Ministry of Higher Education and Scientific Research
Scientific Supervision and Evaluation Authority
Quality Assurance and Academic Accreditation Directorate/
Accreditation Division

Description of the Academic Program and Course Syllabus

Department of Electronic Engineering and Communications Technology

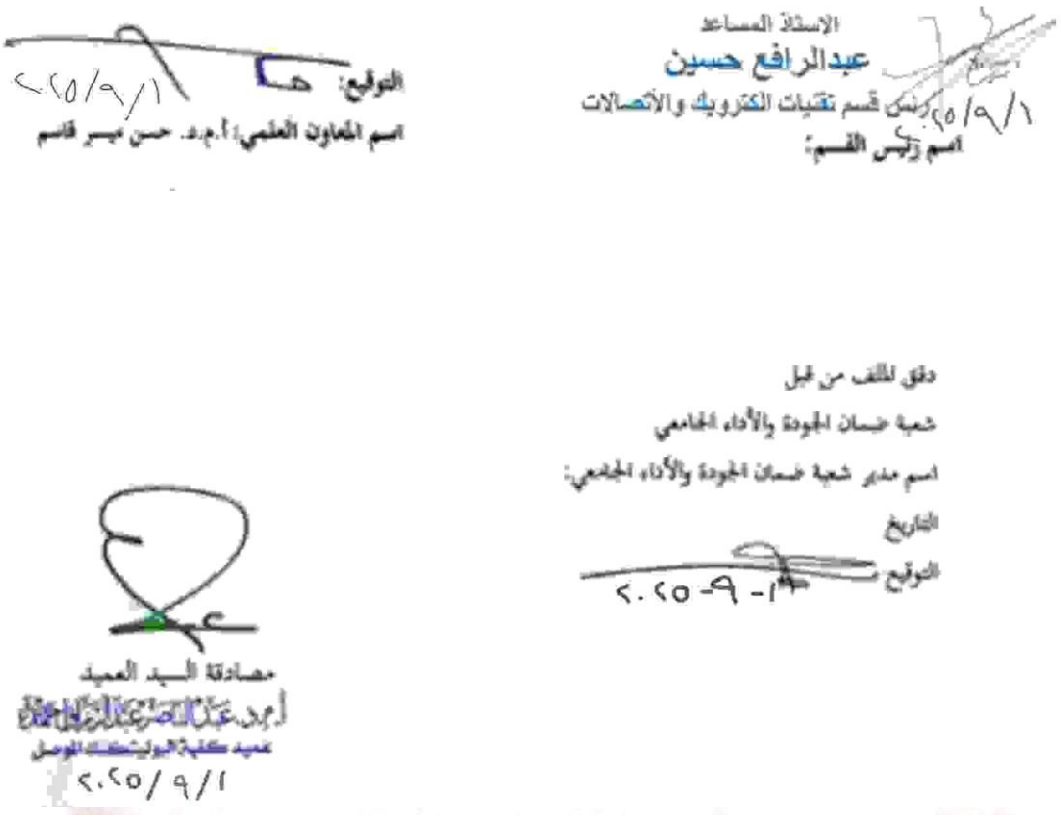
2026 - 2025

Academic Program Description Template

University Name: Northern Technical University
College or Institute: Mosul Polytechnic College
Department: Department of Electronic Engineering and Communications Technologies

Name of Academic Program: Diploma / Bachelor's Degree: Electronic and Communications Engineering Technology
Name of Final Degree: Diploma / Bachelor's Degree: Electronic and Communications Engineering Technology
Academic System: Bologna Process

Date Updated: 1 – 9 - 2025



Academic Program Description

Northern Technical University

Mosul Polytechnic College

Department of Electronic Engineering and Communications Technologies

Diploma / Bachelor's Degree: Electronic Engineering and Communications Technologies

Education System: Bologna System

1.Program vision

Vision:

The Department of Electronic Engineering and Communications Technologies serves society and its various institutions by adopting both theoretical and practical foundations to educate a generation capable of working with modern electronic and communication systems and keeping pace with rapid technological advancements in the design and development of advanced devices and systems. The department also provides the essential knowledge required to engage with communication technologies across their diverse fields. The Department of Electronic Engineering and Communications Technologies is committed to a path characterized by effectiveness, efficient service, and the highest standards of professional ethics.

