*	*	*	*	*	*	*	*
	M	Mathematics	Basic	*	*	*	*	*	*	*		*		*	
	L	Laboratories (mechanical/electronic)	Basic	*		*		*		*		*		*	
	CA	Computer Applications	Basic	*		*		*	*			*	*		*
	HR	Human Rights	Basic	*				*				*			
	ED	Engineering and Electrical Drawing	Basic	*		*		*							
	DC	Digital Circuits	Basic	*	*	*		*	*	*		*	*		*
	Ele	Electronics	Basic	*	*	*		*	*		*	*	*		*
	E	English	Basic	*				*				*			

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

Program Skills Outline – Electronic Techniques Department															
Required program Learning outcomes															
Year/Level	**Course Code**	**Course Name**	**Basic or optional**	**Knowledge**				**Skills**				**Ethics**			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
Second Year	D	Measuring Devices	Basic	*	*		*	*		*	*	*		*	*
	M	Microprocessors	Basic	*		*	*	*		*	*	*		*	
	EC	Electronic Circuits	Basic	*	*	*		*	*	*	*	*	*	*	*
	C,A	Computer Applications	Basic	*	*	*		*	*		*	*	*	*	
	C,PLC	Control and PLC	Basic	*		*	*	*	*	*	*	*	*	*	
	M,ED	Maintenance of Electronic Devices	Basic	*	*	*		*	*	*	*	*		*	
	OS	Occupational Safety	Basic	*	*	*		*				*			
	P	Project	Basic	*				*				*			
	C	Communication	Basic	*	*	*	*	*		*	*			*	*
	AV	Audiovisual	Basic	*		*		*	*		*	*	*	*	

Program Skills Outline – Electronics Techniques department / Smart mobiles branch																
	Required program Learning outcomes															
				Knowledge				Skills				Ethics				
Year/Level	Course Code	Course Name	Basic or optional	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First Year - Second Semester	D	Democracy	Basic	*	*	*		*	*	*	*	*	*	*	*
	CA	Computer application	Basic	*	*	*	*	*	*	*		*		*	
	EL	English language	Basic	*		*		*		*		*		*	
	M2	Mathmatics-2	Basic	*		*		*	*			*	*		*
	DC	Digital circuits	Basic	*				*				*			
	E	Electronics	Basic	*		*		*							
	AC	Alternative current circuits	Basic	*	*	*		*	*	*		*	*		*
	WE2	Workshop electronics-2	Basic	*	*	*		*	*		*	*	*		*
	ED	Electrical drawing	Basic	*				*				*			

Program Skills Outline – Electronics Techniques department / Smart mobiles branch																
	Required program Learning outcomes															
				Knowledge				Skills				Ethics				
Year/Level	Course Code	Course Name	Basic or optional	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First Year - First Semester	EM	Human rights	Basic	*	*	*		*	*	*	*	*	*	*	*
	CP	Computer principles	Basic	*	*	*	*	*	*	*		*		*	
	AL	Arabic Language	Basic	*		*		*		*		*		*	
	M1	Mathmatics-1	Basic	*		*		*	*			*	*		*
	PDC	Principles of digital circuits	Basic	*				*				*			
	PE	Principles of electronics	Basic	*		*		*							
	DC	Direct current circuits	Basic	*	*	*		*	*	*		*	*		*
	EW1	Electronics workshop-1	Basic	*	*	*		*	*		*	*	*		*
	ED	Engineering drawing	Basic	*				*				*			

Program Skills Outline – Electronics Techniques department / Smart mobiles branch															
Required program Learning outcomes															
Year/Level	**Course Code**	**Course Name**	**Basic or optional**	**Knowledge**				**Skills**				**Ethics**			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
Second Year - Second Semester	DCS	Digital communication system	Basic	*	*		*	*		*	*	*		*	*
	AM	Advance microwaves	Basic	*		*	*	*		*	*	*		*	
	AEC	Advanced electronic circuits	Basic	*	*	*		*	*	*	*	*	*	*	*
	EL	English language	Basic	*	*	*		*	*		*	*	*	*	
	ACA	Advanced computer applications	Basic	*		*	*	*	*	*	*	*	*	*	
	AWCS	Advanced wire communication system	Basic	*	*	*		*	*	*	*	*		*	
	MSD	Maintenance of smartphone devices	Basic	*	*	*		*				*			
	PE	Professional ethics	Basic	*				*				*			
	AOF	Advanced optical fibers	Basic	*	*	*	*	*		*	*			*	*
	P1	Projects-1	Basic	*		*		*	*		*	*	*	*	

Program Skills Outline – Electronics Techniques department / Smart mobiles branch															
Required program Learning outcomes															
Year/Level	**Course Code**	**Course Name**	**Basic or optional**	**Knowledge**				**Skills**				**Ethics**			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
Second Year - First Semester	CM	Communication system	Basic	*	*		*	*		*	*	*		*	*
	MV	Microwaves	Basic	*		*	*	*		*	*	*		*	
	EC	Electronic circuits	Basic	*	*	*		*	*	*	*	*	*	*	*
	EL	English Language	Basic	*	*	*		*	*		*	*	*	*	
	CA	Computer applications	Basic	*		*	*	*	*	*	*	*	*	*	
	WCS	Wire communication system	Basic	*	*	*		*	*	*	*	*		*	
	MPSD	Maintenance principles of smartphone devices	Basic	*	*	*		*				*			
	DTWN	Data transmission and wireless networks	Basic	*				*				*			
	POF	Principles of optical Fibers	Basic	*	*	*	*	*		*	*			*	*
	P1	Project-1	Basic	*		*		*	*		*	*	*	*	

Course Description Form / Electronics Techniques department

Course Description Form

1. Course Name:
Electronics
2. Course Code:
E.L.E
3. Semester / Year:
First year
4. Description Preparation Date:
06/02/2024
5. Available Attendance Forms:
Theoretical lecture + laboratory
6. Number of Credit Hours (Total) / Number of Units (Total)
120 hours/ 4 unit
7. Course administrator's name (mention all, if more than one name)
Name: Abdulhussein Abdulzehra Abd Email: abdul.abd@atu.edu.iq
8. Course Objectives

Course Objectives	At the end of the course 1- The student should be able to know: a- Electronic components manufactured from semiconductors of various types - composition - properties - uses in electronic circuits - Its applications and analysis of its electronic circuits. b- an idea about optoelectronics and its components. c- an idea about integrated circuits and simplified applications of the operational amplifier. 2- The student should be able to: a-Use the basic electronic devices in the laboratory. b- Connecting electronic elements in simple electronic circuits. c-Know the specifications and features of electronic parts. d-Identify the applied circuits for some components and implement them

1. Teaching and Learning Strategies	
Strategy	1- Discussing with the students and asking questions about the lecture topic and how to think critically and analytically, and then directing them towards how to solve the problem in a way that suits the topic. 2- Explaining the material in a consistent way that is appropriate for the initial inquiries and discussions of the subject, in addition to using the available means of clarification that he consolidate the lesson, such as using video scenes on websites and realistic examples, in addition to addressing many solved examples. 3. Use feedback and evaluate the student's understanding of the material.

2. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Semiconductor theory - atomic structure - energy levels - crystals - conduction in crystals - holes current - how holes move.	Semiconductor theory	Theoretical lecture	oral examination and quiz
2nd week	2hr	doping - positive type (P) semiconductor - negative type (N) semiconductor- current of electrons and current of holes bulk resistance.	doping	Theoretical lecture	oral examination and quiz
3rd week	2hr	Semiconductor diodes - PN junction -formation of the depletion region - barrier voltage - thermal effects - - minority carrier current - permissive leakage current - breaking voltage - maximum forward current - maximum reverse current.	Semiconductor diodes	Theoretical lecture	oral examination and quiz
4th week	2hr	Biased diode - forward bias - reverse bias – characteristic curves in the forward and reverse directions -. The equivalent circuit of a diode.	Diode bias	Theoretical lecture	oral examination and quiz
5th week	2hr	The diode as a current rectifier - a half-wave rectifier - the calculation of dc value of the current - the r.m.s value of current - the output frequency.	Half-wave rectification	Theoretical lecture	oral examination and quiz
6th week	2hr	Full-wave rectification - using a center-tapped transformer - bridge rectifier - calculating average and effective values of voltages and currents - output frequency - comparison between half-wave and full-wave rectification - comparison between full-wave rectifiers.	Full-wave rectification	Theoretical lecture	oral examination and quiz
7th week	2hr	Filters – filtering using capacitor - RC and LC filters - output voltages - ripple - voltage doubler - clipping circuits - positive clipping - negative clipping - combination clipping - peak-to-peak detector - positive and negative clamps.	Filters	Theoretical lecture	oral examination and quiz
8th week	2hr	Zener diode - composition - symbol - forward and reverse characteristics - breakdown and breakage voltages - Zener impedance - temperature effects.	Zener diode	Theoretical lecture	oral examination and quiz
9th week	2hr	Zener approximations - constant voltage regulation - constant voltage source circuit - variable capacitance diode and its applications.	Zener approximations	Theoretical lecture	oral examination and quiz
10th week	2hr	Bipolar transistor - structure - symbol - characteristics - regions - definition of (βdc) and definition of (αdc), the relationship between them - definition of important regions on the characteristic's curves.	Bipolar transistor	Theoretical lecture	oral examination and quiz
11th week	2hr	Transistor bias circuits - base bias - emitter bias - collector bias - approximation in the transistor and the equivalent circuit.	Transistor bias	Theoretical lecture	oral examination and quiz
12th week	2hr	Transistor characteristics curves – operation regions - definition of Iceo and Icbo -current gain curve - relationship between Icbo and Ic	Transistor characteristics curves	Theoretical lecture	oral examination and quiz
13th week	2hr	Transistor bias circuits - base bias - emitter bias	Transistor bias circuits	Theoretical lecture	oral examination and quiz
14th week	2hr	Collector bias - self-bias - feed-back bias - voltage divider bias - applied examples.	Transistor bias circuits	Theoretical lecture	oral examination and quiz
15th week	2hr	operating points - quiescent point - applied examples	operating points	Theoretical lecture	oral examination and quiz

16th week	2hr	Transistor DC equivalent circuit – DC load line	Transistor DC equivalent circuit	Theoretical lecture	oral examination and quiz
17th week	2hr	Using the transistor to amplify small signals - the equivalent alternating circuit - current gain - voltage gain - power gain.	Using a transistor to amplify small signals	Theoretical lecture	oral examination and quiz
18th week	2hr	-Ideal Approximation-Hybrid Parameters-Equivalent circuit using h-parameters.	Hybrid parameters	Theoretical lecture	oral examination and quiz
19th week	2hr	Voltage gain - current gain - power gain - input and output resistors - small signal amplifiers - base market - emitter market.	small signal amplifiers	Theoretical lecture	oral examination and quiz
20th week	2hr	The use of a transistor in voltage regulation - a series regulator - a parallel regulator - a constant voltage source circuit.	The use of a transistor in voltage regulation	Theoretical lecture	oral examination and quiz
21st week	2hr	Field effect transistor - structure – characteristic of MOSFET -	Field effect transistor	Theoretical lecture	oral examination and quiz
22nd week	2hr	MOSFET - characteristics curves - Narrow voltage curves Vgs, Idss, Vp - Comparison between BJT, JFET - Working theory	Field effect transistor	Theoretical lecture	oral examination and quiz
23rd week	2hr	FET bias circuits - constant current source bias – operating point - self-bias - FET equivalent circuit -	FET bias circuits	Theoretical lecture	oral examination and quiz
24th week	2hr	Using FET in small signal amplification.	Using FET in small signal amplification	Theoretical lecture	oral examination and quiz
25th week	2hr	Comparison between the types of FET transistors (JFET - MOSFET) and transistor (BJT).	Comparison between FET and BJT types	Theoretical lecture	oral examination and quiz
26th week	2hr	Light-dependent resistor - light-emitting diode - photodiode - phototransistor - seven- segment display - its structure and applications.	optoelectronics and its components	Theoretical lecture	oral examination and quiz
27th week	2hr	Silicon rectifiers with current control (thyristors) - construction and types - characteristics - working theory	thyristors	Theoretical lecture	oral examination and quiz
28th week	2hr	Triac - Diac - their symbol - characteristics' - theory of operation - comparison between thyristors, Diac and Triac - protection of thyristors from (voltage change, current change).	thyristors	Theoretical lecture	oral examination and quiz
29th week	2hr	Integrated circuits - its meaning - its advantages and disadvantages - a comparison between it and discrete components - an idea about its manufacture - operational amplifier 741 - its symbol - its terminals - its uses - applications of operational amplifiers - small signal amplification - summing signals - subtracting signals - examples.	Integrated circuits	Theoretical lecture	oral examination and quiz
30th week		Operational amplifier applications: differentiator, comparator, integrator, … etc	Operational amplifier applications	Theoretical lecture	oral examination and quiz

	Practical				
Week	**Hours**	practical	**Unit or subject name**	**Learning method**	**Evaluation method**
1st week	2hr	Introduction to the use of equipment used in the laboratory	Common emitter amplifier	practical lecture	oral examination and writing report
2nd week	2hr	characteristics of diodes in forward bias and drawing of the characteristics curve -	Common collector amplifier	practical lecture	oral examination and writing report
3rd week	2hr	characteristics of diodes in reverse bias and drawing of the characteristics curve -	Common source amplifier - common drain amplifier	practical lecture	oral examination and writing report
4th week	2hr	Half-wave rectifier.	Measurement of hybrid parameters	practical lecture	oral examination and writing report
5th week	2hr	full wave bridge rectifier	Series voltage regulator	practical lecture	oral examination and writing report
6th week	2hr	Full wave rectifier using a center tapped transformer	characteristics of field effect transistor FET	practical lecture	oral examination and writing report
7th week	2hr	Half-wave rectifier with RC filter and LC filter	Common source amplifier.	practical lecture	oral examination and writing report
8th week	2hr	Full wave rectifier with RC filter and LC filter.	Common drain amplifier	practical lecture	oral examination and writing report
9th week	2hr	clipping circuits (positive, negative, and compound)	Photodiode characteristics.	practical lecture	oral examination and writing report
10th week	2hr	Constant voltage doubled circuits (for three or four times)	Characteristics of phototransistor	practical lecture	oral examination and writing report
11th week	2hr	Zener diode - forward and reverse characteristics.	Characteristics of thyristor SCR	practical lecture	oral examination and writing report
12th week	2hr	The use of a zener diode in regulating constant voltage with a fixed resistive load - The use of a zener diode in regulating voltage with a variable resistive load	Phase angle control using thyristors	practical lecture	oral examination and writing report
13th week	2hr	Characteristics of the common-base transistor.	Controlling the illumination of a lamp using a thyristor	practical lecture	oral examination and writing report
14th week	2hr	Characteristics of the common-emitter transistor.	Amplifier circuit using integrated circuit	practical lecture	oral examination and writing report
15th week	2hr	Common base amplifier (finding voltage gain and current gain)	Use an op amp to add and subtract two signals	practical lecture	oral examination and writing report
16th week	2hr	Common emitter amplifier (voltage gain and current gain) and plot the frequency response curve.	Common emitter amplifier	practical lecture	oral examination and writing report
17th week	2hr	Common collector amplifier (finding voltage gain and current gain).	Common collector amplifier	practical lecture	oral examination and writing report
18th week	2hr	Common source amplifier - common drain amplifier	Common source amplifier - common drain amplifier	practical lecture	oral examination and writing report

19th week	2hr	Measurement of hybrid parameters - for the common base configuration.	Measurement of hybrid parameters	practical lecture	oral examination and writing report
20th week	2hr	The use of transistors in voltage regulation circuits - series regulator.	Series voltage regulator	practical lecture	oral examination and writing report
21th week	2hr	characteristics of field effect transistor FET.	characteristics of field effect transistor FET	practical lecture	oral examination and writing report
22th week	2hr	Common source amplifier.	Common source amplifier.	practical lecture	oral examination and writing report
23th week	2hr	Common drain amplifier.	Common drain amplifier	practical lecture	oral examination and writing report
24th week	2hr	Photodiode characteristics.	Photodiode characteristics.	practical lecture	oral examination and writing report
25th week	2hr	Characteristics of phototransistor.	Characteristics of phototransistor	practical lecture	oral examination and writing report
26th week	2hr	Characteristics of thyristor SCR	Characteristics of thyristor SCR	practical lecture	oral examination and writing report
27th week	2hr	Use of thyristors - their properties - phase angle control	Phase angle control using thyristors	practical lecture	oral examination and writing report
28th week	2hr	An applied circuit for using thyristors to control lamp illumination.	Controlling the illumination of a lamp using a thyristor	practical lecture	oral examination and writing report
29th week	2hr	Amplifier circuit using integrated circuit.	Amplifier circuit using integrated circuit	practical lecture	oral examination and writing report
30th week	2hr	Use an op -amp to summing two signals and amplify the potential difference between the two signals.	Use an op amp to add and subtract two signals	practical lecture	oral examination and writing report

3. Course Evaluation

the Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
   a. First semester = 10 marks
   b. Second semester= 10 marks
2. **Practical:**
   a. Fiest semester= 10 marks
   b. Second semester= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
   a. Theoretical=40 marks

Practical =10 marks

4. Learning and Teaching Resources

Required textbooks (curricular, books, if any)	1- Electronic and audio circuits (written by: Dhia Mahdi and others), Dar Al-Tak Authority of Technical Institutes - Dar Al-Hekma 1990. 2- Electronic Circuits (Written by: Dhia Mahdi and others) Authority of Technical Instit 1990. 3- Power Electronics (Written by: Dhia Mahdi and others) Dar Al-Hekma 1990. 4- Industrial Electronics (Written by: Dhia Mahdi and others) Authority of Techn Institutes - Dar Al-Hekma 1985. 5- An Introduction to semiconductors By: (K.I.Gross).
Main references (sources)	Principles of Electronics - Malvino
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the electronic circuits topics.
Electronic References, Websites	All websites and video lectures related to electronic principles.

Course Description Form

1. Course Name:	
Electrical circuits and Measurements	
2. Course Code:	
E.C.M	
3. Semester / Year:	
First Year	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Hussain Salah Alkufaishy Email: Hussain.alkufaishyatu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 5. Know about Electrical circuits and their importance in scientific progress, in addition to their connection to other sciences. 6. Apply general electrical laws when analyzing electrical circuits. 3. Choose the most appropriate application when analyzing direct and alternating current circuits. 4. Learn about various basic electrical theories and perform mathematical applications on her 5. Connecting single-phase and three-phase equipment and dealing with various types of loads
7. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include most of the questions that can be asked about the topic and will be answered during the lecture. Students will be taken through a discussion in order to find the pre answers to those questions. This is followed by a detailed explanation of the topic by which many examples and solutions are given. Moreover, the lecture includes different educational videos which would virtually clarify the topic. At the end of the lecture, and to ensure that all students have understood the basics of the topic, students are discussed by various questions. On the other hand, during the practical lecture, the students are given the lecture as mentioned above, in addition to the practical application, which includes connecting the electrical circuits mad measurement devices and recording the data obtained from the circuit in order to be compared with the theoretical results, and then writing a detailed report on the experiment and its results.

8. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Electric units' system- Mathematic applications- definition of basic units of voltage, current and resistance-electric circuit components- ohm's law- factors effecting on resistance- resistivity of conductors and insulators- effect of temp. on resistance- temp. Coeff. of resistance- Examples		Theoretical lecture	oral examination and quiz
2nd week	2hr	DC current circuits includes: - Series connection of resistances and examples Parallel connection of resistances and examples - Combined connection of resistances and examples - Star and delta connection of resistances, conversion between star and delta with examples		Theoretical lecture	oral examination and quiz
3rd week	2hr	Applications on series, parallel, combined and star-delta connections		Theoretical lecture	oral examination and quiz
4th week	2hr	Kirchoff Laws- Kirchoff current and voltage laws with examples		Theoretical lecture	oral examination and quiz
5th week	2hr	Maxwell's law with examples		Theoretical lecture	oral examination and quiz
6th week	2hr	Definition of Thevinin's theorem- How to apply in dc current		Theoretical lecture	oral examination and quiz
7th week	2hr	Definition of Norton's theorem- How to apply in dc current		Theoretical lecture	oral examination and quiz
8th week	2hr	Examples on Thevinin's and Norton's theorems		Theoretical lecture	oral examination and quiz
9th week	2hr	Definition of Supper position theorem-application of it in dc current-examples- Max. power transfer theorem with examples		Theoretical lecture	oral examination and quiz
10th week	2hr	AC quantities-definition of AC current characteristics – generation of AC current with waveform drawing- RMS value-Form factor – examples		Theoretical lecture	oral examination and quiz
11th week	2hr	Vector of AC quantities-definition of it – Phasor representation of its- phase angle- resultant of vector AC add., Subt., multiply, division with examples		Theoretical lecture	oral examination and quiz
12th week	2hr	Effect of AC current on only resistance circuit-only inductance circuit- only capacitor circuit- phase angle between voltage and current with examples		Theoretical lecture	oral examination and quiz
13th week	2hr	Effect of AC current on resistance and inductance in series circuit-resistance and capacitor in series- resistance and inductance and capacitor in series- phase angle- total impedance with examples		Theoretical lecture	oral examination and quiz
14th week	2hr	Effect of AC current on resistance and inductance in parallel circuit-resistance and capacitor in series- resistance and inductance and capacitor in series- phase angle- total impedance with examples		Theoretical lecture	oral examination and quiz
15th week	2hr	Using j-operator to find total impedance- total admittance-current, voltage and phase angle for impedances in series and parallel with examples		Theoretical lecture	oral examination and quiz
16th week	2hr	Series and Parallel resonance circuits- calculation of voltage, current, impedance, phase angle and frequency at resonance with examples		Theoretical lecture	oral examination and quiz
17th week	2hr	Applications of Thevinin's, Norton's and supper position theorems with examples		Theoretical lecture	oral examination and quiz

18th week	2hr	Calculation of power in AC circuits-only resistance circuit-only inductance circuit-only capacitor circuit-resistance, inductance and capacitor in series and parallel-active and reactive power		Theoretical lecture	oral examination and quiz
19th week	2hr	Apparent power- power triangle drawing- power factor correction		Theoretical lecture	oral examination and quiz
20th week	2hr	Max. power transfer in AC circuits- with examples		Theoretical lecture	oral examination and quiz
21th week	2hr	Networks analysis using Nodel analysis-number of nodel equations		Theoretical lecture	oral examination and quiz
22th week	2hr	Examples on Networks analysis using Nodel analysis		Theoretical lecture	oral examination and quiz
23th week	2hr	AC three phase circuits-generation of 1-phase, 2-phase and three phase current-star delta connection-phase power-line power- total power-examples		Theoretical lecture	oral examination and quiz
24th week	2hr	Examples on AC three phase circuits with star delta connections		Theoretical lecture	oral examination and quiz
25th week	2hr	Methods of power measurement for three phase loads-wattmeter- two wattmeter-three wattmeter		Theoretical lecture	oral examination and quiz
26th week	2hr	Transient cases in circuits- DC transient – RL-RC-RLC transient		Theoretical lecture	oral examination and quiz
27th week	2hr	Transient AC currents– Sinusoidal Transient currents in RL-RC-RLC circuits		Theoretical lecture	oral examination and quiz
28th week	2hr	Self-induction of coil- equation of self-induction-mutual induction between two coils: - Progressive Series connection - Reverse Series connection		Theoretical lecture	oral examination and quiz
29th week	2hr	Transformers- structure-drawing-characteristics- its operation and relationships- types of its-examples		Theoretical lecture	oral examination and quiz
30th week	2hr	Curves of current in induction circuit- current drawing and calculation of time constant-charge, discharge the capacitors-time constant effect- examples.		Theoretical lecture	oral examination and quiz
Practical					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1st week	2hr	Identify the work into lab, report procedure and using of instruments		practical lecture	oral examination and writing report
2nd week	2hr	Calculation of resistances using color codes-error ratio- device of a ohmmeter		practical lecture	oral examination and writing report
3rd week	2hr	Using of DC and AC voltage measurement devices-DC and AC current measurement devices (Avometer)- using DC power supply device		practical lecture	oral examination and writing report
4th week	2hr	Measurement of EMF and internal resistance of Battery- study of temp. coefficient of resistance		practical lecture	oral examination and writing report
5th week	2hr	Finding the resistivity of some conductors-Verification of ohm's law		practical lecture	oral examination and writing report
6th week	2hr	Resistances connection (series- parallel –combined) many exercises		practical lecture	oral examination and writing report
7th week	2hr	Equivalent circuit between Star and delta connection for DC current		practical lecture	oral examination and writing report
8th week	2hr	Verification of Kirchoff first and second laws practically		practical lecture	oral examination and writing report
9th week	2hr	Verification of Thevenin and Norton theorems		practical lecture	oral examination and writing report
10th week	2hr	Verification of Supper position theorem		practical lecture	oral examination and writing report
11th week	2hr	Power distributer-max dc power transfer theorem-verification the theorem with it's three probabilities		practical lecture	oral examination and writing report

12th week	2hr	Oscp device-comparison between max. and medium value practically		practical lecture	oral examination and writing report
13th week	2hr	(RC-Rl) Series and parallel connection		practical lecture	oral examination and writing report
14th week	2hr	Phase angle Measurement of RLC in series		practical lecture	oral examination and writing report
15th week	2hr	Phase angle Measurement of RLC in parallel		practical lecture	oral examination and writing report
16th week	2hr	Series Resonance – Parallel Resonance		practical lecture	oral examination and writing report
17th week	2hr	Verification of Thevinin and Norton theorems for AC current		practical lecture	oral examination and writing report
18th week	2hr	Comparison between analogue and digital voltmeter in measuring DC and AC voltage		practical lecture	oral examination and writing report
19th week	2hr	max AC power transfer theorem- verification the theorem with it's three probabilities		practical lecture	oral examination and writing report
20th week	2hr	Power measurement using three voltmeter and three Ammeter		practical lecture	oral examination and writing report
21th week	2hr	Power and power factor measurement using wattmeter		practical lecture	oral examination and writing report
22th week	2hr	Power factor correction		practical lecture	oral examination and writing report
23th week	2hr	Voltage and current in three phases star and delta connection		practical lecture	oral examination and writing report
24th week	2hr	Resistance measuring using wteston's bridge		practical lecture	oral examination and writing report
25th week	2hr	Loaded voltage divider-no loaded voltage divider		practical lecture	oral examination and writing report
26th week	2hr	Resistances measuring using voltmeter and Ameter		practical lecture	oral examination and writing report
27th week	2hr	Using of meger to measure high resistance (insulation resistance)		practical lecture	oral examination and writing report
28th week	2hr	Increasing measuring range of an ameter- Calibration of an ameter with other device		practical lecture	oral examination and writing report
29th week	2hr	Increasing measuring range of voltmeter- Calibration of voltmeter device		practical lecture	oral examination and writing report
30th week	2hr	Study of time constant of RL circuit- Study of time constant of RC circuit		practical lecture	oral examination and writing report

9. Course Evaluation

the Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
   a. First semester = 10 marks
   b. Second semester= 10 marks
2. **Practical:**
   a. Fiest semester= 10 marks
   b. Second semester= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
   a. Theoretical=40 marks

Practical =10 marks

10. Learning and Teaching Resources

1- Electrical Technology (Edward Hughes).
2- Basic Circuit(A.M.Brooks).pergaman press.
3- Introduction To Electric Circuit (M.Romanwltz) John Willey .
4- Basic Electrical Engineering (Fitzgerald& Rlgginbothan). Graw
5- الكراس المختبري
6.مبادئ علم الهندسة الكهربائية (محمدزكي,د. مظفر أنور)

Course Description Form

1. Course Name:	
Engineering and electrical drawing	
2. Course Code:	
EED	
3. Semester / Year:	
First year	
4. Description Preparation Date:	
05/02/2024	
5. Available Attendance Forms:	
Practical lecture	
6. Number of Credit Hours (Total) / Number of Units (Total)	
90 hours/ 6 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Eman Jawad Email: eman.naji@atu.edu.iq	
8. Course Objectives	
Course Objectives	**1- He knows the advantages of computer drawing.** **2- Recognizes the system interface (AUTO CAD), its bars, drawing and adjustment menus.** **3- Learns to use the AUTO CAD program for drawing electrical and electronic circuits.**
1. Teaching and Learning Strategies	
Strategy	1.Explain the material to students in a way that the student learns how to draw using a computer 2.Students apply various drawings and strengthen their skills in dealing with the required drawing and modificati instructions. 3.Assessment of students through paintings and exams

2. Course Structure

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	3hr	Advantages of computer drawing and the basic components of the AUTOCAD program		practical lecture	Daily exam and boards
2nd week	3hr	How to activate and run the AutoCAD Program interface hide tapes activate tapes and icons		practical lecture	Daily exam and boards
3rd week	3hr	Detailed explanation of the components of the draw bar, Modify, tools bar		practical lecture	Daily exam and boards
4th week	3hr	Identify the types of drawing lines in the program and how to download the types of lines		practical lecture	Daily exam and boards
5th week	3hr	How to draw line, circle, arc, in their different ways		practical lecture	Daily exam and boards
6th week	3hr	How to draw polygon, polyline, rectangle, multiline		practical lecture	Daily exam and boards
7th week	3hr	Adding dimensions and texts in the AutoCAD program		practical lecture	Daily exam and boards
8th week	3hr	Performing engineering operations, drawing a triangle in its three ways, drawing a straight line parallel to a known straight line, and drawing a circle passing the vertices of the Triangle		practical lecture	Daily exam and boards
9th week	3hr	Divide a straight line into several equal parts draw a pentagonal polygon with radius information		practical lecture	Daily exam and boards
10th week	3hr	Projectors how to draw projectors how to execute projectors		practical lecture	Daily exam and boards
11th week	3hr	Practical applications to projectors		practical lecture	Daily exam and boards
12th week	3hr	Practical applications to projectors		practical lecture	Daily exam and boards
13th week	3hr	Practical applications to projectors		practical lecture	Daily exam and boards
14th week	3hr	Practical applications to projectors		practical lecture	Daily exam and boards
15th week	3hr	How to draw and create three-dimensional drawings in AUTOCAD		practical lecture	Daily exam and boards
16st week	3hr	How to draw and create three-dimensional drawings in the AutoCAD program		practical lecture	Daily exam and boards
17ndweek	3hr	How to draw and create three-dimensional drawings in the AutoCAD program		practical lecture	Daily exam and boards
18rd week	3hr	How to draw and create three-dimensional drawings in the AutoCAD program		practical lecture	Daily exam and boards
19th week	3hr	How to draw and create three-dimensional drawings in the AutoCAD program		practical lecture	Daily exam and boards
20th week	3hr	Electronic electrical codes overview		practical lecture	Daily exam and boards
21th week	3hr	Block, Insert, Block, Attribute		practical lecture	Daily exam and boards
22th week	3hr	How to insert electrical and electronic codes to the program interface		practical lecture	Daily exam and boards
23th week	3hr	Connecting electrical and electronic symbols by fonts and practical applications		practical lecture	Daily exam and boards
24th week	3hr	Practical applications for drawing electrical circuits		practical lecture	Daily exam and boards
25th week	3hr	Practical applications for drawing electrical circuits		practical lecture	Daily exam and boards

26th week	3hr	Practical applications for drawing electrical circuits		practical lecture	Daily exam and boards
27th week	3hr	Practical applications of electronic circuit drawing		practical lecture	Daily exam and boards
28th week	3hr	Practical applications of electronic circuit drawing		practical lecture	Daily exam and boards
29th week	3hr	Practical applications of electronic circuit drawing		practical lecture	Daily exam and boards
30th week	3hr	Practical applications of electronic circuit drawing		practical lecture	Daily exam and boards

3. Course Evaluation

the Distribution of the score out of 100 is according to the following:

1. **Practical:**
   a. Exam= 20 marks
   b. Daily drawing= 20 marks
2. **daily oral and preparation= 10 Marks**
3. **Final exam** =50 marks

4. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering and electrical drawing
Main references (sources)	Descriptive geometry
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the Engineering and electr drawing
Electronic References, Websites	All sites and video lectures that are interested in electrical drawir

Course Description Form

1. Course Name:	
Mathematics	
2. Course Code:	
R	
3. Semester / Year:	
First year	
4. Description Preparation Date:	
05/02/2024	
5. Available Attendance Forms:	
Theoretical lecture	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Eman Jawad Naji Email: eman.naji@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. The student understands the laws and mathematical issues 2. To solve simple and complex electrical circuits using mathematics 3. knows the applications of Engineering Mathematics
4. Teaching and Learning Strategies	
Strategy	1.Discuss the students and ask questions about the topic of the lecture and how to think critically and analytica and then guide them towards how to solve the problem in a way that suits the topic. 2.Explain the material in a consistent manner commensurate with the initial inquiries and discussions of the top in addition to using the available means of explanation that help to consolidate the lesson through solved exam and exercises that provoke brainstorming students. 3.The use of feedback and assessment of the student's comprehension of the material.

5. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Types of matrices, operations on matrices		Theoretical lecture	Solving exercises + daily exam
2nd week	2hr	Solving linear equations using determinants (Cramer's rule)		Theoretical lecture	Solving exercises + daily exam
3rd week	2hr	Vectors –vector analysis-scalar and Vector quantities – vector algebra –operations on vectors – phase angle		Theoretical lecture	Solving exercises + daily exam
4th week	2hr	Orthogonal vectors-scalar and directional multiplication-applications.		Theoretical lecture	Solving exercises + daily exam
5th week	2hr	Trigonometric function - trigonometric relations-logarithmic function		Theoretical lecture	Solving exercises + daily exam
6th week	2hr	Exponential functions Hyperbola functions and their applications		Theoretical lecture	Solving exercises + daily exam
7th week	2hr	Limits – limits of algebraic and trigonometric functions-applications		Theoretical lecture	Solving exercises + daily exam
8th week	2hr	Differential –derivation by definition – derivation of algebraic functions-chain rule		Theoretical lecture	Solving exercises + daily exam
9th week	2hr	Standard implicit function-higher-order derivative		Theoretical lecture	Solving exercises + daily exam
10th week	2hr	Derivation of trigonometric and logarithmic functions		Theoretical lecture	Solving exercises + daily exam
11th week	2hr	The derivative of exponential functions		Theoretical lecture	Solving exercises + daily exam
12th week	2hr	Applications of the derivation-the equation of tangent and column -, acceleration and velocity		Theoretical lecture	Solving exercises + daily exam
13th week	2hr	Increasing and decreasing-minor and great endings		Theoretical lecture	Solving exercises + daily exam
14th week	2hr	General physical and engineering applications		Theoretical lecture	Solving exercises + daily exam
15th week	2hr	Indefinite integration-integration of algebraic-trigonometric functions		Theoretical lecture	Solving exercises + daily exam
16st week	2hr	Integration of exponential functions		practical lecture	Solving exercises + daily exam
17ndweek	2hr	Definite integration-applications-the space under the curve-between two curves		practical lecture	Solving exercises + daily exam

18rd week	2hr	Rotational volumes – the length of the curved arc		practical lecture	Solving exercises + daily exam
19th week	2hr	Physical and engineering applications		practical lecture	Solving exercises + daily exam
20,21, 22th week	2hr	General methods of integration, including compensation, segmentation, the use of partial, exponential and logarithmic fractions and their applications		practical lecture	Solving exercises + daily exam
23th week	2hr	Numerical methods in integration – the base of the trapezoid		practical lecture	Solving exercises + daily exam
24,25th week	2hr	Solving discrete, homogeneous and linear differential equations with their various applications		practical lecture	Solving exercises + daily exam
26th week	2hr	Complex numbers addition, subtraction, multiplication and division		practical lecture	Solving exercises + daily exam
27th week	2hr	The polar and algebraic formula and the transformation between them and vice versa		practical lecture	Solving exercises + daily exam
28th week	2hr	Powers and roots - representation of roots		practical lecture	Solving exercises + daily exam
29th week	2hr	Statistical operations – frequency distributions – histogram –frequency curve		practical lecture	Solving exercises + daily exam
30th week	2hr	Arithmetic mean-rate-deviation L=Standard-variance-the relationship between the mean and the median		practical lecture	Solving exercises + daily exam

6. Course Evaluation

The Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
   a. First semester = 20 marks
   b. Second semester= 20 marks
2. **daily oral and preparation= 10 Marks**
3. **Final exam**
   a. Theoretical=50 marks

7. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Applied mathematics-Yaequb Sibagha
Main references (sources)	Solving electrical circuits-Joseph Methods for solving differential equations-Khaled Ahmed Samarai Yahya Abdul said Calculus ((Thomas)) Laplace transformation
Recommended books and references (scientific journals, reports…)	All books and Journals which includes the appl mathematics
Electronic References, Websites	All applied mathematics websites on the internet

Course Description Form

1. Course Name:	
Technical English	
2. Course Code:	
T.E	
3. Semester / Year:	
First year	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 2 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Asmaa Adnan Email: asmaa.najm@atu.edu.iq	
8. Course Objectives	
Course Object	1. The student should understand the specialty terminology in English 2. Skills objectives for the course. 3. The student learns to speak English and know the terminology
11. Teaching and Learning Strategies	
Strategy	Speak English fluently

12. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4	1	Unit -1- Introduction and Review to English language. Introduction to parts of speech. Sentence Patterns.	Introduction to parts of speech	Theoretical lecture	oral examination and quiz
5-6	1	Unit -2- Reading Comprehension and structure (selected scientific passages general to all specializations)	selected scientific passages general to all specializations	Theoretical lecture	oral examination and quiz
7-8	1	Scientific Attitude (Simple present)	Simple present	Theoretical lecture	oral examination and quiz
9-10	1	Mathematics(passive)	Mathematics(passive)	Theoretical lecture	oral examination and quiz
11-12	1	Scientific Methods (simple past)	Scientific Methods (simple past)	Theoretical lecture	oral examination and quiz
13-14	1	Test	Test	Theoretical lecture	oral examination and quiz
15-16	1	Unit -4- Conversation (from daily life Meeting people	Conversation (from daily life Meeting people	Theoretical lecture	oral examination and quiz
17-18	1	Talking about your job	Talking about your job	Theoretical lecture	oral examination and quiz
19-20	1	Unit -5- The use of library, Dictionary and Internet.	The use of library, Dictionary and Internet.	Theoretical lecture	oral examination and quiz
21-22	1	Unit -6- Translation Selected topics from internet to be translated	Translation Selected topics from internet to be translated	Theoretical lecture	oral examination and quiz
23-24	1	Unit -7- Writing Technical Reports	Writing Technical Reports	Theoretical lecture	oral examination and quiz
25-29	1	Unit -8- Terminology Selected Passages according to specializations	Terminology Selected Passages according to specializations	Theoretical lecture	oral examination and quiz
30	1	Final Test	Final Test	Theoretical lecture	oral examination and quiz

13. Course Evaluation

the Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
    a. First semester = 20 marks
    b. Second semester= 20 marks
2. **daily oral and preparation= 10 Marks**
3. **Final exam**
    a. Theoretical=50 marks

14. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Technical language book project
Main references (sources)	Technical language book project
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Computer applications	
2. Course Code**:**	
CA	
3. Semester / **Year**:	
Second semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
90 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Heba Zuhair Email: heba.abdalkareem@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Teaching the student to be familiar with the basic rules for dealing with and managing a computer. 2. It helps him in completing projects, printing matters, creating presentations, and designing engineering plans. **3.** The student learns to use the Internet in many fields, including education, scientific research, trade, marketing through electronic correspondence, web pages, and electronic communication.
9. Teaching and Learning Strategies	
Strategy	Live questions and answers about previous material Analyzing the student's ability to comprehend through homework, carried out at home and stored on the computer Discs to display directly in front of students to see how much they learned from the previous lecture- Showing educational films specific to the subject in order to consolidate the ability to learn, use feedback, and evaluate the extent of the student's understanding of the subject.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	1hr	Network concept	Network	Theoretical lecture	oral examination and quiz
2nd week	1hr	Types of networks and the concept of the Internet	Network	Theoretical lecture	oral examination and quiz
3rd week	1hr	Description of the main screen, its components, and how to connect to the global network	Network	Theoretical lecture	oral examination and quiz
4th week	1hr	Take advantage of different search engines	Network	Theoretical lecture	oral examination and quiz
5th week	1hr	Learn about ways to search for and access information	Network	Theoretical lecture	oral examination and quiz
6th week	1hr	Learn about the concept of Excel: its benefits and specifications	Excel	Theoretical lecture	oral examination and quiz
7th week	1hr	Identify the main screen and its components, including various menus and tools	Excel	Theoretical lecture	oral examination and quiz
8th week	1hr	Identify the main screen and its components, including various menus and tools	Excel	Theoretical lecture	oral examination and quiz
9th week	1hr	Identify the main screen and its components, including various menus and tools	Excel	Theoretical lecture	oral examination and quiz
10th week	1hr	The concept of the cell, basic data types and how to enter them	Excel	Theoretical lecture	oral examination and quiz
11th week	1hr	The concept of the cell, basic data types and how to enter them	Excel	Theoretical lecture	oral examination and quiz
12th week	1hr	How to save data Open the saved file.	Excel	Theoretical lecture	oral examination and quiz
13th week	1hr	enter data and perform calculations	Excel	Theoretical lecture	oral examination and quiz
14th week	1hr	Inserting various arithmetic functions	Excel	Theoretical lecture	oral examination and quiz
15th week	1hr	AutoCAD program: getting to know the program environment	AutoCAD	Theoretical lecture	oral examination and quiz
16th week	1hr	Preparing the drawing sheet, opening a new file, drawing borders, drawing units, network, jumping, storage	AutoCAD	Theoretical lecture	oral examination and quiz
17th week	1hr	Recognizing the different drawing commands, line, point...	AutoCAD	Theoretical lecture	oral examination and quiz
18th week	1hr	Recognizing the different drawing commands, line, point...	AutoCAD	Theoretical lecture	oral examination and quiz
19th week	1hr	Learn about modification commands	AutoCAD	Theoretical lecture	oral examination and quiz
20th week	1hr	Learn about modification commands	AutoCAD	Theoretical lecture	oral examination and quiz
21th week	1hr	Add dimensions	AutoCAD	Theoretical lecture	oral examination and quiz
22th week	1hr	Add texts and precise drawing sectors	AutoCAD	Theoretical lecture	oral examination and quiz

23th week	1hr	Control drawing specifications	AutoCAD	Theoretical lecture	oral examination and quiz
24th week	1hr	Introduction to 3D drawing	AutoCAD	Theoretical lecture	oral examination and quiz
25th week	1hr	Creating 3D surfaces	AutoCAD	Theoretical lecture	oral examination and quiz
26th week	1hr	Create 3D objects	AutoCAD	Theoretical lecture	oral examination and quiz
27th week	1hr	Create 3D objects	AutoCAD	Theoretical lecture	oral examination and quiz
28th week	1hr	Create 3D objects	AutoCAD	Theoretical lecture	oral examination and quiz
29th week	1hr	Create 3D objects	AutoCAD	Theoretical lecture	oral examination and quiz
30th week	1hr	Change the interface from 3D to 2D or classic	AutoCAD	Theoretical lecture	oral examination and quiz

Practical

Week	2hr	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Network concept	Network	practical lecture	oral examination and writing report
2nd week	2hr	Types of networks and the concept of the Internet	Network	practical lecture	oral examination and writing report
3rd week	2hr	Description of the main screen, its components, and how to connect to the global network	Network	practical lecture	oral examination and writing report
4th week	2hr	Take advantage of different search engines	Network	practical lecture	oral examination and writing report
5th week	2hr	Learn about ways to search for and access information	Network	practical lecture	oral examination and writing report
6th week	2hr	Learn about the concept of Excel: its benefits and specifications	Excel	practical lecture	oral examination and writing report
7th week	2hr	Identify the main screen and its components, including various menus and tools	Excel	practical lecture	oral examination and writing report
8th week	2hr	Identify the main screen and its components, including various menus and tools	Excel	practical lecture	oral examination and writing report
9th week	2hr	Identify the main screen and its components, including various menus and tools	Excel	practical lecture	oral examination and writing report
10th week	2hr	The concept of the cell, basic data types and how to enter them	Excel	practical lecture	oral examination and writing report
11th week	2hr	The concept of the cell, basic data types and how to enter them	Excel	practical lecture	oral examination and writing report
12th week	2hr	How to save data Open the saved file.	Excel	practical lecture	oral examination and writing report
13th week	2hr	enter data and perform calculations	Excel	practical lecture	oral examination and writing report

14th week	2hr	Inserting various arithmetic functions	Excel	practical lecture	oral examination and writing report
15th week	2hr	AutoCAD program: getting to know the program environment	AutoCAD	practical lecture	oral examination and writing report
16th week	2hr	Preparing the drawing sheet, opening a new file, drawing borders, drawing units, network, jumping, storage	AutoCAD	practical lecture	oral examination and writing report
17th week	2hr	Recognizing the different drawing commands, line, point...	AutoCAD	practical lecture	oral examination and writing report
18th week	2hr	Recognizing the different drawing commands, line, point...	AutoCAD	practical lecture	oral examination and writing report
19th week	2hr	Learn about modification commands	AutoCAD	practical lecture	oral examination and writing report
20th week	2hr	Learn about modification commands	AutoCAD	practical lecture	oral examination and writing report
21th week	2hr	Add dimensions	AutoCAD	practical lecture	oral examination and writing report
22th week	2hr	Add texts and precise drawing sectors	AutoCAD	practical lecture	oral examination and writing report
23th week	2hr	Control drawing specifications	AutoCAD	practical lecture	oral examination and writing report
24th week	2hr	Introduction to 3D drawing	AutoCAD	practical lecture	oral examination and writing report
25th week	2hr	Creating 3D surfaces	AutoCAD	practical lecture	oral examination and writing report
26th week	2hr	Create 3D objects	AutoCAD	practical lecture	oral examination and writing report
27th week	2hr	Create 3D objects	AutoCAD	practical lecture	oral examination and writing report
28th week	2hr	Create 3D objects	AutoCAD	practical lecture	oral examination and writing report
29th week	2hr	Create 3D objects	AutoCAD	practical lecture	oral examination and writing report
30th week	2hr	Change the interface from 3D to 2D or classic	AutoCAD	practical lecture	oral examination and writing report

11. Course Evaluation

the Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
    a. First semester = 10 marks
    b. Second semester= 10 marks
2. **Practical:**
    a. Fiest semester= 10 marks
    b. Second semester= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
    a. Theoretical=40 marks
    b. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	AutoCAD
Main references (sources)	AutoCAD
Recommended books and references (scientific journals, reports…)	AutoCAD
Electronic References, Websites	AutoCAD website

Course Description Form

1. Course Name:	
Human rights and Democracy	
2. Course Code:	
H R	
3. Semester / Year:	
First Year	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 1 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: zaid khudhur Email:zaid.bermany@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Know about human rights. **2.** In addition, the student will be able to deal with different Theories of human right
9. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include mos the questions that can be asked about the topic and will be answered during the lecture. Students will be taken thro a discussion in order to find the pre answers to those questions.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	1	Introduction		Theoretical lecture	oral examination and quiz
2nd week	1	Explain the term of human rights		Theoretical lecture	oral examination and quiz
3rd week	1	The historical of human rights		Theoretical lecture	oral examination and quiz
4th week	1	Development of human rights		Theoretical lecture	oral examination and quiz
5th week	1	Development of human rights		Theoretical lecture	oral examination and quiz
6th week	1	Development of human rights		Theoretical lecture	oral examination and quiz
7th week	1	Human rights and Sumerian civilization		Theoretical lecture	oral examination and quiz
8th week	1	Human rights in Roman civilization		Theoretical lecture	oral examination and quiz
9th week	1	Human rights in the Nile Valley civilization		Theoretical lecture	oral examination and quiz
10th week	1	Introduction to heavenly religions.		Theoretical lecture	oral examination and quiz
11th week	1	Human rights in Judaism		Theoretical lecture	oral examination and quiz
12th week	1	Human rights in the Christian religion		Theoretical lecture	oral examination and quiz
13th week	1	Human rights in the Islamic religion		Theoretical lecture	oral examination and quiz
14th week	1	Human rights in the Islamic religion		Theoretical lecture	oral examination and quiz
15th week	1	Comparison between other religions and Islam.		Theoretical lecture	oral examination and quiz
16th week	1	Democracy		Theoretical lecture	oral examination
17thweek	1	History of democracy		Theoretical lecture	oral examination
18th week	1	Democracy in Roman civilization		Theoretical lecture	oral examination
19th week	1	The development of democracy		Theoretical lecture	oral examination
20th week	1	The development of democracy		Theoretical lecture	oral examination
21th week	1	Types of democracies		Theoretical lecture	oral examination
22th week	1	Types of democracies		Theoretical lecture	oral examination
23th week	1	The difference between democracy and dictatorship		Theoretical lecture	oral examination
24th week	1	Types of political rule		Theoretical lecture	oral examination
25th week	1	Types of political rule		Theoretical lecture	oral examination
26th week	1	The benefit of democracy for public life		Theoretical lecture	oral examination

27th week	1	The benefit of democracy for public life		Theoretical lecture	oral examination
28th week	1	Arab democracies		Theoretical lecture	oral examination
29th week	1	Arab democracies		Theoretical lecture	oral examination
30th week	1	Democracy and Islam		Theoretical lecture	oral examination

11. Course Evaluation

First semester 20% second semester 20%, activities 10% final exam 50%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Human Rights book
Main references (sources)	The organization of human rights magazine
Recommended books and references (scientific journals, reports…)	

Course Description Form

1. Course Name:	
Principles of logic circuits	
2. Course Code:	
Digital circuit	
3. Semester / Year:	
First year	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Thoalfukar Husseini Email: thoalfukar@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Know about logic circuits and their importance in scientific progress, in addition to their connection to other sciences. 2. Student will also be able to design different logic circuits and distinguish between the logic gates. 3. In addition, the student will be able to deal with different logic equations in terms of their application simplification. 4. Moreover, the student will be able to perform conversion operations between different digital systems**.**
9. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include most of the questions that can be asked about the topic and will be answered during the lecture. Students will be taken through a discussion in order to find the pre answers to those questions. This is followed by a detailed explanation of the topic by which many examples and solutions are given. Moreover, the lecture includes different educational videos which would virtually clarify the topic. At the end of the lecture, and to ensure that all students have understood the basics of the topic, students are discussed by various questions. On the other hand, during the practical lecture, the students are given the lecture as mentioned above, in addition to the practical application, which includes connecting the logic circuits and recording the data obtained from the circuit in order to be compared with the theoretical results, and then writing a detailed report on the experiment and its results.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	A general idea of numerical systems (types and details)		Theoretical lecture	oral examination and quiz
2nd week	2hr	Transfers between the numerical systems		Theoretical lecture	oral examination and quiz
3rd week	2hr	Logic gates (types, working principle, truth tables, logical symbol)		Theoretical lecture	oral examination and quiz
4th week	2hr	How to connect the logic gates to form logic circuits.		Theoretical lecture	oral examination and quiz
5th week	2hr	Boolean algebra and the rule of de-Morgan		Theoretical lecture	oral examination and quiz
6th week	2hr	Simplification of logical equations using Boolean algebra and the laws of De Morgan's laws.		Theoretical lecture	oral examination and quiz
7th week	2hr	The design of the logical gates using NOR and NAND circuits,		Theoretical lecture	oral examination and quiz
8th week	2hr	Ways of writing the equation from truth table (POS, SOP).		Theoretical lecture	oral examination and quiz
9th week	2hr	Karnaugh Map (for two variables, the three variables, the four variables)		Theoretical lecture	oral examination and quiz
10th week	2hr	Simplification of logical equations using Karnaugh Map		Theoretical lecture	oral examination and quiz
11th week	2hr	Calculations in the binary system (addition, subtraction, subtraction using complements).		Theoretical lecture	oral examination and quiz
12th week	2hr	Logic circuit applications (half adder, full adder, parallel adder circuits)		Theoretical lecture	oral examination and quiz
13th week	2hr	Binary subtractor circuits (half subtractor, full subtractor parallel subtractor) circuit using the adder circuit by method of 1s complements.		Theoretical lecture	oral examination and quiz
14th week	2hr	The circuit of digital comparator (one stage and two stages)		Theoretical lecture	oral examination and quiz
15th week	2hr	The circuit of decoder size of 2:4 ,3:8 and 4:10		Theoretical lecture	oral examination and quiz
16th week	2hr	The circuit of encoder size of 4:2, 8:3 and 10:4		Theoretical lecture	oral examination and quiz
17th week	2hr	Introduction to sequential logic circuits, a general idea of the Flip Flop, flip flop type (S-R).		Theoretical lecture	oral examination and quiz
18th week	2hr	The flip flop type J-K and master slave flip flop		Theoretical lecture	oral examination and quiz
19th week	2hr	The D- flip flop and T flip flop		Theoretical lecture	oral examination and quiz
20th week	2hr	The registers, design of registers, enter the information and output from registers		Theoretical lecture	oral examination and quiz
21st week	2hr	The shift register, shift to left, shift to right		Theoretical lecture	oral examination and quiz
22nd week	2hr	The counter- asynchronous counter		Theoretical lecture	oral examination and quiz
23rd week	2hr	The synchronous counter- the cycle counter		Theoretical lecture	oral examination and quiz
24th week	2hr	The multiplexer and its applications		Theoretical lecture	oral examination and quiz
25th week	2hr	The code convertor – the application of code convertor		Theoretical lecture	oral examination and quiz

26th week	2hr	Programmable logic array: Concepts of programmable logic array (PLA); Concepts of programmable array logic (PAL)		Theoretical lecture	oral examination and quiz
27th week	2hr			Theoretical lecture	oral examination and quiz
28th week	2hr	Buffers, non-inverting buffers, inverting buffers, Tri-state buffers, transmission gates		Theoretical lecture	oral examination and quiz
29th week	2hr	Introduction to Sequential logic latches and flip flops, Latches-Edge triggered flip flop, Flip-flop operating characteristics, Flip-flop applications		Theoretical lecture	oral examination and quiz
30th week	2hr	Introduction To State Machine Design,		Theoretical lecture	oral examination and quiz

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Deriving the truth table of NOT-AND-OR Gates using Switches		practical lecture	oral examination and writing report
2nd week	2hr	Deriving the truth table of NOT-AND-OR Gates using diodes and transistors		practical lecture	oral examination and writing report
3rd week	2hr	Deriving the truth table of NOT-AND-OR Gates using diodes and transistors		practical lecture	oral examination and writing report
4th week	2hr	NOR-and NANAD Gates using diodes and transistors		practical lecture	oral examination and writing report
5th week	2hr	EX-OR and EX-NOR Gates		practical lecture	oral examination and writing report
6th week	2hr	Demorgan's first and second law		practical lecture	oral examination and writing report
7th week	2hr	Deriving the basic gates from NAND gate using circuit of NAND gate		practical lecture	oral examination and writing report
8th week	2hr	Deriving the basic gates from NOR gate using circuit of NOR gate		practical lecture	oral examination and writing report
9th week	2hr	Deriving the EX-OR gate from NAND gate and NOR gate		practical lecture	oral examination and writing report
10th week	2hr	Comparator circuit with one rank		practical lecture	oral examination and writing report
11th week	2hr	Comparator circuit with two ranks		practical lecture	oral examination and writing report
12th week	2hr	Comparator circuit with four numbers using IC 7485		practical lecture	oral examination and writing report
13th week	2hr	Conversion circuit from Binary to Decimal number		practical lecture	oral examination and writing report
14th week	2hr	Conversion circuit from Decimal to Binary number		practical lecture	oral examination and writing report
15th week	2hr	Half adder circuit using different gates and NAND gate		practical lecture	oral examination and writing report
16th week	2hr	Half Subtractor circuit using different gates and NAND gate		practical lecture	oral examination and writing report
17th week	2hr	Full adder circuit		practical lecture	oral examination and writing report
18th week	2hr	Full subtractor circuit		practical lecture	oral examination and writing report
19th week	2hr	Using IC to add two binary numbers with four bit and to subtract two binary numbers with four bit		practical lecture	oral examination and writing report
20th week	2hr	R-S filp0flop using NANAD and NOR Gates		practical lecture	oral examination and writing report
21st week	2hr	R-S-T flip flop		practical lecture	oral examination and writing report

22nd week	2hr	D-type flip flop using R-S		practical lecture	oral examination and writing report
23rd week	2hr	T-type flip flop using R-S		practical lecture	oral examination and writing report
24th week	2hr	JK flip flop from RS flip flop		practical lecture	oral examination and writing report
25th week	2hr	Master-slave flip flop		practical lecture	oral examination and writing report
26th week	2hr	D and T flip flop from Master – slave		practical lecture	oral examination and writing report
27th week	2hr	Generation of square waves using R-S flip flop		practical lecture	oral examination and writing report
28th week	2hr	Ascending Wavy Counter		practical lecture	oral examination and writing report
29th week	2hr	Descending Wavy Counter		practical lecture	oral examination and writing report
30th week	2hr	Conversion		practical lecture	oral examination and writing report

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:

5. **Theoretical:**
    a. First semester = 10 marks
    b. Second semester= 10 marks
6. **Practical:**
    a. Fiest semester= 10 marks
    b. Second semester= 10 marks
7. **daily oral and preparation= 10 Marks**
8. **Final exam**
    a. Theoretical=40 marks
    b. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Digital electronics and its applications - Malvino
Main references (sources)	Digital electronics and its applications - Malvino
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the logic circuits topics
Electronic References, Websites	https://stackexchange.com/

Course description

1. Course Name	
Laboratories (electronic + electricity)	
2. Course Code	
M.K., M.L.	
3. Semester/Year	
First Year	
4. Date of preparation of this description	
02\02\2024	
5. Available Attendance Forms	
a. Practical lectures b. Scientific visits	
6. Number of credit hours (total) / number of units (total)	
120 Hours / 7 Units	
7. Course administrator's name (if more than one name)	
Name: ALALean:	
8. Course Objectives	
Course Objectives	□ The student learns about electrical measuring devices and how they work. □ Identify the types of resistors and amplitudes, methods of reading and examining them, and how to connect them. □ Learns how to connect electrical circuits and place them in a printed board**.** □ Learn how to use caustics and types of caustics used in the workshop. □ Semiconductor examination.
Teaching and learning strategies	
Strategy	1. Discuss students and ask questions about the topic of the lecture and how to think critically and analytically and then direct them towards how to solve the problem in a manner commensurate with the topic. 2. Explain the material in a consistent manner commensurate with the inquiries and preliminary discussions of the topic in addition to the use of available means of illustration that help to consolidate the lesson such as the use of scenes filmed on websites and realistic examples in addition to addressing many solved examples. 3. Use feedback and evaluate the student's comprehension of the material.