2. Program Mission

Mission:

The Department of Electronic Engineering and Communications Technologies strives to provide its students with the highest level of academic and practical education through application-oriented curricula in electronics and communications. These programs prepare graduates to enter the labor market and respond effectively to the needs of the local community in this field. The department is also committed to developing distinguished academic professionals whose excellence contributes to technology transfer and supports the requirements of national development.

3- Program objectives

Objectives:

The Department of Electronic Engineering and Communications Technologies aims to equip students with the theoretical knowledge and practical skills required to pursue professions related to communications and electronics technologies through the following objectives:

1. Study, analyze, and design various analog and digital communication circuits, as well as monitor and control communication networks by acquiring, interpreting, and ensuring the stability of transmitted information.
2. Train students in the use of modern laboratory equipment and advanced software for conducting and simulating practical experiments within a continuous plan for the development of curricula and educational programs.
3. Prepare qualified technical and engineering professionals with the competencies required to operate and maintain electronic devices, enabling them to meet the needs of society and

work effectively in both the public and private sectors.

4. Promote professional ethics and develop students' teamwork and collaborative skills.

4-Program accreditation:
nothing

5-Other external influences:
nothing

6- Program Structure for the First and Second Levels:

Program Structure	Number of Courses	Study Unit	Percentage	Notes *
University requirements	8	24		
College Requirements	3	8		
Department requirements	21	79		
summer training		completed		
Other	/	None		

رمز		SSWL	USSWL	ECTS	نوع	طلب مسبق
NTU 100	الديمقراطية وحقوق الانسان	63	37	4.00	S	
NTU 101	اللغة الانكليزية	33	17	2.00	S	
ECT 100	اسس الهندسة الالكترونية	108	42	6.00	C	
ECT 101	الرياضيات	63	87	6.00	S	
ECT 102	الرسم الهندسي	93	57	6.00	B	
ECT 103	الهندسية الميكانيكية	93	57	6.00	B	
		453	297	30		

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

A- Cognitive objectives

A1- Providing the graduate with the necessary knowledge to manage electronic systems of various types and categories and how to deal with them and use them in the best possible way.

A2- Providing the graduate with the necessary knowledge of computer devices and how to deal with their hardware and installation.

A3- Providing the graduate with basic information in the field of computer specialization, starting from choosing the most appropriate devices, passing through the basics of operation, reaching assembly and maintenance of both software and electronic hardware types

A4- Providing the graduate with the necessary knowledge to manage control and command systems and knowledge of industrial automation systems and ways to deal with modern devices and machines.

A5- Preparing the graduate to be ready to enter the labor market and enabling him to understand scientific developments in the field of computers, their networks and modern electronic devices, in addition to preparing him to deal with modern machines and advanced and rapidly developing technology.

A6- Preparing the graduate to be able to use various electronic inspection devices in his field of specialization.

A7- Providing the graduate with the required knowledge and skills to deal with any modern electronic device and the ability to prepare the necessary reports for these devices and indicate their suitability for work.

B - Program specific skill objectives

B1 - Providing the graduate with the necessary information about electronic components manufactured from semiconductors of different types, how to manufacture them, their basic properties, the function of each electronic component, and methods of installing them in different electronic circuits.

B2 - Knowing the methods of examining electronic components and how to obtain basic electrical signals, as well as their practical applications in various household and personal devices such as modern communications devices, satellite receivers, audio and visual multimedia devices.

B3 - Preparing the graduate to be able to solve technical problems in the fields of electronics and various communications, how to perform periodic maintenance for them, and analyze the causes of their malfunctions and ways to overcome them.

B4 - Providing the graduate with the initial skills necessary to design simple practical electronic circuits using microcontrollers and programmable logic controllers, and how to connect the machine to the

computer and control it.