11. Course Structure					
Practical					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first	4	Principles of industrial safety inside electrical workshops - protection from electric shock - identification of the tools used inside the electrical workshop - sources of power - training on the use of the oven - micrometer to measure the wires used in the coil.	Industrial Security	Lectures	Tests+Weekly Reports
Second	4	The method of using different types of soldering irons - point welding irons.	Types of caustic	Lectures	Tests +Weekly Reports
Third, fourth and fifth	4	Electrical transformers - types - magnetic circuit - electrical circuits - opening the transformer - taking information from the old transformer for primary and secondary coils - measuring the wire diameters of the transformer - measuring the plastic winding mold - rewinding the primary and secondary coils.	Transformers	Lectures	Tests +Weekly Reports
Sixth and seventh	4	Types of electric motors (single and three-phase) - shaded pole motor (small water pump motor) engine work - dismantling - taking information - making the mold - winding the coils - placing insulators - connecting the ends - bandage - varnish insulation - inspection and testing - malfunctions that may occur in the engine (electrical and mechanical).	Engines	Lectures	Tests +Weekly Reports
Eighth	4	Electrical installations - types - burial inside pipes - Siemens foundation. - Draw a lamp foundation circle with a control circle. - Practical exercise on the establishment of the department.	Foundations	Lectures	Tests+Weekly Reports
Ninth	4	Draw a circle establishing two lamps in parallel with a switch with a socket. Apply the circuit in practice. Drawing of the internal connection of the fluorescent lamp circuit. Replace one of the lamps with a fluorescent lamp.	Drawing circle foundation two lamps	Lectures	Tests + Weekly Reports
X	4	Drawing a foundation circle (lamp ladder) two methods using a two-way switch - practical application of the circuit.	Drawing circle foundation lamp ladder	Lectures	Tests+Weekly Reports
Eleventh	4	Identify electrical collectors - their types - their use - thermal follow-ups - time situation.	Electrical collectors and follow-ups	Lectures	Tests + Weekly Reports

Twelfth	4	Operation of a single-sided motor by an antenna pickup with push button.	Single-faced motor	Lectures	Tests + Weekly Reports
Thirteenth	4	Engine operation and rotation direction change of single-phase motor using collectors and timer.	Single-phase motor operation	Lectures	Tests + Weekly Reports
Fourteenth	4	Training on the work of electrical installations (foundation inside pipes)	Establishment in tube	Lectures	Tests + Weekly Reports
Fifteenth	4	The process of cutting pipes - working teeth - bending pipes - using pull springs.	Pipe cutting process	Lectures	Tests + Weekly Reports
Sixteenth	4	The different types of switches used in electronic devices and the methods of examining them - the current borne by each key - the use of each type. Types of fuses used in electronic circuits – types and diameters of wires used in fuses – the current that each type bears – how to repair fuses.	Keys	Lectures	Tests+Weekly Reports
Seventeenth	4	Files – their types – methods of examination – their uses – identification of faults – reading the types of files that use color codes and numbering. Electrical transformers - their types - methods of examination - determining the type of transformer - self-transformer - the difference between self-transformers and ordinary transformers.	Files and their types	Lectures	Tests+Weekly Reports
Eighteenth	4	The different types of semiconductors (diode, transistor, .. etc) in terms of how they are manufactured, the materials used in their manufacture, methods of numbering and finding equivalents.	Semiconductors	Lectures	Tests+Weekly Reports
Nineteenth	4	Semiconductor examination (diode, transistor, ... etc) idle and valid for a group of them.	Semiconductor Inspection	Lectures	Tests+Weekly Reports
Twentieth	4	Integrated circuits – Identify the numbering of the parties for several types of these circuits – how these circuits are made – the components involved in manufacturing.	Integrated Electronic Circuits	Lectures	Tests + Weekly Reports
Twenty-first	4	Presentation of a scientific film on how to manufacture electronic components (resistors, capacitators, transistors, ... etc).	Film Screening	Lectures	Tests+Weekly Reports
Twenty-second	4	How to read electronic maps and track circuits to determine the location of the malfunction and its causes.	How to read maps	Lectures	Tests+Weekly Reports
Twenty-third	4	The student learned how to design electronic circuits on the board and install electronic components on it – how to weld these components to the board (simple circle).	How to design electronic circuits	Lectures	Tests+Weekly Reports
Twenty-fourth	4	The previous work is repeated by the student designing a more complex circle.	Electronic circuit design	Lectures	Tests+Weekly Reports
Twenty-fifth	4	Examination of semiconductors-transistors and idle diode and fit for a group of them.	Semiconductor Inspection	Lectures	Tests+Weekly Reports
Twenty-sixth	4	A field visit to one of the industrial facilities in the socialist sector.	Field visit	Lectures	Tests+Weekly Reports
27^{th} -28^{th}	4	Building complex and simple electronic circuits on printed boards and learning how to examine and test them, such as a filter circuit.	Building circles on printed panels	Lectures	Tests+Weekly Reports

29th	4	Building a unified half-wave circuit on the printed board and learning how to examine and test it.	Build a unified semi-directed circuit	Lectures	Tests+Weekly Reports
30th	4	Build the full wave circuit on the printed board and learn how to examine and test it.	Full wave circuit construction on printed board	Lectures	Tests+Weekly Reports

12. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports .... etc	
13. Learning and Teaching Resources	
Required textbooks (methodology, if any)	Radio Laboratories Book + Electricity Laboratories Book
Main references (sources)	Hardware Maintenance Book
Recommended books and references (scientific journals, reports...)	Taking some films from scientific websites and showing them to the student and clarifying them
Electronic References, Websites	There isn't any

Course Description Form

1. Course Name:	
Communication	
2. Course Code:	
c	
3. Semester / Year:	
Second semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 hours/ 6 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Ruwaida Abdul Ameer Abdul Kreem Email: ruwaida.abdulkareem.iba@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Identify the basic principles of communications systems, both wired and wireless. 2. Learn about the methods of transferring information in communications systems, their specifications and features, and the types and methods of embedding used 3. Recognizes the various types of radio, television and telephone systems **4.** Learns how to connect and operate communications circuits
9.Teaching and Learning Strategies	
Strategy	1-Explaining the study material in a way that suits the students'levels in the class through simple explanati illustrations, and appropriate examples to convey the idea clearly and distinctly. 2-Use the discussion strategy to discuss the questions raised during the lecture. 3-Use a cooperative learning strategy to solve homework. 4-Use the feedback method during the lecture to determine the extent of the student's understanding of the st material. 5-Using surprise exams to evaluate students' level.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Filters (BPF)-(HPF)-(LPF) -(BSF)-(RC)	Filters	Theoretical lecture	oral examination and quiz
2nd week	2hr	Active filter (BPF)-(HPF)-(LPF) - (BSF).	Active filter	Theoretical lecture	oral examination and quiz
3rd week	2hr	Modulation, types, AM modulation, wave analysis.	Modulation	Theoretical lecture	oral examination and quiz
4th week	2hr	Spectrum frequency, power distributed, calculate modulation.	Spectrum frequency	Theoretical lecture	oral examination and quiz
5th week	2hr	Types of AM with its spectrum.	Types of AM	Theoretical lecture	oral examination and quiz
6th week	2hr	Types of modulation used to generate AM.	Types of modulation	Theoretical lecture	oral examination and quiz
7th week	2hr	Detector of AM- distortion in demodulation circuits-Envelope (AGC)-Synchronous Detector- Detector.	Detector of AM	Theoretical lecture	oral examination and quiz
8th week	2hr	Block diagram for transmitting and receiving AM-sensitivity of receiving device.	Block diagram for transmitting and receiving	Theoretical lecture	oral examination and quiz
9th week	2hr	FM modulation-PM modulation mathematic analysis for modulated waves-modulation ratio-frequency deviation.	FM modulation-	Theoretical lecture	oral examination and quiz
10th week	2hr	The width of spectrum frequency for FM and PM	width of spectrum frequency	Theoretical lecture	oral examination and quiz
11th week	2hr	Types of FM generation-Secttreo FM –(Stero)	Types of FM generation	Theoretical lecture	oral examination and quiz
12th week	2hr	Some types of Detector of FM	Detector of FM	Theoretical lecture	oral examination and quiz
13th week	2hr	Coding –Sampling-Quantization-Coding transform	Coding	Theoretical lecture	oral examination and quiz
14th week	2hr	PM-PCM-PPM-PDM and PAM	PM Modulation	Theoretical lecture	oral examination and quiz
15th week	2hr	TDM-FDM-Multiplexing	Multiplexing	Theoretical lecture	oral examination and quiz
16th week	2hr	PSK-FSK-ASK modulation	Keying Modulation	Theoretical lecture	oral examination and quiz
17th week	2hr	Transmission information-signal to noise ratio-noise	Transmission information	Theoretical lecture	oral examination and quiz
18th week	2hr	Mobile-FDMA-TDMA-CDMA	Mobile and Technologies	Theoretical lecture	oral examination and quiz
19th week	2hr	Teleprinters-telegraph	Teleprinters	Theoretical lecture	oral examination and quiz
20th week	2hr	Telex- (Fas-Receiver)- Faximile Transmission	Receiver-Transmission	Theoretical lecture	oral examination and quiz
21th week	2hr	Optic fiber-types-properties	Optic fiber	Theoretical lecture	oral examination and quiz
22th week	2hr	Types of antennae –fundamentals of antenna-factor of antenna	Types of antenna–fundamentals	Theoretical lecture	oral examination and quiz
23th week	2hr	Propagation of radio signal	Propogation of radio signal	Theoretical lecture	oral examination and quiz

24th week	2hr	Some types of antennas	types of antennae	Theoretical lecture	oral examination and quiz
25h week	2hr	Using of Microwave in communication	Microwave	Theoretical lecture	oral examination and quiz
26th week	2hr	Satellite- properties and advances-receiving and transmitting- orbits of satellite- multiple access.	Satellite	Theoretical lecture	
27th week	2hr	Microwaves- generations- frequency spectrum	Microwaves-generations	Theoretical lecture	
28th week	2hr	Mobile-introduction-principles-technics-wireless	Mobile-introduction-	Theoretical lecture	
29th week	2hr	GSM-function-structure	GSM	Theoretical lecture	
30th week	2hr	Thuraya device	Thuraya	Theoretical lecture	

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Filters (BPF)-(HPF)-(LPF) -(BSF)-(RC)	Filters	practical lecture	oral examination and writing report
2nd week	2hr	Active filter (BPF)-(HPF)-(LPF) - (BSF).	Active filter	practical lecture	oral examination and writing report
3rd week	2hr	Modulation, types, AM modulation, wave analysis.	Modulation	practical lecture	oral examination and writing report
4th week	2hr	Spectrum frequency, power distributed, calculate modulation.	Spectrum frequency	practical lecture	oral examination and writing report
5th week	2hr	Types of AM with its spectrum.	Types of AM	practical lecture	oral examination and writing report
6th week	2hr	Types of modulation used to generate AM.	Types of modulation	practical lecture	oral examination and writing report
7th week	2hr	Detector of AM- disturtion in demodulation circuits-Envelope (AGC)-Synchronous Detector- Detector.	Detector of AM	practical lecture	oral examination and writing report
8th week	2hr	Block diagram for transmiting and receiving AM-sensitivity of receiving device.	Block diagram for transmiting and receiving	practical lecture	oral examination and writing report
9th week	2hr	FM modulation-PM modulation mathematic analysis for modulated waves-modulation ratio-frequency deviation.	FM modulation-	practical lecture	oral examination and writing report
10th week	2hr	The width of spectrum frequency for FM and PM	width of spectrum frequency	practical lecture	oral examination and writing report
11th week	2hr	Types of FM generation-Secttreo FM –(Stero)	Types of FM generation	practical lecture	oral examination and writing report
12th week	2hr	Some types of Detectors of FM	Detector of FM	practical lecture	oral examination and writing report
13th week	2hr	Coding –Sampling-Quantization-Coding transform	Coding	practical lecture	oral examination and writing report

14th week	2hr	PM-PCM-PPM-PDM and PAM	PM Modulation	practical lecture	oral examination and writing report
15th week	2hr	TDM-FDM-Multiplexing	Multiplexing	practical lecture	oral examination and writing report
16th week	2hr	PSK-FSK-ASK modulation	Keying Modulation	practical lecture	oral examination and writing report
17th week	2hr	Transmission information-signal to noise ratio-noise	Transmission information	practical lecture	oral examination and writing report
18th week	2hr	Mobile-FDMA-TDMA-CDMA	Mobile and Technologies	practical lecture	oral examination and writing report
19th week	2hr	Teleprinters-telegraph	Teleprinters	practical lecture	oral examination and writing report
20th week	2hr	Telex- (Fas-Receiver)- Faximile Transmission	Receiver-Transmission	practical lecture	oral examination and writing report
21th week	2hr	Optic fiber-types-properties	Optic fiber	practical lecture	oral examination and writing report
22th week	2hr	Types of antenna –fundamentals of antenna-factor of antenna	Types of antennae–fundamentals	practical lecture	oral examination and writing report
23th week	2hr	Propogation of radio signal	Propagation of radio signal	practical lecture	oral examination and writing report
24th week	2hr	Some types of antenna	types of antennae	practical lecture	oral examination and writing report
25th week	2hr	Using of Microwave in communication	Microwave	practical lecture	oral examination and writing report
26th week	2hr	Satellite- properties and advances-receiving and transmitting- orbits of satellite- multiple access.	Satellite	practical lecture	oral examination and writing report
27th week	2hr	Microwaves- generations- frequency spectrum	Microwaves-generations	practical lecture	oral examination and writing report
28th week	2hr	Mobile-introduction-principles-technics-wireless	Mobile-introduction-	practical lecture	oral examination and writing report
29th week	2hr	GSM-function-structure	GSM	practical lecture	oral examination and writing report
30th week	2hr	Thuraya device	Thuraya	practical lecture	oral examination and writing report

11. Course Evaluation

the Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
   a. First semester = 10 marks
   b. Second semester= 10 marks
2. **Practical:**
   a. Fiest semester= 10 marks
   b. Second semester= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
   a. Theoretical=40 marks

Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1-Electronic communication. Dennis- Riddy 2-Modulation. Conner 3-Principle of Communication Systems Tuab&Segilling. 4- Telecommunication for Technition.
Main references (sources)	1-D. Blake, "Introduction to Communication Systems," 8/16/01. 2-A. B. Carlson and P. B. Crilly, COMMUNICATION SYSTEMS: An Introduction to Signals and Noise in Electrical Communication, 5th ed., McGraw-Hill. 3-"Electronics Projects Focus," Elprocus, 2013. [Online]. Available: https://www.elprocus.com/what-is-multiplexing-types-and-their-applications/. [Accessed 14 May 2020].
Recommended books and references (scientific journals, reports…)	Satellite communication
Electronic References, Websites	https://stackexchange.com/

Course Description Form

1. Course Name:	
Electronic measurement devices	
2. Course Code:	
EMD	
3. Semester / Year:	
Second Year	
4. Description Preparation Date:	
04/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Asmaa Adnan Email: asmaa.najm@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Understands electrical measurement devices and how they operate. 2. Familiarizes themselves with maintenance methods for electrical measurement devices. **3.** Learns how to connect and operate electrical circuits.**.**
9. Teaching and Learning Strategies	
Strategy	1. **Student Discussion and Questioning:** • Engage students in discussions, encouraging them to pose questions related to the lecture topic • Foster critical and analytical thinking, guiding them towards problem-solving approaches alig with the subject. 2. **Material Explanation and Visual Aids:** • Present the content coherently, addressing initial inquiries and primary discussions. • Utilize available visual aids for clarification, including illustrated materials on websites and r world examples. • Incorporate practical demonstrations to enhance understanding. 3. **Feedback and Assessment:** • Implement feedback loops to evaluate students' grasp of the material. • Assess the extent of student comprehension through interactive discussions and participation. • Utilize real-life scenarios and solved examples to reinforce the lesson.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Classification of Devices, Signal Devices, and their Foundations: Types of Torque: Influential Torque, Deflecting Torque, Balancing Torque, Residual Torque. Devices with Moving Coils: D'Arsonval Movement as a Current and Voltage Meter, Structure, and Torque Equations.	Device classification	Theoretical lecture	oral examination and quiz
2nd week	2hr	Devices with Moving Coils - D'Arsonval Movement as a Current and Voltage Meter: Structure and Torque Equations	Measuring devices	Theoretical lecture	oral examination and quiz
3rd week	2hr	Galvanometer - sensitivity of the calorimeter - final deviation - motor behavior - decay.	Galvanometer	Theoretical lecture	oral examination and quiz
4th week	2hr	AC ammeter - resistance in parallel with it. Examples of a resistive voltmeter for an oven on a bathroom with a sensitive voltmeter.	Resistance in parallel	Theoretical lecture	oral examination and quiz
5th week	2hr	Resistance measurement - voltmeter method - ohmmeter device - type - balance.	Straight resistance	Theoretical lecture	oral examination and quiz
6th week	2hr	Differential Avometer - Renewal of AC devices.	Avometer	Theoretical lecture	oral examination and quiz
7th week	2hr	AC current measuring devices - electrodynamometer - installation - moment equation.	AC current measuring devices	Theoretical lecture	oral examination and quiz
8th week	2hr	Iron measuring devices - installation - animation equations - moments - advantages - equality.	installation	Theoretical lecture	oral examination and quiz
9th week	2hr	Decibel measuring devices.	Decibel measuring devices	Theoretical lecture	oral examination and quiz
10th week	2hr	Use of electrodanometer - Jodi phase power meter - installation - with deflection angle equalizer.	Electrodanometer	Theoretical lecture	oral examination and quiz
11th week	2hr	Frequency meter - installation and starts working.	Frequency scale	Theoretical lecture	oral examination and quiz
12th week	2hr	Al-Mujahid - Renewal of voltmeter and ammeter.	For stress	Theoretical lecture	oral examination and quiz
13th week	2hr	Thermocouple devices.	Thermal devices	Theoretical lecture	oral examination and quiz
14th week	2hr	AC bridges - Wheatstone bridge work - Measurement errors - Effect of conducting wires - Double Kelvin bridge	DC bridges	Theoretical lecture	oral examination and quiz
15th week	2hr	Oscilloscope basics - block diagram - aircraft valve - installation - screen - cathode valve connections.	Oscilloscope basics	Theoretical lecture	oral examination and quiz
16st week	2hr	Vertical deflection system as a function - input selector, vertical magnifier, scanning line, selection function - types of analysis - horizontal deflection system - basic sweep generator - nitrous sweep - mug sweep - horizontal magnifier -	Magnifier	practical lecture	oral examination and writing report

		oscilloscope sensors - passive filament sensors - mullite sensors.			
17nd week	2hr	Lissajous problem - phase calculation - frequency calculation.	The whims	practical lecture	oral examination and writing report
18rd week	2hr	Dual oscillatory radiation buffer head.	Signal plotter	practical lecture	oral examination and writing report
19th week	2hr	Electronic measuring devices - electronic voltmeter - basic circuit - transistor type - electronic millimeter.	Electronic measuring devices	practical lecture	oral examination and writing report
20th week	2hr	Electronic measuring devices - electronic voltmeter - basic circuit - transistor type - electronic millimeter.	Electronic measuring devices	practical lecture	oral examination and writing report
21th week	2hr	Considerations in choosing an electronic voltmeter - input impedance - voltage ranges - decibels - sensitivity with bandwidth - AC current measurement.	Voltmeter	practical lecture	oral examination and writing report
22th week	2hr	Digital voltmeter - general specifications - component gradient type - balance Darfur.	Voltmeter	practical lecture	oral examination and writing report
23th week	2hr	Devices used to control sensitivity on measuring devices.	Electronic measuring devices	practical lecture	oral examination and writing report
24th week	2hr	IEEE488 interface circuit (electric switch).	The electric gearbox	practical lecture	oral examination and writing report
25th week	2hr	Description of digital control of timing signal in measurement based on attenuation.	Digital control	practical lecture	oral examination and writing report
26th week	2hr	AC ammeter - resistance in parallel with it. Examples of a resistive voltmeter for an oven on a bathroom with a sensitive voltmeter.	Resistance in parallel	practical lecture	oral examination and writing report
27th week	2hr	Resistance measurement - voltmeter method - ohmmeter device - type - balance.	Straight resistance	practical lecture	oral examination and writing report
28th week	2hr	Differential Avometer - Renewal of AC devices.	Avometer	practical lecture	oral examination and writing report
29th week	2hr	AC current measuring devices - electrodynamometer - installation - moment equation.	AC current measuring devices	practical lecture	oral examination and writing report
30th week	2hr	Iron measuring devices - installation - animation equations - moments - advantages - equality.	installation	practical lecture	oral examination and writing report
Practical					
Week	**Hours**	Required Learning Outcomes	Measuring devices	Learning method	Evaluation method