9. Teaching and learning methods

1. Theoretical lectures
2. Practical lectures (laboratories) 3.
Workshops of all kinds
4. Audio and visual aids
5. Scientific films
6. Scientific field visits
7. Summer training

10. Evaluation Methods

1. Daily quick tests (oral and written)
2. Midterm and final exams
3. Homework
4. Daily or weekly practical reports
5. Immediate evaluation of performance in workshops and laboratories
6. Study sessions
7. Performing a distinctive extracurricular activity
8. Discussing graduation projects

C- Emotional and value-based objectives.

A1- He has academic and technical information, experience and skill in the field of electronics, communications and software.
A2- He can keep pace with the rapid development in the field of modern electronic devices, including communications, control systems, computers, their systems and all their networks.
A3- He can manage, prepare and implement periodic programs for maintenance, sustainability and development.
A4- He has knowledge and awareness of how to install, operate and test practical electronic circuits.
A5- He has the mental ability to install and program transmitters, receivers and cameras of all kinds.
A6- He has full knowledge and awareness of everything new and advanced in the science of communications and electronics devices of all kinds and their uses

11-The teaching staff

Faculty members

Academic rank	specialization		Special requirements/skills (if any)		preparation of the teaching staff	
	general	Specialized			lecturer	staff
Assistant Professor	Electrical Engineering	Electronics & Communications			staff	
Lecturer	Electrical Engineering	Communications			staff	
Lecturer	Electrical Engineering	Power Electronics			staff	

Lecturer	Computer Engineering	Computer Engineering			staff
Assistant Lecturer	Communications Engineering	Communications Engineering			staff
Assistant Lecturer	Electrical Engineering	Electrical Engineering			staff
Assistant Lecturer	Computer Technology Engineering	Computer Technology Engineering			staff
Assistant Lecturer	Electrical Engineering	Electronics & Communications			staff
Assistant Professor	Electrical Engineering	Electronics & Communications			staff
Assistant Lecturer	Communications Engineering	Communications Engineering			staff
Lecturer	Electrical Engineering	Electrical Engineering			staff
Lecturer	Management and Economics	Management & Economics			staff
Assistant Lecturer	Computer Technology Engineering	Computer Technology Engineering			staff
Assistant Professor	Computer Technology Engineering	Computer Technology Engineering			staff

12-Professional development
Orienting new faculty members
Professional development
Professional development for faculty members

13-Acceptance criterion
1-Average 2- Desire 3- Corresponding specialization in vocational secondary schools.

14- The most important sources of information about the program
-External sources (the Internet) - Scientific research and its latest developments -Methodological books

15-Program development plan

1- Learn about recent scientific developments.
2- Participation in international and local conferences.
3- Participation in scientific workshops inside and outside Iraq.
4- Hosting scientific competencies in the field of specialization

Level 1 Syllabus

University Requirements (10-15) %	Course name				UNIT	code
	Arabic Language	English Language	Th	P		
	حقوق الانسان والديمقراطية	Human Rights and Democracy	2	0	2	NTU100
	اللغة الانكليزية	English Language	1	1	2	NTU101
	مبادئ الحاسوب 1	Principles of Computer 1	2	0	2	NTU102
	اللغة العربية	Arabic Language	2	0	2	NTU103
	الرياضة (اختياري)	Sport	1	1	2	NTU105
	اللغة الفرنسية (اختياري)	French Language	2	0	2	NTU106
		Total university requirements units			10	
Requirements of the (institute or college)16-22) %	الرياضيات	Mathematics	2	0	2	TIMO100
	معامل ميكانيك	Mechanical Workshop	0	3	3	TIMO101
	رسم هندسي	Engineering Drawing	0	3	3	TIMO102
	تفاضل وتكامل	Calculus	2	0	2	TIMO103
		Total units of formation requirements (institute-college)			10	
Department Requirements (63-74) %	فيزياء الالكترونيات	Electronics physics	2	2	4	ETEC100
	دوائر التيار المستمر	DC Current Circuits	2	2	4	ETEC101
	أساسيات الدوائر الرقمية	Fundamentals of Digital Circuits	2	2	4	ETEC102
	ورشة إلكترونية	Electronic Workshop	0	3	3	ETEC103
	برمجة الحاسوب	Computer Programming	2	2	4	ETEC104
	مبادئ الألكترونيك	Principles of Electronics	2	2	4	ETEC105
	دوائر التيار المتناوب	AC Current Circuits	2	2	4	ETEC106
	الدوائر الرقمية	Digital Circuits	2	2	4	ETEC107
	الرسم كهربائي	Electrical Drawing	0	3	3	ETEC108
	ورشة كهربائية	Electrical Workshop	0	2	2	ETEC109
		Total units of department requirements			**36**	

Requirement type	Course name				UNIT	code
	Arabic Language	English Language	Th	P		
University Requirements (10-15) %	اللغة الانكليزية	English Language	2	0	2	NTU200
	اخلاقيات المهنة	Professional Ethics	2	0	2	NTU201
	جرائم حزب البعث	Baath Party Crimes in Iraq	2	0	2	NTU202
	اللغة العربية	Arabic Language	1	1	2	NTU202
	مبادئ الحاسوب 1	Computer	2	0	2	NTU201
		Total university requirements units			10	
Requirements of the (institute or college (16-22) %	مشروع بحث	Research Project	2	0	2	TIMO200
	ورشة تخصصية	Specialized Workshop	0	3	3	TIMO201
	مشروع تطبيقي	Application Project	0	2	2	TIMO202
	سلامة مهنية	Professional safety	2	0	2	TIMO203
		Total units of formation requirements (institute-college)			9	
Department Requirements (63-74) %	القياسات الكهربائية والمتحسسات	Electrical Measurements and Sensors	2	2	4	ETEC200
	دوائر الكترونية اساسية	Basic Electronic Circuits	2	2	4	ETEC201
	مبادئ الحاسوب الدقيق	Principles of Microcomputer	2	2	4	ETEC202
	أساسيات الاتصالات التناظرية	Fundamentals of Analog Communication	2	2	4	ETEC203
	دوائر الكترونية متقدمة	Advanced Electronic Circuits	2	2	4	ETEC204
	برمجة المعالج الدقيق	Microprocessor programming	2	2	4	ETEC205
	الاتصالات الرقمية	digital communication	2	2	4	ETEC206
	اجهزة وسائط متعددة	Multimedia devices	2	2	4	ETEC207
	اتصالات وسائط متعددة	Multimedia communications	2	2	4	ETEC208
	متحكمات سيطرة مبرمجة	Programmable Logic Controller (PLC)	1	2	3	ETEC209
	منظومات الطاقة المتجددة (إختياري)	Renewable energy systems	2	2	4	ETEC210
	نظم السيطرة(اختياري)	Control systems	2	2	4	ETEC211
		Total units of department requirements			43	

Program skills chart																			
Learning outcomes required from the program																			
Year/level	Course code	Course name	Essential or optional	Knowledge				skills				values				Knowledge			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
First	**NTU 100**	**Democracy and Human Rights**	Essential			√				√			√						
	NTU 101	**English language 1**	Essential		√			√					√						
	NTU 102	**Computer 1**	Essential	√			√	√					√						
	NTU 103	**Arabic language 1**	Essential	√				√					√						
	NTU 104	**sport**	optional	√				√					√						
	ETEC101	**DC Circuits**	Essential	√	√	√		√	√	√		√	√	√	√	√	√	√	√
	ETEC102	**Digital Circuits Basics**	Essential	√	√			√	√	√	√	√	√	√	√	√	√	√	√
	ETEC107	**Digital Circuits**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	ETEC106	**AC Circuits**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	ETEC104	**Computer Programming**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	ETEC100	**Electronic Physics**	Essential	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√
	ETEC105	**Electronic Principles**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