1st week	2hr	Classification of devices, indicating devices and the foundations based on them, types of acting torques - deflection torques - balance torques - diminishing torques.	Galvanometer	practical lecture	oral examination and writing report
2nd week	2hr	Moving coil measuring devices - d'Arsonval movement as a measure of current and voltage - composition - moment equations.	Resistance in parallel	practical lecture	oral examination and writing report
3rd week	2hr	Galvanometer - galvanometer sensitivity - final deviation - kinetic behavior - decay mechanism.	Straight resistance	practical lecture	oral examination and writing report
4th week	2hr	DC ammeter - resistance in parallel with it. Examples of DC voltmeter - resistance in series with it - sensitivity of voltmeter.	Avometer	practical lecture	oral examination and writing report
5th week	2hr	Resistance measurement - ammeter-voltmeter method - ohmmeter device - series type - parallel type.	AC current measuring devices	practical lecture	oral examination and writing report
6th week	2hr	Differential chart amplifier - calibration of direct current devices.	installation	practical lecture	oral examination and writing report
7th week	2hr	Alternating current measuring devices - electrodynamometer - installation - moment equation.	Decibel measuring devices	practical lecture	oral examination and writing report
8th week	2hr	Measuring devices with moving iron - installation - moment equations - advantages - equality.	Electrodanometer	practical lecture	oral examination and writing report
9th week	2hr	Decibel measuring devices.	Frequency scale	practical lecture	oral examination and writing report
10th week	2hr	Use of the electrodanometer - single-phase power meter - composition - deflection angle equation.	For stress	practical lecture	oral examination and writing report
11th week	2hr	Frequency meter--installation and working principle.	Thermal devices	practical lecture	oral examination and writing report
12th week	2hr	Stress-calibration of voltmeter and ammeter.	DC bridges	practical lecture	oral examination and writing report
13th week	2hr	Thermal devices - thermocouple device.	Oscilloscope basics	practical lecture	oral examination and writing report
14th week	2hr	DC bridges - Wheatstone bridge, working principle - Measurement errors - Effect of conducting wires - Double Kelvin bridge	Magnifier	practical lecture	oral examination and writing report
15th week	2hr	Oscilloscope basics - block diagram - cathode ray valve - installation - screen - cathode ray valve connections.	The whims	practical lecture	oral examination and writing report

16st week	2hr	Vertical deflection system Functional diagram - input selector molar vertical amplifier - delay line, delay line function - types of delay line - horizontal deflection system - basic sweep generator - sweep synchronizer - sweep mug - horizontal amplifier - oscilloscope sensors - passive voltage sensors - sensors High voltages.	Signal plotter	practical lecture	oral examination and writing report
17nd week	2hr	Lissajous problem - phase calculation - frequency calculation.	Electronic measuring devices	practical lecture	oral examination and writing report
18rd week	2hr	Dual radiation oscilloscope - storage oscilloscope.	Electronic measuring devices	practical lecture	oral examination and writing report
19th week	2hr	Electronic measuring devices - electronic voltmeter - basic circuit - transistor type - electronic millimeter.	Voltmeter	practical lecture	oral examination and writing report
20th week	2hr	Electronic measuring devices - electronic voltmeter - basic circuit - transistor type - electronic millimeter.	Voltmeter	practical lecture	oral examination and writing report
21th week	2hr	Considerations in choosing an electronic voltmeter - input impedance - voltage ranges - decibels - sensitivity with bandwidth - current measurement.	Electronic measuring devices	practical lecture	oral examination and writing report
22th week	2hr	Digital voltmeter - general specifications - regression type, integration type - constant balance.	The electric gearbox	practical lecture	oral examination and writing report
23th week	2hr	Devices used to control the sensitivity of measuring devices.	Digital control	practical lecture	oral examination and writing report
24th week	2hr	IEEE488 interconnect circuit (electric switch).	Resistance in parallel	practical lecture	oral examination and writing report
25th week	2hr	Describe digital control with example timing signal in microprocessor based measurement.	Straight resistance	practical lecture	oral examination and writing report
26th week	2hr	DC ammeter - resistance in parallel with it. Examples of DC voltmeter - resistance in series with it - sensitivity of voltmeter.	Avometer	practical lecture	oral examination and writing report
27th week	2hr	Resistance measurement - ammeter-voltmeter method - ohmmeter device - series type - parallel type.	AC current measuring devices	practical lecture	oral examination and writing report
28th week	2hr	Differential chart amplifier - calibration of direct current devices.	installation	practical lecture	oral examination and writing report
29th week	2hr	Alternating current measuring devices - electrodynamometer - installation - moment equation.	Device classification	practical lecture	oral examination and writing report
30th week	2hr	Measuring devices with moving iron - installation - moment equations - advantages - equality.	Measuring devices	practical lecture	oral examination

					and writing report

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
    a. First semester = 10 marks
    b. Second semester= 10 marks
2. **Practical:**
    a. Fiest semester= 10 marks
    b. Second semester= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
    a. Theoretical=40 marks
    b. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Electronic measuring devices and measuring techniques
Main references (sources)	Written by Hani Aziz, Abdullah Muhammad Gabriel Jesus
Recommended books and references (scientific journals, reports...)	Electronic devices and measurement techniques
Electronic References, Websites	https://stackexchange.com/

Course Description Form

1. Course Name:	
Computer's Applications	
2. Course Code:	
CA	
3. Semester / Year:	
Second semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
90 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Heba zuhair Email: heba.abdalkareem@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Teaching the student to be familiar with the basic rules for dealing with and managing a computer. 2. It helps him in completing projects, printing matters, creating presentations, and designing engineering plan **3.** The student learns to use the Internet in many fields, including education, scientific research, trade, marketing through electronic correspondence, web pages, and electronic communication.
9. Teaching and Learning Strategies	
Strategy	Live questions and answers about previous material Analyzing the student's ability to comprehend through homework, carried out at home and stored on the computer Discs to display directly in front of students to see how much they learned from the previous lecture- Showing educational films specific to the subject in order to consolidate the ability to learn, use feedback, and evaluate the extent of the student's understanding of the subject.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	1hr	Network concept	Network	Theoretical lecture	oral examination and quiz
2nd week	1hr	Types of networks and the concept of the Internet	Network	Theoretical lecture	oral examination and quiz
3rd week	1hr	Description of the main screen, its components, and how to connect to the global network	Network	Theoretical lecture	oral examination and quiz
4th week	1hr	Take advantage of different search engines	Network	Theoretical lecture	oral examination and quiz
5th week	1hr	Learn about ways to search for and access information	Network	Theoretical lecture	oral examination and quiz
6th week	1hr	Learn about the concept of Excel: its benefits and specifications	Excel	Theoretical lecture	oral examination and quiz
7th week	1hr	Identify the main screen and its components, including various menus and tools	Excel	Theoretical lecture	oral examination and quiz
8th week	1hr	Identify the main screen and its components, including various menus and tools	Excel	Theoretical lecture	oral examination and quiz
9th week	1hr	Identify the main screen and its components, including various menus and tools	Excel	Theoretical lecture	oral examination and quiz
10th week	1hr	The concept of the cell, basic data types and how to enter them	Excel	Theoretical lecture	oral examination and quiz
11th week	1hr	The concept of the cell, basic data types and how to enter them	Excel	Theoretical lecture	oral examination and quiz
12th week	1hr	How to save data Open the saved file.	Excel	Theoretical lecture	oral examination and quiz
13th week	1hr	enter data and perform calculations	Excel	Theoretical lecture	oral examination and quiz
14th week	1hr	Inserting various arithmetic functions	Excel	Theoretical lecture	oral examination and quiz
15th week	1hr	AutoCAD program: getting to know the program environment	AutoCAD	Theoretical lecture	oral examination and quiz
16th week	1hr	Preparing the drawing sheet, opening a new file, drawing borders, drawing units, network, jumping, storage	AutoCAD	Theoretical lecture	oral examination and quiz
17th week	1hr	Recognizing the different drawing commands, line, point...	AutoCAD	Theoretical lecture	oral examination and quiz
18th week	1hr	Recognizing the different drawing commands, line, point...	AutoCAD	Theoretical lecture	oral examination and quiz
19th week	1hr	Learn about modification commands	AutoCAD	Theoretical lecture	oral examination and quiz
20th week	1hr	Learn about modification commands	AutoCAD	Theoretical lecture	oral examination and quiz
21th week	1hr	Add dimensions	AutoCAD	Theoretical lecture	oral examination and quiz
22th week	1hr	Add texts and precise drawing sectors	AutoCAD	Theoretical lecture	oral examination and quiz

23th week	1hr	Control drawing specifications	AutoCAD	Theoretical lecture	oral examination and quiz
24th week	1hr	Introduction to 3D drawing	AutoCAD	Theoretical lecture	oral examination and quiz
25th week	1hr	Creating 3D surfaces	AutoCAD	Theoretical lecture	oral examination and quiz
26th week	1hr	Create 3D objects	AutoCAD	Theoretical lecture	oral examination and quiz
27th week	1hr	Create 3D objects	AutoCAD	Theoretical lecture	oral examination and quiz
28th week	1hr	Create 3D objects	AutoCAD	Theoretical lecture	oral examination and quiz
29th week	1hr	Create 3D objects	AutoCAD	Theoretical lecture	oral examination and quiz
30th week	1hr	Change the interface from 3D to 2D or classic	AutoCAD	Theoretical lecture	oral examination and quiz

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Network concept	Network	practical lecture	oral examination and writing report
2nd week	2hr	Types of networks and the concept of the Internet	Network	practical lecture	oral examination and writing report
3rd week	2hr	Description of the main screen, its components, and how to connect to the global network	Network	practical lecture	oral examination and writing report
4th week	2hr	Take advantage of different search engines	Network	practical lecture	oral examination and writing report
5th week	2hr	Learn about ways to search for and access information	Network	practical lecture	oral examination and writing report
6th week	2hr	Learn about the concept of Excel: its benefits and specifications	Excel	practical lecture	oral examination and writing report
7th week	2hr	Identify the main screen and its components, including various menus and tools	Excel	practical lecture	oral examination and writing report
8th week	2hr	Identify the main screen and its components, including various menus and tools	Excel	practical lecture	oral examination and writing report
9th week	2hr	Identify the main screen and its components, including various menus and tools	Excel	practical lecture	oral examination and writing report
10th week	2hr	The concept of the cell, basic data types and how to enter them	Excel	practical lecture	oral examination and writing report
11th week	2hr	The concept of the cell, basic data types and how to enter them	Excel	practical lecture	oral examination and writing report
12th week	2hr	How to save data Open the saved file.	Excel	practical lecture	oral examination and writing report
13th week	2hr	enter data and perform calculations	Excel	practical lecture	oral examination and writing report

14th week	2hr	Inserting various arithmetic functions	Excel	practical lecture	oral examination and writing report
15th week	2hr	AutoCAD program: getting to know the program environment	AutoCAD	practical lecture	oral examination and writing report
16th week	2hr	Preparing the drawing sheet, opening a new file, drawing borders, drawing units, network, jumping, storage	AutoCAD	practical lecture	oral examination and writing report
17th week	2hr	Recognizing the different drawing commands, line, point...	AutoCAD	practical lecture	oral examination and writing report
18th week	2hr	Recognizing the different drawing commands, line, point...	AutoCAD	practical lecture	oral examination and writing report
19th week	2hr	Learn about modification commands	AutoCAD	practical lecture	oral examination and writing report
20th week	2hr	Learn about modification commands	AutoCAD	practical lecture	oral examination and writing report
21th week	2hr	Add dimensions	AutoCAD	practical lecture	oral examination and writing report
22th week	2hr	Add texts and precise drawing sectors	AutoCAD	practical lecture	oral examination and writing report
23th week	2hr	Control drawing specifications	AutoCAD	practical lecture	oral examination and writing report
24th week	2hr	Introduction to 3D drawing	AutoCAD	practical lecture	oral examination and writing report
25th week	2hr	Creating 3D surfaces	AutoCAD	practical lecture	oral examination and writing report
26th week	2hr	Create 3D objects	AutoCAD	practical lecture	oral examination and writing report
27th week	2hr	Create 3D objects	AutoCAD	practical lecture	oral examination and writing report
28th week	2hr	Create 3D objects	AutoCAD	practical lecture	oral examination and writing report
29th week	2hr	Create 3D objects	AutoCAD	practical lecture	oral examination and writing report
30th week	2hr	Change the interface from 3D to 2D or classic	AutoCAD	practical lecture	oral examination and writing report

11. Course Evaluation

the Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
    a. First semester = 10 marks
    b. Second semester= 10 marks
2. **Practical:**
    a. Fiest semester= 10 marks
    b. Second semester= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
    a. Theoretical=40 marks
    b. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	AutoCAD
Main references (sources)	AutoCAD
Recommended books and references (scientific journals, reports...)	AutoCAD
Electronic References, Websites	https://stackexchange.com/

Course Description Form

1. Course Name:	
Electronic Circuits	
2. Course Code:	
EC	
3. Semester / Year:	
Second year	
4. Description Preparation Date:	
05/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
240 hours/ 8 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Alaa Hadi Mohammed Email: alaa.musa@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Know about the methods of the electronic circuits design. 2. Student to be able to build and operate the electronic circuits on the practical breadboard. **3.** Student to be able to make use form the academic studying in marketing**.**
9. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include most of the questions that can be asked about the topic and will be answered during the lecture. Students will be taken through a discussion to find the pre-answers to those questions. This is followed by a detailed explanation of the topic by which many examples and solutions are given. Moreover, the lecture includes different educational videos which would virtually clarify the topic. At the end of the lecture, and to ensure that all students have understood the basics of the topic, students are discussed by various questions. On the other hand, during the practical lecture, the students are given the lecture as mentioned above, in addition to the practical application, which includes connecting the electronic circuits and recording the data obtained from the circuit to be compared with the theoretical results, and then writing a detailed report on the experiment and its results.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	4hr	Power supplies: 1- Using a variable resistor. 2- Using a transistor with variable resistance.	Power supplies	Theoretical lecture	oral examination and quiz

		3- Using a Darlington connection with a variable resistance.			
2nd & 3rd weeks	4hr	Voltage regulators: parallel voltage regulator with the derivation of its equation - series voltage regulator with the derivation of its equations. Examples of the two topics	Voltage regulators	Theoretical lecture	oral examination and quiz
4rd week	4hr	Thyristor: its structure and properties, its symbol. Representing the thyristor by two transistors (ideal latch). The circuit and the idea of work.	Thyristor	Theoretical lecture	oral examination and quiz
5th week	4hr	Diac and Triac: structure, symbol, and characteristics. Applications on flashing, protection, and alarm.	Diac and Triac	Theoretical lecture	oral examination and quiz
6th week	4hr	Silicon rectifier applications: load surge protection and working idea. Using a silicon rectifier to control the lighting intensity of a lamp: the practical circuit, core equations, and wave diagrams.	Silicon rectifier	Theoretical lecture	oral examination and quiz
7th & 8th weeks	4hr	Oscillators: Definition of back feed and its types. Mathematical equations for the final enlargement of the system. Oscillation conditions for oscillators. Examples of oscillators (LC oscillator, Hartley oscillator, Colbits oscillator, and phase shift oscillator).	Oscillators	Theoretical lecture	oral examination and quiz
9th & 10th & 11th weeks	4hr	The transistor as a switch: its specifications, its operation on the load line, and its response to a rectangular input panel. Vibrators and their types (the monostable vibrator, bistable vibrator, and unstable vibrator). Mathematical relationships, shapes, and waves of oscillators.	Vibrators	Theoretical lecture	oral examination and quiz
12th & 13th weeks	4hr	Operational amplifier: its equivalent circuit and specifications (input resistance, output resistance, and amplification). Inverting and non-inverting amplifiers with magnification equations.	Operational amplifier	Theoretical lecture	oral examination and quiz
14th & 15th weeks	4hr	Inverting adder circuit and non-inverting adder circuit with output equations. solved examples	Operational amplifier applications	Theoretical lecture	oral examination and quiz
16th week	4hr	Subtractor circuit: equations and applied circuit with examples.	Operational amplifier applications	Theoretical lecture	oral examination and quiz
17th & 18th weeks	4hr	Integrator and Differentiator Circuit: Derivation of output equations with examples.	Operational amplifier applications	Theoretical lecture	oral examination and quiz
19th week	4hr	The comparor: its circle and the idea of work with examples.	Operational amplifier applications	Theoretical lecture	oral examination and quiz
20th week	4hr	Using op-amps in rectification circuits: ideal half-wave rectifier and ideal full-wave rectifier with examples.	Operational amplifier applications	Theoretical lecture	oral examination and quiz
21st week	4hr	Schmitt trigger: its circuit and the idea of the work. Drawing the characteristics of the conversion and the output voltage with examples.	Operational amplifier applications	Theoretical lecture	oral examination and quiz
22nd week	4hr	Square wave generator: its circuit, derivation of the equation for the output frequency. A design example.	Wave generators using the operational amplifier	Theoretical lecture	oral examination and quiz

23rd week	4hr	Pulse generator: its circuit, working idea, and derivation of the pulse width equation with an example.	Wave generators using the operational amplifier	Theoretical lecture	oral examination and quiz
24th week	4hr	Triangle wave generator: its circuit, working idea, and derivation of the frequency equation for the output wave with examples.	Wave generators using the operational amplifier	Theoretical lecture	oral examination and quiz
25th & 26th week	4hr	The analog calculator: its design with examples. Timer IC555: its construction and use in oscillators, with the derivation of pulse width calculation equations. Solved examples.	Analog calculator	Theoretical lecture	oral examination and quiz
27th week	4hr	Low-pass filter (LPF) and high-pass filter (HPF), their properties and response curve equations with examples.	Active RC filters	Theoretical lecture	oral examination and quiz
28th week	4hr	Band-pass filter (BPF) and band-stop filter (BSF); their properties, and response curve equations with examples.	Active RC filters	Theoretical lecture	oral examination and quiz
29th week	4hr	Basic methods for fabrication integrated circuits.	Integrated circuit fabrication	Theoretical lecture	oral examination and quiz
30th week	4hr	Fabrication of an integrated circuit for an NPN transistor, manufacturing integrated resistors and capacitors, and manufacturing an integrated circuit for a simple electronic	Integrated circuit fabrication	Theoretical lecture	oral examination and quiz

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	4hr	Zener regulator	DC voltage regulators	practical lecture	oral examination and writing report
2nd week	4hr	Parallel voltage regulator	DC voltage regulators	practical lecture	oral examination and writing report
3rd week	4hr	Series voltage regulator	DC voltage regulators	practical lecture	oral examination and writing report
4th week	4hr	Controlling the lighting intensity of a lamp using the thyristor	Thyristor	practical lecture	oral examination and writing report
5th week	4hr	The mono-stable vibrator	The vibrators	practical lecture	oral examination and writing report
6th week	4hr	The bi-stable vibrator	The vibrators	practical lecture	oral examination and writing report
7th week	4hr	The unstable vibrator	The vibrators	practical lecture	oral examination and writing report
8th week	4hr	Phase shift oscillator	The oscillators	practical lecture	oral examination and writing report
9th week	4hr	Hartley oscillator	The oscillators	practical lecture	oral examination and writing report
10th week	4hr	Colbits oscillator	The oscillators	practical lecture	oral examination and writing report
11th week	4hr	Inverting and non-inverting operational amplifiers	The operational amplifier	practical lecture	oral examination and writing report
12th week	4hr	The inverting adder	The operational amplifier	practical lecture	oral examination and writing report
13th week	4hr	The non-inverting adder	The operational amplifier	practical lecture	oral examination and writing report
14th week	4hr	The subtractor	The operational amplifier	practical lecture	oral examination and writing report