	NTU103	**Arabic Language**	Essential	√	√	√	√	√	√			√	√			√	√		
	TIMO102	**Engineering Drawing**	Essential	√	√	√		√	√			√	√			√	√		
	ETEC108	**Electrical Drawing**	Essential	√	√	√		√	√	√		√	√			√	√		
	TIMO100	**Mathematics**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	TIMO103	**Calculus**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Second	**NTU 101**	**English Language 1**	Essential	√	√			√					√						
	NTU201	**Computer 2**	Essential	√				√				√							
	NTU202	**Arabic language 2**	Essential	√				√				√	√						
	NTU 203	**Crimes of the Baath Regime in Iraq**	Essential	√				√				√	√						
	NTU 204	**Professional Ethics**	Essential	√				√					√						
	ETEC211	**Control**	Essential	√	√	√	√	√	√	√	√	√	√	√		√	√	√	√
	ETEC201	**Basic Electronic Circuits**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	ETEC204	**Advanced Electronic Circuits**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	ETEC203	**Fundamentals of Analog Communication**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	ETEC206	**digital communication**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	ETEC209	**Programmable Logic Controller (PLC)**	Essential	√	√			√				√	√			√	√		
	ETEC205	**Microprocessor programming**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	ETEC208	**Multimedia communications**	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

	ETEC207	**Multimedia devices**	√	√	√	√	√	√	√			√	√					

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Mosul Technical Institute/ Electronic and Communications Techniques
3. Course title/code	Democracy and Human Rights NTU100
4. Programme (s) to which it contributes	Technical Diploma
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical) * Scientific discussions, seminars, other activities
6. Semester/Year	Annual
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	1 / 9 / 2025

9. **Aims of the Course**

1 - Providing students with basic concepts related to democracy and human rights.

2- Knowledge of political systems, methods of elections and public freedoms.

3- Developing the legal and constitutional culture among students.

10. Course outcomes and teaching, learning and evaluation methods

A. Cognitive objectives

1- Enabling students to understand the concept of democracy and the rights to be implemented in the field of human rights.

2- Developing the knowledge aspects of the constitution, the legal state and human rights guarantees.

B - The skills objectives of the course.

Enable students to understand the concept of democracy and the rights to be done in the field of human rights and how to defend these rights. And know the guarantees related to them.

Teaching and learning methods

((Theoretical lectures / interactive lectures))

Evaluation methods

((Oral tests / written tests / weekly reports / daily attendance / participation and interaction in lectures / semester and final exams))

C- Emotional and value goals

Carrying out duties in the workplace with professional motives

Teaching and learning methods

((Theoretical lectures / seminars / debate work between students))

Evaluation methods

((Oral Tests / Written Tests / Observation / Student Cumulative Record))

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

Understand the concept of democracy and the rights to be implemented in the field of human rights.

11. Course Structure

Week	Hours	Unit/Module or Topic Title	ILOs	Teaching Method	Assessment Method
1	2	Human rights, definition, objectives Human rights in ancient civilizations / Human rights in heavenly laws	Knowledge and application	Theoretical	Tests & Reports
2	2	Human Rights in Contemporary and Modern History (International Recognition of Human	Knowledge and application	Theoretical	Tests & Reports

		Rights since the First World War and the League of the United Nations) / Regional Recognition of Human Rights: European Convention on Human Rights 1950, American Convention on Human Rights 1969, African Charter on Human Rights 1981, Arab Charter on Human Rights 1994			
3	2	NGOs and human rights (ICRC, Amnesty International, Human Rights Watch, National Human Rights Organizations	Knowledge and application	Theoretical	Tests & Reports
4	2	Human rights in Iraqi constitutions between theory and reality / the relationship between human rights and public freedoms: -1In the Universal Declaration of Human Rights. -2In regional charters and national constitutions.	Knowledge and application	Theoretical	Tests & Reports
5	2	Economic, social and cultural human rights , Civil and political human rights / Modern human rights : Facts in development , Right to clean environment , Right to solidarity , Right to religion	Knowledge and application	Theoretical	Tests & Reports
6	2	Guarantees of respect and protection of human rights at the national level, guarantees in the Constitution and laws, guarantees in the principle of the rule of law, guarantees in constitutional oversight, guarantees in freedom of the press and public opinion, the role of non-governmental organizations in respecting and protecting human rights / guarantees, respect and protection of human rights at the international level: .1Role of the United Nations and its specialized agencies in providing safeguards -2The role of regional organizations (Arab League, European Union, African Union, Organization of American States, ASEAN.(.3Role of international, regional non-governmental organizations and public opinion in respecting and protecting human rights	Knowledge and application	Theoretical	Tests & Reports
7	2	The general theory of freedoms: the origin of rights and freedoms, the legislator's position on public rights and freedoms, the use of the term public freedoms	Knowledge and application	Theoretical	Tests & Reports
8	2	Organizing public freedoms from the previousness of equality: the historical development of the concept of equality The modern development of the idea of equality -Gender equality -Equality between individuals according to their beliefs and race to public authorities	Knowledge and application	Theoretical	Tests & Reports
9	2	Freedom of learning , freedom of the press , freedom of assembly Freedom of association, freedom of work Right of ownership	Knowledge and application	Theoretical	Tests & Reports
10	2	Freedom of trade and industry Freedom of security and a sense of security Freedom to go and return Freedom of trade and industry Women's freedom	Knowledge and application	Theoretical	Tests & Reports