15th week	4hr	The differentiator	The operational amplifier	practical lecture	oral examination and writing report
16th week	4hr	The integrator	The operational amplifier	practical lecture	oral examination and writing report
17th week	4hr	The Comparator	The operational amplifier	practical lecture	oral examination and writing report
18th week	4hr	Schmitt trigger	The operational amplifier	practical lecture	oral examination and writing report
19th week	4hr	Ideal half-wave rectifier	The operational amplifier	practical lecture	oral examination and writing report
20th week	4hr	Ideal full-wave rectifier	The operational amplifier	practical lecture	oral examination and writing report
21st week	4hr	Sine wave generator using operational amplifier	The sine wave generator	practical lecture	oral examination and writing report
22nd week	4hr	Square wave generator using operational amplifier	The square wave generator	practical lecture	oral examination and writing report
23rd week	4hr	Triangle wave generator using an operational amplifier	The triangle wave generator	practical lecture	oral examination and writing report
24th week	4hr	Using the timer IC555 as a mono-stable oscillator	The timer IC555	practical lecture	oral examination and writing report
25th week	4hr	Using the timer IC555 as an unstable vibrator	The timer IC555	practical lecture	oral examination and writing report
26th week	4hr	Active LPF filter	Active filters	practical lecture	oral examination and writing report
27th week	4hr	Active HPF filter	Active filters	practical lecture	oral examination and writing report
28th week	4hr	Active BPF filter	Active filters	practical lecture	oral examination and writing report
29th week	4hr	Active BSF filter	Active filters	practical lecture	oral examination and writing report
30th week	4hr	Prepare a model of an integrated circuit and learn how to design it	The integrated Circuits	practical lecture	oral examination and writing report

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The methodical book (The electronic circuits)
Main references (sources)	The methodical book (The electronic circuits)
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the electronic circuits topics
Electronic References, Websites	https://stackexchange.com/

Course Description Form

1. Course Name:	
Engineering drawing	
2. Course Code:	
ED	
3. Semester / Year:	
(First year, First semester)	
4. Description Preparation Date:	
05/02/2024	
5. Available Attendance Forms:	
Practical lecture	
6. Number of Credit Hours (Total) / Number of Units (Total)	
45 hours/ 3 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Eman Jawad Email: eman.naji@atu.edu.iq	
8. Course Objectives	
Course Objectives	1- He knows the advantages of computer drawing. 2- Recognizes the system interface (AUTO CAD), its bars, drawing and adjustment menus. 3- Learns to use the AUTO CAD program for drawing electrical and electronic circuits.
9. Teaching and Learning Strategies	
Strategy	1.Explain the material to students in a way that the student learns how to draw using a computer 2.Students apply various drawings and strengthen their skills in dealing with the required drawing and modification instructions. 3.Assessment of students through paintings and exams

10. Course Structure

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	3hr	Advantages of computer drawing and the basic components of the AUTOCAD program		practical lecture	Daily exam and boards
2nd week	3hr	How to activate and run the AutoCAD Program interface hide tapes activate tapes and icons		practical lecture	Daily exam and boards
3rd week	3hr	Detailed explanation of the components of the draw bar, Modify, tools bar		practical lecture	Daily exam and boards
4th week	3hr	Identify the types of drawing lines in the program and how to download the types of lines		practical lecture	Daily exam and boards
5th week	3hr	How to draw line, circle, arc, in their different ways		practical lecture	Daily exam and boards
6th week	3hr	How to draw polygon, polyline, rectangle, multiline		practical lecture	Daily exam and boards
7th week	3hr	Adding dimensions and texts in the AutoCAD program		practical lecture	Daily exam and boards
8th week	3hr	Performing engineering operations, drawing a triangle in its three ways, drawing a straight line parallel to a known straight line, and drawing a circle passing the vertices of the Triangle		practical lecture	Daily exam and boards
9th week	3hr	Divide a straight line into several equal parts draw a pentagonal polygon with radius information		practical lecture	Daily exam and boards
10th week	3hr	Projectors how to draw projectors how to execute projectors		practical lecture	Daily exam and boards
11th week	3hr	Practical applications to projectors		practical lecture	Daily exam and boards
12th week	3hr	Practical applications to projectors		practical lecture	Daily exam and boards
13th week	3hr	Practical applications to projectors		practical lecture	Daily exam and boards
14th week	3hr	Practical applications to projectors		practical lecture	Daily exam and boards
15th week	3hr	How to draw and create three-dimensional drawings in AUTOCAD		practical lecture	Daily exam and boards

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:

a. Exam = 20 marks
b. Weekly drawing= 20 marks

2. **daily oral and preparation= 10 Marks**
3. **Final exam** =50 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering drawing
Main references (sources)	Descriptive geometry
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the Engineering and electrical drawing
Electronic References, Websites	All sites and video lectures that are interested in electrical drawing

Course Description Form

1. Course Name:	
Mathematics-1	
2. Course Code:	
R-1	
3. Semester / Year:	
First year, First semester	
4. Description Preparation Date:	
05/02/2024	
5. Available Attendance Forms:	
Theoretical lecture	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 2 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Eman Jawad Naji Email: eman.naji@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. The student understands the laws and mathematical issues 2. To solve simple and complex electrical circuits using mathematics 3. knows the applications of Engineering Mathematics
9. Teaching and Learning Strategies	
Strategy	1.Discuss the students and ask questions about the topic of the lecture and how to think critically and analytically, and then guide them towards how to solve the problem in a way that suits the topic. 2.Explain the material in a consistent manner commensurate with the initial inquiries and discussions of the topic, in addition to using the available means of explanation that help to consolidate the lesson through solved examples and exercises that provoke brainstorming students. 3.The use of feedback and assessment of the student's comprehension of the material.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Types of matrices, operations on matrices		Theoretical lecture	Solving exercises + daily exam
2nd week	2hr	Solving linear equations using determinants (Cramer's rule)		Theoretical lecture	Solving exercises + daily exam
3rd week	2hr	Vectors –vector analysis-scalar and Vector quantities – vector algebra –operations on vectors – phase angle		Theoretical lecture	Solving exercises + daily exam
4th week	2hr	Orthogonal vectors-scalar and directional multiplication-applications.		Theoretical lecture	Solving exercises + daily exam
5th week	2hr	Trigonometric function - trigonometric relations-logarithmic function		Theoretical lecture	Solving exercises + daily exam
6th week	2hr	Exponential functions Hyperbola functions and their applications		Theoretical lecture	Solving exercises + daily exam
7th week	2hr	Limits – limits of algebraic and trigonometric functions-applications		Theoretical lecture	Solving exercises + daily exam
8th week	2hr	Differential –derivation by definition – derivation of algebraic functions-chain rule		Theoretical lecture	Solving exercises + daily exam
9th week	2hr	Standard implicit function-higher-order derivative		Theoretical lecture	Solving exercises + daily exam
10th week	2hr	Derivation of trigonometric and logarithmic functions		Theoretical lecture	Solving exercises + daily exam
11th week	2hr	The derivative of exponential functions		Theoretical lecture	Solving exercises + daily exam
12th week	2hr	Applications of the derivation-the equation of tangent and column -, acceleration and velocity		Theoretical lecture	Solving exercises + daily exam
13th week	2hr	Increasing and decreasing-minor and great endings		Theoretical lecture	Solving exercises + daily exam
14th week	2hr	General physical and engineering applications		Theoretical lecture	Solving exercises + daily exam
15th week	2hr	Indefinite integration-integration of algebraic-trigonometric functions		Theoretical lecture	Solving exercises + daily exam

11. Course Evaluation
The Distribution of the score out of 100 is according to the following: **1. Theoretical:** a. First month = 20 marks b. Second month= 20 marks **2. daily oral and preparation= 10 Marks** **3. Final exam** a. Theoretical=50 marks

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Applied mathematics-yaequb sibagha
Main references (sources)	Solving electrical circuits-Joseph Methods for solving differential equations-Khaled Ahmed Samarai - Yahya Abdul said Calculus ((Thomas)) Laplace transformation
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the applied mathematics
Electronic References, Websites	All applied mathematics websites on the internet

Course Description Form

1. Course Name:	
Human rights	
2. Course Code:	
H R	
3. Semester / Year:	
First Year / First semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 1 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Zaid khudhur Email: zaid.bermany@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Know about human rights. **2.** In addition, the student will be able to deal with different Theories of human right
3. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include most of the questions that can be asked about the topic and will be answered during the lecture. Students will be taken through a discussion in order to find the pre answers to those questions.

4. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	1	Introduction		Theoretical lecture	oral examination and quiz
2nd week	1	Explain the term of human rights		Theoretical lecture	oral examination and quiz
3rd week	1	The historical of human rights		Theoretical lecture	oral examination and quiz
4th week	1	Development of human rights		Theoretical lecture	oral examination and quiz
5th week	1	Development of human rights		Theoretical lecture	oral examination and quiz
6th week	1	Development of human rights		Theoretical lecture	oral examination and quiz
7th week	1	Human rights and Sumerian civilization		Theoretical lecture	oral examination and quiz
8th week	1	Human rights in Roman civilization		Theoretical lecture	oral examination and quiz
9th week	1	Human rights in the Nile Valley civilization		Theoretical lecture	oral examination and quiz
10th week	1	Introduction to heavenly religions.		Theoretical lecture	oral examination and quiz
11th week	1	Human rights in Judaism		Theoretical lecture	oral examination and quiz
12th week	1	Human rights in the Christian religion		Theoretical lecture	oral examination and quiz
13th week	1	Human rights in the Islamic religion		Theoretical lecture	oral examination and quiz
14th week	1	Human rights in the Islamic religion		Theoretical lecture	oral examination and quiz
15th week	1	Comparison between other religions and Islam.		Theoretical lecture	oral examination and quiz
15th week	1	Democracy and Islam		Theoretical lecture	oral examination

5. Course Evaluation

First semester 20% -- second semester 20% -- activities 10% -- final exam 50%

1. Learning and Teaching Resources

Required textbooks (curricular books, if a	Human Rights book
Main references (sources)	The organization of human rights magazine
Recommended books and references (scientific journals, reports…)	

Course Description Form

1. Course Name:	
Direct Current Circuits	
2. Course Code:	
DCC	
3. Semester / Year:	
First year /First semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours/ 6 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Hawraa Neama Jasim Email: hawraa.jasim.iba9@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Defines the general meaning of direct current circuits 2. Appreciates the importance of direct current circuits in scientific progress 3. Distinguish between direct current circuits **4**. It can design different DC circuits
9.Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include most of the questions that can be asked about the topic and will be answered during the lecture. Students will be taken through a discussion in order to find the pre answers to those questions. This is followed by a detailed explanation of the topic by which many examples and solutions are given. Moreover, the lecture includes different educational videos which would virtually clarify the topic. At the end of the lecture, and to ensure that all students have understood the basics of the topic, students are discussed by various questions. On the other hand, during the practical lecture, the students are given the lecture as mentioned above, in addition to the practical application, which includes connecting the logic circuits and recording the data obtained from the circuit in order to be compared with the theoretical results, and then writing a detailed report on the experiment and its results.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Units used in electricity and measuring units for each elements- math applications for units transforming, units for voltage, current and resistor, electrical circuit components, Ohm's law.	Units	Theoretical lecture	oral examination and quiz
2nd week	2hr	factor effecting on resistor value, resistivity for conductor and insulators, temperature effect on resistor value, temperature factor of resistor	factor effecting on resistance	Theoretical lecture	oral examination and quiz
3rd week	2hr	DC current circuits: Series resistors circuits with example, Parallel resistors circuits with example, Series and Parallel resistors circuits.	DC current circuits	Theoretical lecture	oral examination and quiz
4th week	2hr	Star – delta transformation with example	Star – delta transformation	Theoretical lecture	oral examination and quiz
5th week	2hr	Kirchhoff's circuit laws for current and voltage with examples.	Kirchhoff's circuit laws	Theoretical lecture	oral examination and quiz
6th week	2hr	Methods of Analysis: 1-Nodal Analysis with example,	Methods of Analysis	Theoretical lecture	oral examination and quiz
7th week	2hr	Methods of Analysis: 2-Mesh Analysis with example.	Methods of Analysis	Theoretical lecture	oral examination and quiz
8th week	2hr	Thévenin theorem, definition, application on DC circuit.	Thévenin theorem	Theoretical lecture	oral examination and quiz
9th week	2hr	Norton theorem, definition, application on DC circuit.	Norton theorem	Theoretical lecture	oral examination and quiz
10th week	2hr	Examples on Thevenin and Norton theories.	Thearms	Theoretical lecture	oral examination and quiz
11th week	2hr	Super position theory, definition, applying it on DC circuit with one voltage source,	Super position theory	Theoretical lecture	oral examination and quiz
12th week	2hr	solving example on current and voltage source transformation, maximum power transformation,	source transformation	Theoretical lecture	oral examination and quiz
13th week	2hr	AC circuit with resistor only, AC circuit with pure inductor, AC circuit with pure capacitor.	AC circuit	Theoretical lecture	oral examination and quiz
14th week	2hr	AC circuit with (resistor and inductor on series, resistor and capacitor on series, resistor, capacitor and inductor on series), with examples.	AC circuit	Theoretical lecture	oral examination and quiz
15th week	2hr	AC circuit with (resistor and inductor, resistor and capacitor, resistor capacitor and inductor) on parallel, with examples.	AC circuit	Theoretical lecture	oral examination and quiz

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Laboratory environment introduction, laboratory reports guiding, device using methods.	Introduction	practical lecture	oral examination and writing report
2nd week	2hr	Color Resister measurements, resistor measuring using ohmmeter, error percentage calculation.	Resister measurements	practical lecture	oral examination and writing report
3rd week	2hr	DC and AC voltmeter measurements, DC and AC measurements using ova meter, DC power supply.	Measurements Devices	practical lecture	oral examination and writing report
4th week	2hr	Measuring of electricity motive force (e.m.f.), inner resistor of battery, resistor temperature coefficient.	Measurements Devices	practical lecture	oral examination and writing report

5th week	2hr	Resistivity for common conductors, Ohm's law practical applications.	Ohm's law	practical lecture	oral examination and writing report
6th week	2hr	Resistor connection (series, parallel, series and parallel), examples.	Resistor connection	practical lecture	oral examination and writing report
7th week	2hr	Equivalent circuits in delta-star DC circuits, examples.	delta-star	practical lecture	oral examination and writing report
8th week	2hr	First and second Kirchhoff's law.	Kirchhoff's law	practical lecture	oral examination and writing report
9th week	2hr	Applying Thévenin theorem	Thévenin theorem	practical lecture	oral examination and writing report
10th week	2hr	Applying Norton theorem	Norton theorem	practical lecture	oral examination and writing report
11th week	2hr	Power distribution, maximum power transformation in DCcircuits, examples.	Power	practical lecture	oral examination and writing report
12th week	2hr	Oscilloscope device, comparison between maximum value and middle value, peak and components coefficient calculation, examples.	Oscilloscope device	practical lecture	oral examination and writing report
13th week	2hr	Parallel and series connection (RC - RL)	connection	practical lecture	oral examination and writing report
14th week	2hr	Phase angle measuring in series (RLC), examples	Phase angle measuring	practical lecture	oral examination and writing report
15th week	2hr	Phase angle measuring in parallel (RLC), examples.	Phase angle measuring	practical lecture	oral examination and writing report

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
   a. First month = 10 marks
   b. Second month= 10 marks
2. **Practical:**
   a. Fiest month= 10 marks
   b. Second month= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
   a. Theoretical=40 marks B. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of electrical engineering science
Main references (sources)	1.Basic Electrical Engineering (Fitzgerald& Rlgginbothan). 2. Electrical Technology (Edward Hughes). 3. Introduction To Electric Circuit (M.Romanwltz) John Willey
Recommended books and references (scientific journals, reports…)	All books and magazines that care about circuits direct current alternative current, electrical foundations
Electronic References, Websites	All locations and video lectures of direct current and alternating cu circles

Course Description Form

1. Course Name:	
Principles of Electronics	
2. Course Code:	
PoE	
3. Semester / Year:	
First year / First semester	
4. Description Preparation Date:	
06/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: AbdulHussein AbdulZahra Abd Email: abdul.abd@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course, 1- The student should be able to know: a- Electronic components manufactured from semiconductors of various types - composition - properties - uses in electronic circuits - Its applications and analysis of its electronic circuits. b- an idea about optoelectronics and its components. c- an idea about integrated circuits and simplified applications of the operational amplifier. 2- The student should be able to: a-Use the basic electronic devices in the laboratory. b- Connecting electronic elements in simple electronic circuits. c-Know the specifications and features of electronic parts. d-Identify the applied circuits for some components and implement them.
9. Teaching and Learning Strategies	
Strategy	1- Discussing with the students and asking questions about the lecture topic and how to think critically and analytically, and then directing them towards how to solve the problem in a way that suits the topic. 2- Explaining the material in a consistent way that is appropriate for the initial inquiries and discussions of the subject, in addition to using the available means of clarification that help consolidate the lesson, such as using video scenes on websites and realistic examples, in addition to addressing many solved examples. 3. Use feedback and evaluate the student's understanding of the material.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Semiconductor theory - atomic structure - energy levels - crystals - conduction in crystals - holes current - how holes move.	Semiconductor theory	Theoretical lecture	oral examination and quiz
2nd week	2hr	doping - positive type (P) semiconductor - negative type (N) semiconductor- current of electrons and current of holes bulk resistance.	doping	Theoretical lecture	oral examination and quiz
3rd week	2hr	Semiconductor diodes - PN junction -formation of the depletion region - barrier voltage - thermal effects - - minority carrier current - permissive leakage current - breaking voltage - maximum forward current - maximum reverse current.	Semiconductor diodes	Theoretical lecture	oral examination and quiz
4th week	2hr	Biased diode - forward bias - reverse bias – characteristic curves in the forward and reverse directions -. The equivalent circuit of a diode.	Diode bias	Theoretical lecture	oral examination and quiz
5th week	2hr	The diode as a current rectifier - a half-wave rectifier - the calculation of dc value of the current - the r.m.s value of current - the output frequency.	Half-wave rectification	Theoretical lecture	oral examination and quiz
6th week	2hr	Full-wave rectification - using a center-tapped transformer - bridge rectifier - calculating average and effective values of voltages and currents - output frequency - comparison between half-wave and full-wave rectification - comparison between full-wave rectifiers.	Full-wave rectification	Theoretical lecture	oral examination and quiz
7th week	2hr	Filters – filtering using capacitor - RC and LC filters - output voltages - ripple - voltage doubler - clipping circuits - positive clipping - negative clipping - combination clipping - peak-to-peak detector - positive and negative clamps.	filters	Theoretical lecture	oral examination and quiz
8th week	2hr	Zener diode - composition - symbol - forward and reverse characteristics - breakdown and breakage voltages - zener impedance - temperature effects.	Zener diode	Theoretical lecture	oral examination and quiz
9th week	2hr	Zener approximations - constant voltage regulation - constant voltage source circuit - variable capacitance diode and its applications.	Zener approximations	Theoretical lecture	oral examination and quiz
10th week	2hr	Bipolar transistor - structure - symbol - characteristics - regions - definition of (βdc) and definition of (αdc), the relationship between them - definition of important regions on the characteristic's curves.	Bipolar transistor	Theoretical lecture	oral examination and quiz
11th week	2hr	Transistor bias circuits - base bias - emitter bias - collector bias - approximation in the transistor and the equivalent circuit.	Transistor bias	Theoretical lecture	oral examination and quiz
12th week	2hr	Transistor characteristics curves – operation regions - definition of Iceo and Icbo -current gain curve - relationship between Icbo and Ic	Transistor characteristics curves	Theoretical lecture	oral examination and quiz
13th week	2hr	Transistor bias circuits - base bias - emitter bias	Transistor bias circuits	Theoretical lecture	oral examination and quiz
14th week	2hr	Collector bias - self-bias - feed-back bias - voltage divider bias - applied examples.	Transistor bias circuits	Theoretical lecture	oral examination and quiz
15th week	2hr	The DC equivalent circuit of the transistor - the DC load line -.	DC equivalent circuit of a transistor	Theoretical lecture	oral examination and quiz

Week	Hours	Practical	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Introduction to the use of equipment used in the laboratory	Identify the equipment in the laboratory	practical lecture	oral examination and writing report
2nd week	2hr	characteristics of diodes in forward bias and drawing of the characteristics curve -	Forward bias of the diode	practical lecture	oral examination and writing report
3rd week	2hr	characteristics of diodes in reverse bias and drawing of the characteristics curve -	Reverse bias of the diode	practical lecture	oral examination and writing report
4th week	2hr	Half-wave rectifier.	Half-wave rectifier.	practical lecture	oral examination and writing report
5th week	2hr	full wave bridge rectifier	full wave bridge rectifier	practical lecture	oral examination and writing report
6th week	2hr	Full wave rectifier using a center tapped transformer	Full wave rectifier using a center tapped transformer	practical lecture	oral examination and writing report
7th week	2hr	Half-wave rectifier with RC filter and LC filter	Half-wave rectifier with RC filter and LC filter	practical lecture	oral examination and writing report
8th week	2hr	Full wave rectifier with RC filter and LC filter.	Full wave rectifier with RC filter and LC filter	practical lecture	oral examination and writing report
9th week	2hr	clipping circuits (positive, negative, and compound)	clipping circuits	practical lecture	oral examination and writing report
10th week	2hr	Constant voltage doubled circuits (for three or four times)	Constant voltage doubled circuits	practical lecture	oral examination and writing report
11th week	2hr	Zener diode - forward and reverse characteristics.	characteristics of the Zener diode	practical lecture	oral examination and writing report
12th week	2hr	The use of a Zener diode in regulating constant voltage with a fixed resistive load - The use of a Zener diode in regulating voltage with a variable resistive load	Voltage regulation using a Zener diode	practical lecture	oral examination and writing report
13th week	2hr	Characteristics of the common-base transistor.	Characteristics of the common-base transistor.	practical lecture	oral examination and writing report
14th week	2hr	Characteristics of the common-emitter transistor.	Characteristics of the common-emitter transistor.	practical lecture	oral examination and writing report
15th week	2hr	Common base amplifier (finding voltage gain and current gain)	Common base amplifier	practical lecture	oral examination and writing report

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
   a. First month = 10 marks
   b. Second month= 10 marks
2. **Practical:**
   a. Fiest month= 10 marks
   b. Second month= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
   a. Theoretical=40 marks
   b. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular, books, if any)	1- Electronic and audio circuits (written by: Dhia Mahdi and others), Dar Al-Tak Authority of Technical Institutes - Dar Al-Hekma 1990. 2- Electronic Circuits (Written by: Dhia Mahdi and others) Authority of Technical Instit 1990. 3- Power Electronics (Written by: Dhia Mahdi and others) Dar Al-Hekma 1990. 4- Industrial Electronics (Written by: Dhia Mahdi and others) Authority of Techn Institutes - Dar Al-Hekma 1985. 5- An Introduction to semiconductors By: (K.I.Gross).
Main references (sources)	Principles of Electronics - Malvino
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the electronic circuits topics.
Electronic References, Websites	All websites and video lectures related to electronic principles.