11	2	Scientific and technical progress and public freedoms The future of public freedoms	Knowledge and application	Theoretical	Tests & Reports
12	2	The crime of genocide	Knowledge and application	Theoretical	Tests & Reports
13	2	Democracy, its characteristics and types	Knowledge and application	Theoretical	Tests & Reports
14	2	Elections, their definition and types	Knowledge and application	Theoretical	Tests & Reports
15	2	Contemporary political systems	Knowledge and application	Theoretical	Tests & Reports

1. Infrastructure	
Required reading:	Available in free education and institute library
Main references (sources)	Available in free education and institute library
B - Electronic references, Internet sites...	Internet

2. Course development plan
1- Developing curricula appropriate to human rights developments. 2- Dividing the article into two parts, the first related to human rights and the second to democracy.

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Mosul Technical Institute/ Electronic and Communications Techniques
3. Course title/code	Computier1 **NTU102**
4. Programme (s) to which it contributes	Technical Diploma
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical and practical) * Scientific discussions, seminars, other activities
6. Semester/Year	Annual
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	1 / 9 / 2025
9. **Aims of the Course** 1- Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization. 2- Perform his duties at the workplace for professional motives.	
10. Course outcomes and teaching, learning and evaluation methods	
A. Cognitive objectives A1-Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization.	
B - The skills objectives of the course. B1 - Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization.	
Teaching and learning methods	
((Theoretical lectures / practical lectures / field visits / solving examples / seminars / summer training))	
Evaluation methods	
((Oral exams / written tests / weekly reports / daily attendance / semester and final exams))	
C- Emotional and value goals C1- Perform his duties at the workplace for professional motives.	
Teaching and learning methods	
((Theoretical lectures / practical lectures / field visits / solving examples / seminars / summer training))	

Evaluation methods
((Oral Tests / Written Tests / Observation / Student Cumulative Record))
D - Transferable general and qualifying skills (other skills related to employability and personal development). D1- Improve their discussion skills. D2- Raising their research perceptions and transferring the student from the stage of teaching to learning.

11. Course Structure

Week	Hours	Unit/Module or Topic Title	ILOs	Teaching Method	Assessment Method
2&1	2	Introduction to the computer / computer system / information technology / types of computers / input units / central processing unit / output units / main memory and its types / data storage in memory / factors affecting computer performance Definition of software and its types / systems software: operating systems / programming languages and software systems / applied software.	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
3	2	Introduction to Windows / its features / operating the device / shutting down the device / using the mouse / windows screen components: taskbar: icons: and their types (standard and general.(	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
4	2	Control Panel / Desktop Control / Screen Saver / Window Colors and Lines / Screen Settings / Adjust Screen Colors / Modify Time and Date / Volume / Change Between Mouse Buttons / Double-Click Speed Control / Change Mouse Pointer / Control Mouse Speed / Install and Uninstall Programs	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
5	2	Minimize and enlarge the window / final closure / temporary closure / move the window / control the capacity of the window / ways to run applications and programs	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
6	2	Order start menu items / delete start menu items / add submenu to start menus / add new button to start menu	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
7	2	Basic System Information / Stop Unwanted Applications Windows explorer window finder / My computer icon / my computer window parts	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
8&9	2	Recycle Bin (delete, retrieve and empty the basket) / My Document icon	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
10&11	2	Definition of files and folders / Identification of files and folders / Properties of files Definition of folders / Create files and folders / Change the name of files and folders / Move file or folder / Copy file or folder / Search for file or folder / Create a shortcut icon for an application or file	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
12&13	2	Calculator / Notepad / WordPad / Use the memo to edit and create the file	Knowledge and practical	Practical + Theoretical	Tests & Discussion