Course Description Form

1. Course Name:	
Principles Of Computer	
2. Course Code:	
POC	
3. Semester / Year:	
First year / First semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Hawraa Neama Jasim Email: hawraa.jasim.iba9@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: Teaching the student to be familiar with the basic rules of dealing with the computer and its management to help him in the completion of projects, Printing, statistics and graphic preparation, presentation creation and engineering chart designs And, the advent of the Internet as a means of communication accessible to all has become very necessary that the student learns to use the role of the Internet in many fields, including education, scientific research, trade and marketing by electronic correspondence, web pages and electronic speaking.
9. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include most of the questions that can be asked about the topic and will be answered during the lecture. Students will be taken through a discussion in order to find the pre answers to those questions. This is followed by a detailed explanation of the topic by which many examples and solutions are given. Moreover, the lecture includes different educational videos which would virtually clarify the topic. At the end of the lecture, and to ensure that all students have understood the basics of the topic, students are discussed by various questions. On the other hand, during the practical lecture, the students are given the lecture as mentioned above, in addition to the practical application, which includes connecting the logic circuits and recording the data obtained from the circuit in order to be compared with the theoretical results, and then writing a detailed report on the experiment and its results.

10. Course Structure

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Run the WordPress 2010 file tab, program interfaces, and bars	introduction	practical lecture	oral examination and writing report
2nd week	2hr	Home tab, Clipboard group, Font, and paragraphs, Style set,	Home tab	practical lecture	oral examination and writing report
3rd week	2hr	Tab Editors group, and Page Layout	Editors tab	practical lecture	oral examination and writing report
4th week	2hr	The Themes, Page Setup, and Page Background group	Editors tab	practical lecture	oral examination and writing report
5th week	2hr	Paragraph group, arrangement group, View tab, document views	View tab	practical lecture	oral examination and writing report
6th week	2hr	Show group, Zoom group, window, Help	View tab	practical lecture	oral examination and writing report
7th week	2hr	Insert tab and Page set, The set of tables,	Insert tab	practical lecture	oral examination and writing report
8th week	2hr	Table Tools and Table Design tab	Design tab	practical lecture	oral examination and writing report
9th week	2hr	Illustrations, a link group, a header and footer group, an add equations group, and symbols group	Design tab	practical lecture	oral examination and writing report
10th week	2hr	Page layout tab, watermark and page borders	Page layout tab	practical lecture	oral examination and writing report
11th week	2hr	Add-ins for Microsoft Word, Reference tab, tables of contents, and footnote set	Reference tab	practical lecture	oral examination and writing report
12th week	2hr	Reference group, citations, captions, and index group	Reference tab	practical lecture	oral examination and writing report
13th week	2hr	Source table group, mailers tab, and create group, mail merge	mailers tab	practical lecture	oral examination and writing report
14th week	2hr	The Type and Insert fields group and the Results Preview group	mailers tab	practical lecture	oral examination and writing report
15th week	2hr	Review tab: Proofing, Language, Comments Group, changes, Comparison and Protection	Review tab	practical lecture	oral examination and writing report

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
   a. First month = 10 marks
   b. Second month= 10 marks
2. **Practical:**
   a. Fiest month= 10 marks
   b. Second month= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
   a. Theoretical=40 marks
   b. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Computer Fundamentals and Desktop Applications Part II/Microsoft office 2010
Main references (sources)	Beginning Microsoft Word 2010, by T.y Anderson, Guy Hart-Davis
Recommended books and references (scientific journals, reports...)	All books and magazines concerned with computer principles and applications
Electronic References, Websites	All websites and video lectures related to computer principles and applications

Course Description Form

1. Course Name:	
Principles of logic circuits	
2. Course Code:	
PLC	
3. Semester / Year:	
First semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Thoalfukar Husseini Email: thoalfukar@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Know about logic circuits and their importance in scientific progress, in addition their connection to other sciences. 2. Student will also be able to design different logic circuits and distinguish between the logic gates. 3. In addition, the student will be able to deal with different logic equations in terms of their application simplification. 4. Moreover, the student will be able to perform conversion operations between different digital systems.
9. **Teaching and Learning Strategies**	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include most of the questions that can be asked about the topic and will be answered during the lecture. Students will be taken through a discussion in order to find the pre answers to those questions. This is followed by a detailed explanation of the topic by which many examples and solutions are given. Moreover, the lecture includes different educational videos which would virtually clarify the topic. At the end of the lecture, and to ensure that all students have understood the basics of the topic, students are discussed by various questions. On the other hand, during the practical lecture, the students are given the lecture as mentioned above, in addition to the practical application, which includes connecting the logic circuits and recording the data obtained from the circuit in order to be compared with the theoretical results, and then writing a detailed report on the experiment and its results.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	A general idea of numerical systems (types and details)		Theoretical lecture	oral examination and quiz
2nd week	2hr	Transfers between the numerical systems		Theoretical lecture	oral examination and quiz
3rd week	2hr	Logic gates (types, working principle, truth tables, logical symbol)		Theoretical lecture	oral examination and quiz
4th week	2hr	How to connect the logic gates to form logic circuits.		Theoretical lecture	oral examination and quiz
5th week	2hr	Boolean algebra and the rule of de-Morgan		Theoretical lecture	oral examination and quiz
6th week	2hr	Simplification of logical equations using Boolean algebra and the laws of De Morgan's laws.		Theoretical lecture	oral examination and quiz
7th week	2hr	The design of the logical gates using NOR and NAND circuits,		Theoretical lecture	oral examination and quiz
8th week	2hr	Ways of writing the equation from truth table (POS, SOP).		Theoretical lecture	oral examination and quiz
9th week	2hr			Theoretical lecture	oral examination and quiz
10th week	2hr	Karnaugh Map (for two variables, the three variables, the four variables)		Theoretical lecture	oral examination and quiz
11th week	2hr	Simplification of logical equations using Karnaugh Map		Theoretical lecture	oral examination and quiz
12th week	2hr	Calculations in the binary system (addition, subtraction, subtraction using complements).		Theoretical lecture	oral examination and quiz
13th week	2hr			Theoretical lecture	oral examination and quiz
14th week	2hr	Logic circuit applications (half adder, full adder, parallel adder circuits)		Theoretical lecture	oral examination and quiz
15th week	2hr	Binary subtractor circuits (half subtractor, full subtractor parallel subtractor) circuit using the adder circuit by method of 1s complements.		Theoretical lecture	oral examination and quiz

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Deriving the truth table of NOT-AND-OR Gates using Switches		practical lecture	oral examination and writing report
2nd week	2hr	Deriving the truth table of NOT-AND-OR Gates using diodes and transistors		practical lecture	oral examination and writing report
3rd week	2hr	NOR-and NANAD Gates using diodes and transistors		practical lecture	oral examination and writing report
4th week	2hr	EX-OR and EX-NOR Gates		practical lecture	oral examination and writing report
5th week	2hr	DE Morgan's first and second law		practical lecture	oral examination and writing report
6th week	2hr	Deriving the basic gates from NAND gate using circuit of NAND gate		practical lecture	oral examination and writing report
7th week	2hr	Deriving the basic gates from NOR gate using circuit of NOR gate		practical lecture	oral examination and writing report
8th week	2hr	Deriving the EX-OR gate from NAND gate and NOR gate		practical lecture	oral examination and writing report

9th week	2hr	Comparator circuit with one rank		practical lecture	oral examination and writing report
10th week	2hr	Comparator circuit with two rank		practical lecture	oral examination and writing report
11th week	2hr	Comparator circuit with four numbers using IC 7485		practical lecture	oral examination and writing report
12th week	2hr	Conversion circuit from Binary to Decimal number		practical lecture	oral examination and writing report
13th week	2hr	Conversion circuit from Decimal to Binary number		practical lecture	oral examination and writing report
14th week	2hr	Half adder circuit using different gates and NAND gate		practical lecture	oral examination and writing report
15th week	2hr	Deriving the truth table of NOT-AND-OR Gates using Switches		practical lecture	oral examination and writing report

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:

5. **Theoretical:**
   a. First month = 10 marks
   b. Second month= 10 marks
6. **Practical:**
   a. Fiest month= 10 marks
   b. Second month= 10 marks
7. **daily oral and preparation= 10 Marks**
8. **Final exam**
   a. Theoretical=40 marks
   b. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Digital electronics and its applications - Malvino
Main references (sources)	Digital electronics and its applications - Malvino
Recommended books and references (scientific journals, reports…)	All books and Journals which includes the logic circuits top
Electronic References, Websites	https://stackexchange.com/

Course Description Form

1. Course Name:	
Electronics	
2. Course Code:	
Elc	
3. Semester / Year:	
first year / Second semester	
4. Description Preparation Date:	
06/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 hours/ 4 unit	
7. Course administrator's name	
Name: Abdulhussein Abdulzehra Abd Email: abdul.abd@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course, 1- The student should be able to know: d- Electronic components manufactured from semiconductors of various types - composition - properties - uses in electronic circuits - Its applications and analysis of its electronic circuits. e- an idea about optoelectronics and its components. f- an idea about integrated circuits and simplified applications of the operational amplifier. 2- The student should be able to: a-Use the basic electronic devices in the laboratory. c- Connecting electronic elements in simple electronic circuits. c-Know the specifications and features of electronic parts. d-Identify the applied circuits for some components and implement them.

9. Teaching and Learning Strategies	
Strategy	1- Discussing with the students and asking questions about the lecture topic and how to think critically and analytically, and then directing them towards how to solve the problem in a way that suits the topic. 2- Explaining the material in a consistent way that is appropriate for the initial inquiries and discussions of the subject, in addition to using the available means of clarification that help consolidate the lesson, such as using video scenes on websites and realistic examples, in addition to addressing many solved examples. 3. Use feedback and evaluate the student's understanding of the material.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	operating points - quiescent point - applied examples	operating points.	Theoretical lecture	oral examination and quiz
2nd week	2hr	Using the transistor to amplify small signals - the equivalent alternating circuit - current gain - voltage gain - power gain.	Using a transistor to amplify small signals	Theoretical lecture	oral examination and quiz
3rd week	2hr	-Ideal Approximation-Hybrid Parameters-Equivalent circuit using h-parameters.	Hybrid parameters	Theoretical lecture	oral examination and quiz
4th week	2hr	Voltage gain - current gain - power gain - input and output resistors - small signal amplifiers - base market - emitter market.	small signal amplifiers	Theoretical lecture	oral examination and quiz
5th week	2hr	The use of a transistor in voltage regulation - a series regulator - a parallel regulator - a constant voltage source circuit.	The use of a transistor in voltage regulation	Theoretical lecture	oral examination and quiz
6th week	2hr	Field effect transistor - structure – characteristic of MOSFET -	Field effect transistor	Theoretical lecture	oral examination and quiz
7th week	2hr	MOSFET - characteristics curves - Narrow voltage curves Vgs, Idss, Vp - Comparison between BJT, JFET - Working theory	Field effect transistor	Theoretical lecture	oral examination and quiz
8th week	2hr	FET bias circuits - constant current source bias – operating point - self-bias - FET equivalent circuit -	FET bias circuits	Theoretical lecture	oral examination and quiz
9th week	2hr	Using FET in small signal amplification.	Using FET in small signal amplification	Theoretical lecture	oral examination and quiz
10th week	2hr	Comparison between the types of FET transistors (JFET - MOSFET) and transistor (BJT).	Comparison between FET and BJT types	Theoretical lecture	oral examination and quiz
11th week	2hr	Light-dependent resistor - light-emitting diode - photodiode - phototransistor - seven- segment display - its structure and applications.	optoelectronics and its components	Theoretical lecture	oral examination and quiz

12th week	2hr	Silicon rectifiers with current control (thyristors) - construction and types - characteristics - working theory	thyristors	Theoretical lecture	oral examination and quiz
13th week	2hr	Triac - Diac - their symbol - characteristics - theory of operation - comparison between thyristors, Diac and Triac - protection of thyristors from (voltage change, current change).	thyristors	Theoretical lecture	oral examination and quiz
14th week	2hr	Integrated circuits - its meaning - its advantages and disadvantages - a comparison between it and discrete components - an idea about its manufacture - operational amplifier 741 - its symbol - its terminals - its uses - applications of operational amplifiers - small signal amplification - summing signals - subtracting signals - examples.	Integrated circuits	Theoretical lecture	oral examination and quiz
15th week	2hr	Operational amplifier applications: differentiator, comparator, integrator, … etc	Operational amplifier applications	Theoretical lecture	oral examination and quiz

Week	Hours	Practical	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Common emitter amplifier (voltage gain and current gain) and plot the frequency response curve.	Common emitter amplifier	practical lecture	oral examination and writing report
2nd week	2hr	Common collector amplifier (finding voltage gain and current gain).	Common collector amplifier	practical lecture	oral examination and writing report
3rd week	2hr	Common source amplifier - common drain amplifier	Common source amplifier - common drain amplifier	practical lecture	oral examination and writing report
4th week	2hr	Measurement of hybrid parameters - for the common base configuration.	Measurement of hybrid parameters	practical lecture	oral examination and writing report
5th week	2hr	The use of transistors in voltage regulation circuits - series regulator.	Series voltage regulator	practical lecture	oral examination and writing report
6th week	2hr	characteristics of field effect transistor FET.	characteristics of field effect transistor FET	practical lecture	oral examination and writing report
7th week	2hr	Common source amplifier.	Common source amplifier.	practical lecture	oral examination and writing report
8th week	2hr	Common drain amplifier.	Common drain amplifier	practical lecture	oral examination and writing report
9th week	2hr	Photodiode characteristics.	Photodiode characteristics.	practical lecture	oral examination and writing report
10th week	2hr	Characteristics of phototransistor.	Characteristics of phototransistor	practical lecture	oral examination and writing report
11th week	2hr	Characteristics of thyristor SCR	Characteristics of thyristor SCR	practical lecture	oral examination and writing report
12th week	2hr	Use of thyristors - their properties - phase angle control	Phase angle control using thyristors	practical lecture	oral examination and writing report

13th week	2hr	An applied circuit for using thyristors to control lamp illumination.	Controlling the illumination of a lamp using a thyristor	practical lecture	oral examination and writing report
14th week	2hr	Amplifier circuit using integrated circuit.	Amplifier circuit using integrated circuit	practical lecture	oral examination and writing report
15th week	2hr	Use an op -amp to summing two signals and amplify the potential difference between the two signals.	Use an op amp to add and subtract two signals	practical lecture	oral examination and writing report

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
   a. First month = 10 marks
   b. Second month= 10 marks
2. **Practical:**
   a. Fiest month= 10 marks
   b. Second month= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
   a. Theoretical=40 marks
   b. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular, books, if any)	1- Electronic and audio circuits (written by: Dhia Mahdi and others), Dar Al-Tak Authority of Technical Institutes - Dar Al-Hekma 1990. 2- Electronic Circuits (Written by: Dhia Mahdi and others) Authority of Technical Instit 1990. 3- Power Electronics (Written by: Dhia Mahdi and others) Dar Al-Hekma 1990. 4- Industrial Electronics (Written by: Dhia Mahdi and others) Authority of Techn Institutes - Dar Al-Hekma 1985. 5- An Introduction to semiconductors By: (K.I.Gross).
Main references (sources)	Principles of Electronics - Malvino
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the electronic circuits topics.
Electronic References, Websites	All websites and video lectures related to electronic principles.

Course Description Form

1. Course Name:	
logic circuits	
2. Course Code:	
LC	
3. Semester / Year:	
Second semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Thoalfukar Husseini Email: thoalfukar@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Know about logic circuits and their importance in scientific progress, in addition their connection to other sciences. 2. Student will also be able to design different logic circuits and distinguish between the logic gates. 3. In addition, the student will be able to deal with different logic equations in terms of their application simplification. 4. Moreover, the student will be able to perform conversion operations between different digital systems.
9. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include most of the questions that can be asked about the topic and will be answered during the lecture. Students will be taken through a discussion in order to find the pre answers to those questions. This is followed by a detailed explanation of the topic by which many examples and solutions are given. Moreover, the lecture includes different educational videos which would virtually clarify the topic. At the end of the lecture, and to ensure that all students have understood the basics of the topic, students are discussed by various questions. On the other hand, during the practical lecture, the students are given the lecture as mentioned above, in addition to the practical application, which includes connecting the logic circuits and recording the data obtained from the circuit in order to be compared with the theoretical results, and then writing a detailed report on the experiment and its results.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	The circuit of encoder size of 4:2, 8:3 and 10:4		Theoretical lecture	oral examination and quiz
2nd week	2hr	Introduction to sequential logic circuits, a general idea of the Flip Flop, flip flop type (S-R).		Theoretical lecture	oral examination and quiz
3rd week	2hr	The flip flop type J-K and master slave flip flop		Theoretical lecture	oral examination and quiz
4th week	2hr	The D- flip flop and T flip flop		Theoretical lecture	oral examination and quiz
5th week	2hr	The registers, design of registers, enter the information and output from registers		Theoretical lecture	oral examination and quiz
6th week	2hr	The shift register, shift to left, shift to right		Theoretical lecture	oral examination and quiz
7th week	2hr	The counter- asynchronous counter		Theoretical lecture	oral examination and quiz
8th week	2hr	The synchronous counter- the cycle counter		Theoretical lecture	oral examination and quiz
9th week	2hr	The multiplexer and its applications		Theoretical lecture	oral examination and quiz
10th week	2hr	The code convertor – the application of code convertor		Theoretical lecture	oral examination and quiz
11th week	2hr	Programmable logic array: Concepts of programmable logic array (PLA); Concepts of programmable array logic (PAL)		Theoretical lecture	oral examination and quiz
12th week	2hr			Theoretical lecture	oral examination and quiz
13th week	2hr	Buffers, Non inverting buffers, inverting buffers, Tri-state buffers, transmission gates		Theoretical lecture	oral examination and quiz
14th week	2hr	Introduction to Sequential logic latches and flip flops, Latches-Edge triggered flip flop, Flip-flop operating characteristics, Flip-flop applications		Theoretical lecture	oral examination and quiz
15th week	2hr	Introduction To State Machine Design,		Theoretical lecture	oral examination and quiz

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Half Subtractor circuit using different gates and NAND gate		practical lecture	oral examination and writing report
2nd week	2hr	Full adder circuit		practical lecture	oral examination and writing report
3rd week	2hr	Full subtractor circuit		practical lecture	oral examination and writing report
4th week	2hr	Using IC to add two binary numbers with four bit and to subtract two binary numbers with four bit		practical lecture	oral examination and writing report
5th week	2hr	R-S Filp Flop using NAND and NOR Gates		practical lecture	oral examination and writing report
6th week	2hr	R-S-T flip flop		practical lecture	oral examination and writing report
7th week	2hr	D-type flip flop using R-S		practical lecture	oral examination and writing report

8th week	2hr	T-type flip flop using R-S		practical lecture	oral examination and writing report
9th week	2hr	JK flip flop from RS flip flop		practical lecture	oral examination and writing report
10th week	2hr	Master-slave flip flop		practical lecture	oral examination and writing report
11th week	2hr	D and T flip flop from Master – slave		practical lecture	oral examination and writing report
12th week	2hr	Generation of square waves using R-S flip flop		practical lecture	oral examination and writing report
13th week	2hr	Ascending Wavy Counter		practical lecture	oral examination and writing report
14th week	2hr	Descending Wavy Counter		practical lecture	oral examination and writing report
15th week	2hr	Half Subtractor circuit using different gates and NAND gate		practical lecture	oral examination and writing report

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:

1. **Theoretical:**
   a. First month = 10 marks
   b. Second month= 10 marks
2. **Practical:**
   a. Fiest month= 10 marks
   b. Second month= 10 marks
3. **daily oral and preparation= 10 Marks**
4. **Final exam**
   a. Theoretical=40 marks
   b. Practical =10 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Digital electronics and its applications - Malvino
Main references (sources)	Digital electronics and its applications - Malvino
Recommended books and references (scientific journals, reports…)	All books and Journals which includes the logic circ topics
Electronic References, Websites	https://stackexchange.com/

Course Description Form

1. Course Name:	
Democracy	
2. Course Code:	
H R	
3. Semester / Year:	
First Year / Second Semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 1 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Zaid khudhur Email: zaid.bermany@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. Know about human rights. 2. In addition, the student will be able to deal with different Theories of human right
9. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include most of the questions that can be asked about the topic and will be answered during the lecture. Students will be taken through a discussion in order to find the pre answers to those questions.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2	Democracy		Theoretical lecture	oral examination and quiz
2nd week	2	History of democracy		Theoretical lecture	oral examination and quiz
3rd week	2	Democracy in Roman civilization		Theoretical lecture	oral examination and quiz
4th week	2	The development of democracy		Theoretical lecture	oral examination and quiz
5th week	2	The development of democracy		Theoretical lecture	oral examination and quiz
6th week	2	Types of democracies		Theoretical lecture	oral examination and quiz
7th week	2	Types of democracies		Theoretical lecture	oral examination and quiz
8th week	2	The difference between democracy and dictatorship		Theoretical lecture	oral examination and quiz
9th week	2	Types of political rule		Theoretical lecture	oral examination and quiz
10th week	2	Types of political rule		Theoretical lecture	oral examination and quiz
11th week	2	The benefit of democracy for public life		Theoretical lecture	oral examination and quiz
12th week	2	The benefit of democracy for public life		Theoretical lecture	oral examination and quiz
13th week	2	Arab democracies		Theoretical lecture	oral examination and quiz
14th week	2	Arab democracies		Theoretical lecture	oral examination and quiz
15th week	2	Democracy and Islam		Theoretical lecture	oral examination and quiz

11. Course Evaluation

First semester 20% second semester 20%, activities 10% final exam 50%

1. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Human Rights book
Main references (sources)	The organization of human rights magazine
Recommended books and references (scientific journals, reports...)	

Course Description Form

1. Course Name:	
Electrical drawing	
2. Course Code:	
ED	
3. Semester / **Year**:	
First Year /Second semester	
4. Description **Preparation** Date:	
05/02/2024	
5. Available Attendance Forms:	
Practical lecture	
6. Number of Credit Hours (Total) / Number of Units (Total)	
45 hours/ 3 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Eman Jawad Email: eman.naji@atu.edu.iq	
8. Course Objectives	
Course Objectives	1- He knows the advantages of computer drawing. 2- Recognizes the system interface (AutoCAD), its bars, drawing and adjustment menus. 3- Learns to use the Auto CAD program for drawing electrical and electronic circuits.
1. Teaching and Learning Strategies	
Strategy	1.Explain the material to students in a way that the student learns how to draw using a computer 2.Students apply various drawings and strengthen their skills in dealing with the required drawing a modification instructions. 3.Assessment of students through paintings and exams

2. Course Structure

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	3hr	How to draw and create three-dimensional drawings in the AutoCAD program		practical lecture	Daily exam and boards
2ndweek	3hr	How to draw and create three-dimensional drawings in the AutoCAD program		practical lecture	Daily exam and boards
3rd week	3hr	How to draw and create three-dimensional drawings in the AutoCAD program		practical lecture	Daily exam and boards
4th week	3hr	How to draw and create three-dimensional drawings in the AutoCAD program		practical lecture	Daily exam and boards
5th week	3hr	Electronic electrical codes overview		practical lecture	Daily exam and boards
6th week	3hr	Block, Insert, Block, Attribute		practical lecture	Daily exam and boards
7th week	3hr	How to insert electrical and electronic codes to the program interface		practical lecture	Daily exam and boards
8th week	3hr	Connecting electrical and electronic symbols by fonts and practical applications		practical lecture	Daily exam and boards
9th week	3hr	Practical applications for drawing electrical circuits		practical lecture	Daily exam and boards
10th week	3hr	Practical applications for drawing electrical circuits		practical lecture	Daily exam and boards
11th week	3hr	Practical applications for drawing electrical circuits		practical lecture	Daily exam and boards
12th week	3hr	Practical applications of electronic circuit drawing		practical lecture	Daily exam and boards
13th week	3hr	Practical applications of electronic circuit drawing		practical lecture	Daily exam and boards
14th week	3hr	Practical applications of electronic circuit drawing		practical lecture	Daily exam and boards
15th week	3hr	Practical applications of electronic circuit drawing		practical lecture	Daily exam and boards

3. Course Evaluation

The Distribution of the score out of 100 is according to the following:

1. **Practical:**
    a. Exam= 20 marks
    b. Darwing= 20 marks
2. **daily oral and preparation= 10 Marks**
3. **Final exam** =50 marks

4. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering and electrical drawing
Main references (sources)	Descriptive geometry
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the Engineering and electrical drawing
Electronic References, Websites	All sites and video lectures that are interested in electrical drawir

Course Description Form

1. Course Name:	
Mathematics-2	
2. Course Code:	
R-2	
3. Semester / Year:	
First Year /Second semester	
4. Description Preparation Date:	
05/02/2024	
5. Available Attendance Forms:	
Theoretical lecture	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 2 unit	
7. Course administrator's name	
Name: Eman Jawad Naji Email: eman.naji@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: 1. The student understands the laws and mathematical issues 2. To solve simple and complex electrical circuits using mathematics 3. knows the applications of Engineering Mathematics
9. Teaching and Learning Strategies	
Strategy	1.Discuss the students and ask questions about the topic of the lecture and how to think critically and analytically, and then guide them towards how to solve the problem in a way that suits the topic. 2.Explain the material in a consistent manner commensurate with the initial inquiries and discussions of the topic, in addition to using the available means of explanation that help to consolidate the lesson through solved examples and exercises that provoke brainstorming students. 3.The use of feedback and assessment of the student's comprehension of the material.

10. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	Integration of exponential functions		practical lecture	Solving exercises + daily exam
2ndweek	2hr	Definite integration-applications-the space under the curve-between two curves		practical lecture	Solving exercises + daily exam
3rd week	2hr	Rotational volumes – the length of the curved arc		practical lecture	Solving exercises + daily exam
4th week	2hr	Physical and engineering applications		practical lecture	Solving exercises + daily exam
5,6, 7th week	2hr	General methods of integration, including compensation, segmentation, the use of partial, exponential and logarithmic fractions and their applications		practical lecture	Solving exercises + daily exam
8th week	2hr	Numerical methods in integration – the base of the trapezoid		practical lecture	Solving exercises + daily exam
9,10thweek	2hr	Solving discrete, homogeneous and linear differential equations with their various applications		practical lecture	Solving exercises + daily exam
11thweek	2hr	Complex numbers addition, subtraction, multiplication and division		practical lecture	Solving exercises + daily exam
12th week	2hr	The polar and algebraic formula and the transformation between them and vice versa		practical lecture	Solving exercises + daily exam
13th week	2hr	Powers and roots - representation of roots		practical lecture	Solving exercises + daily exam
14th week	2hr	Statistical operations – frequency distributions – histogram –frequency curve		practical lecture	Solving exercises + daily exam
15th week	2hr	Arithmetic mean-rate-deviation L=Standard-variance-the relationship between the mean and the median		practical lecture	Solving exercises + daily exam

11. Course Evaluation
The Distribution of the score out of 100 is according to the following: **1. Theoretical:** a. First semester = 20 marks b. Second semester= 20 marks **2. daily oral and preparation= 10 Marks** **3. Final exam** Theoretical=50 marks

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Applied mathematics-yaequb sibagha
Main references (sources)	Solving electrical circuits-Joseph Methods for solving differential equations-Khaled Ahmed Samarai-Yahya Abdul said Calculus ((Thomas)) Laplace transformation
Recommended books and references (scientific journals, reports...)	All books and Journals which includes the applied mathematics
Electronic References, Websites	All applied mathematics websites on the internet

Course Description Form

1. Course Name:	
Technical English	
2. Course Code:	
T.E	
3. Semester / Year:	
First year / 1st semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
Theoretical lecture	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Asmaa Adnan Email: asmaa.najm@atu.edu.iq	
8. Course Objectives	
Course Objectives	1. The student should understand the specialty terminology in English 2. Skills objectives for the course. 3. The student learns to speak English and know the terminology
12. Teaching and Learning Strategies	
Strategy	Speak English fluently

13. Course Structure

Theoretical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4	2	Unit -1- Introduction and Review to English language. Introduction to parts of speech. Sentence Patterns.	Introduction to parts of speech	Theoretical lecture	oral examination and quiz
5-6	2	Unit -2- Reading Comprehension and structure (selected scientific passages general to all specializations)	selected scientific passages general to all specializations	Theoretical lecture	oral examination and quiz
7-8	2	Scientific Attitude (Simple present)	Simple present	Theoretical lecture	oral examination and quiz
9-10	2	Mathematics(passive)	Mathematics(passive)	Theoretical lecture	oral examination and quiz
11-12	2	Scientific Methods (simple past)	Scientific Methods (simple past)	Theoretical lecture	oral examination and quiz
13	2	Test	Test	Theoretical lecture	oral examination and quiz
14-15	2	Unit -4- Conversation (from daily life Meeting people	Conversation (from daily life Meeting people	Theoretical lecture	oral examination and quiz
16-17	2	Talking about your job	Talking about your job	Theoretical lecture	oral examination and quiz
18-19	2	Unit -5- The use of library, Dictionary and Internet.	The use of library, Dictionary and Internet.	Theoretical lecture	oral examination and quiz
20-21	2	Unit -6- Translation Selected topics from internet to be translated	Translation Selected topics from internet to be translated	Theoretical lecture	oral examination and quiz
22-25	2	Unit -7- Writing Technical Reports	Writing Technical Reports	Theoretical lecture	oral examination and quiz
25-29	2	Unit -8- Terminology Selected Passages according to specializations	Terminology Selected Passages according to specializations	Theoretical lecture	oral examination and quiz
30	2	Final Test	Final Test	Theoretical lecture	oral examination and quiz

14. Course Evaluation
the Distribution of the score out of 100 is according to the following: **4. Theoretical:** a. First semester = 20 marks b. Second semester= 20 marks **5. daily oral and preparation= 10 Marks** **6. Final exam** a. Theoretical=50 marks

15. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Technical language book project
Main references (sources)	Technical language book project
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Principles Of Computer	
2. Course Code:	
PoC	
3. Semester / Year:	
First year / second semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Hawraa Neama Jasim Email: hawraa.jasim.iba9@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: Teaching the student to be familiar with the basic rules of dealing with the computer and its management to h him in the completion of projects, Printing, statistics and graphic preparation, presentation creation engineering chart designs And, the advent of the Internet as a means of communication accessible to all become very necessary that the student learns to use the role of the Internet in many fields, including educat scientific research, trade and marketing by electronic correspondence, web pages and electronic speaking.
9. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include mos the questions that can be asked about the topic and will be answered during the lecture. Students will be taken thro a discussion in order to find the pre answers to those questions. This is followed by a detailed explanation of the t by which many examples and solutions are given. Moreover, the lecture includes different educational videos wh would virtually clarify the topic. At the end of the lecture, and to ensure that all students have understood the ba of the topic, students are discussed by various questions. On the other hand, during the practical lecture, the stud are given the lecture as mentioned above, in addition to the practical application, which includes connecting the l circuits and recording the data obtained from the circuit in order to be compared with the theoretical results, and t writing a detailed report on the experiment and its results.

10. Course Structure

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2hr	PowerPoint runs it, program interfaces, and file tab	introduction	practical lecture	oral examination and writing report
2nd week	2hr	Open a presentation file, save a new one, and save an inventory presentation in another format	presentation file	practical lecture	oral examination and writing report
3rd week	2hr	Open a stock presentation, close a show, print slides on paper, and the home tab	home tab	practical lecture	oral examination and writing report
4th week	2hr	Set up the page, theme group, and slide show tab background	slide show tab	practical lecture	oral examination and writing report
5th week	2hr	View tab, Presentation Views group, and Master View group	View tab	practical lecture	oral examination and writing report
6th week	2hr	Show group, orientation, color group, and grayscale	View tab	practical lecture	oral examination and writing report
7th week	2hr	Zoom group, window group, and help instructions	View tab	practical lecture	oral examination and writing report
8th week	2hr	Insert objects, add animations, add shapes, group drawing, and edit	Insert tab	practical lecture	oral examination and writing report
9th week	2hr	Insert tab, table set, and picture set	Insert tab	practical lecture	oral examination and writing report
10th week	2hr	Illustrations, links, group, text, and icons	Insert tab	practical lecture	oral examination and writing report
11th week	2hr	Add animations for slides and objects, transition tab, and preview set and a move-to-slide group	transition tab	practical lecture	oral examination and writing report
12th week	2hr	Timing group, animation tab, preview group, and animation set	transition tab	practical lecture	oral examination and writing report
13th week	2hr	A custom animation group and a timing group	transition tab	practical lecture	oral examination and writing report
14th week	2hr	Solve the book's questions	Solve eq.s	practical lecture	oral examination and writing report
15th week	2hr	Comprehensive exam as a review	Review	practical lecture	oral examination and writing report

11. Course Evaluation	
The Distribution of the score out of 100 is according to the following: Continuous evaluation to be 100%	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Computer Fundamentals and Desktop Applicati Part II/Microsoft office 2010
Main references (sources)	PowerPoint 2010 Advanced Slides, Animation Layouts. Stephen Moffat, The Mouse Train Company
Recommended books and references (scientific journals, reports…)	All books and magazines concerned with compu principles and applications
Electronic References, Websites	All websites and video lectures related to compu principles and applications

Course Description Form

1. Course Name:	
Principles Of Computer	
2. Course Code:	
PoC	
3. Semester / Year:	
First year / second semester	
4. Description Preparation Date:	
03/02/2024	
5. Available Attendance Forms:	
laboratory + scientific visits	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours/ 4 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Hawraa Neama Jasim Email: hawraa.jasim.iba9@atu.edu.iq	
8. Course Objectives	
Course Objectives	At the end of the course the student will be able to: Teaching the student to be familiar with the basic rules of dealing with the computer and its management to l him in the completion of projects, Printing, statistics and graphic preparation, presentation creation engineering chart designs And, the advent of the Internet as a means of communication accessible to all become very necessary that the student learns to use the role of the Internet in many fields, including educat scientific research, trade and marketing by electronic correspondence, web pages and electronic speaking.
9. Teaching and Learning Strategies	
Strategy	At the beginning of every theoretical lecture, there is an introduction to the lecture topic. This would include mos the questions that can be asked about the topic and will be answered during the lecture. Students will be taken thro a discussion in order to find the pre answers to those questions. This is followed by a detailed explanation of the t by which many examples and solutions are given. Moreover, the lecture includes different educational videos wh would virtually clarify the topic. At the end of the lecture, and to ensure that all students have understood the ba of the topic, students are discussed by various questions. On the other hand, during the practical lecture, the stud are given the lecture as mentioned above, in addition to the practical application, which includes connecting the l circuits and recording the data obtained from the circuit in order to be compared with the theoretical results, and t writing a detailed report on the experiment and its results.

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1st week	2hr	PowerPoint runs it, program interfaces, and file tab	introduction	practical lecture	oral examination and writing report
2nd week	2hr	Open a presentation file, save a new one, and save an inventory presentation in another format	presentation file	practical lecture	oral examination and writing report
3rd week	2hr	Open a stock presentation, close a show, print slides on paper, and the home tab	home tab	practical lecture	oral examination and writing report
4th week	2hr	Set up the page, theme group, and slide show tab background	slide show tab	practical lecture	oral examination and writing report
5th week	2hr	View tab, Presentation Views group, and Master View group	View tab	practical lecture	oral examination and writing report
6th week	2hr	Show group, orientation, color group, and grayscale	View tab	practical lecture	oral examination and writing report
7th week	2hr	Zoom group, window group, and help instructions	View tab	practical lecture	oral examination and writing report
8th week	2hr	Insert objects, add animations, add shapes, group drawing, and edit	Insert tab	practical lecture	oral examination and writing report
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10th week	2hr	Illustrations, links, group, text, and icons	Insert tab	practical lecture	oral examination and writing report
11th week	2hr	Add animations for slides and objects, transition tab, and preview set and a move-to-slide group	transition tab	practical lecture	oral examination and writing report
12th week	2hr	Timing group, animation tab, preview group, and animation set	transition tab	practical lecture	oral examination and writing report
13th week	2hr	A custom animation group and a timing group	transition tab	practical lecture	oral examination and writing report
14th week	2hr	Solve the book's questions	Solve eq.s	practical lecture	oral examination and writing report
15th week	2hr	Comprehensive exam as a review	Review	practical lecture	oral examination and writing report

11. Course Evaluation

The Distribution of the score out of 100 is according to the following:
Continuous evaluation to be 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Computer Fundamentals and Desktop Applications Part II/Microsoft office 2010
Main references (sources)	PowerPoint 2010 Advanced Slides, Animation and Layouts. Stephen Moffat, The Mouse Training Company
Recommended books and references (scientific journals, reports…)	All books and magazines concerned with computer principles and applications
Electronic References, Websites	All websites and video lectures related to computer principles and applications