		Paint / Screen components / Create drawings / Select front and background colors / Choose brush font size / Select and select the drawing tool / Save drawing / Make drawing desktop background / Quit Paint Entertainment programs Media player	application		
14&15	2	Viruses / Reason for naming / Definition / Ways of spreading the virus / Symptoms of infection with the virus / Protection methods / Types of viruses Computer crimes / theft / hackers	Knowledge and practical application	Practical + Theoretical	Tests & Discussion

12.Infrastructure	
Required reading:	Available in the free department and library of the institute
Main references (sources)	Available in the free department and library of the institute
Recommended books and references (scientific journals, reports,...)	Internet

13.Course development plan
1- Developing curricula adapted to the labor market 2- Holding seminars and scientific conferences aimed at updating the curricula 3- Follow-up scientific developments in the field of specialization

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Mosul Technical Institute/ Electronic and Communications Techniques
3. Course title/code	Arabic Language NTU103
4. Programme (s) to which it contributes	Technical diploma
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical) * Discussions and reports
6. Semester/Year	Annual
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	1- 9 - 2025
9. **Aims of the Course** 1- Enabling the student to read correctly. 2- Enabling the student to write correctly and use punctuation marks. 3- The student should acquire the ability to use the Arabic language correctly. 4- Introducing the student to the correct Arabic language words, structures and sound methods in an interesting way. 5- Accustom the student to sound and clear expressions of his ideas. 6- Helping the student to understand complex structures and mysterious methods.	
10. Course outcomes and teaching, learning and evaluation methods	
A.Cognitive objectives	

A- The student should recognize common mistakes in writing Arabic in order to avoid them B - The student should recognize the punctuation marks and use them correctly C - The student should distinguish between the solar lam and the lunar lam, which helps to pronounce it correctly D - The student differentiates between Dhad and Zaa, and this is what helps him to avoid falling into a spelling error E - To distinguish between the verb, the noun and the letter, as this is what his Arabic speech is based on. F- He must be able to write the hamza in its correct position correctly.
B - The skills objectives of the course. B1 – Providing the student with a linguistic wealth that makes him more able to correctly express what he wants. B2- Correcting the student's tongue and preventing it from error
Teaching and learning methods
((Theoretical lectures / listening lectures / conversation lectures / interactive lectures / research in libraries and the Internet on specific topics)).
Evaluation methods
((Oral tests / written tests / weekly reports / daily attendance / participation and interaction in lectures / semester and final exams))
C- Emotional and value goals C1- Thinking, activation and organization development C2- Working to make the student's imagination fertile imagination by highlighting the aesthetics of the language and thus enabling him to express the essence of the soul in a proper way.
Teaching and learning methods
((Theoretical lectures / seminars / conducting debates between students / making reports))
Evaluation methods
((Oral Tests / Written Tests / Observation / Student Cumulative Record))
D - Transferable general and qualifying skills (other skills related to employability and personal development). D1- The ability to develop and develop his expressive skills such as poetry and story. D2- The ability to communicate with the outside world properly.

11. Course Structure

Week	Hours	Unit/Module or Topic Title	ILOs	Teaching Method	Assessment Method
1	2	Introduction to linguistic errors – Taa Al-Marbouta and Al-Taa Al-Maktaba	1. Identify the types of linguistic errors. 2. Differentiate between open Taa and Taa tethered	Discussion method, lecture method	Oral test
2	2	Rules for writing the elongated and compartment thousand – solar and lunar letters	1. Differentiate between the writing of the extended thousand and the	Discussion method, lecture	Oral test

			compartment and the positions of the writing of the two thousand 2. Differentiate between solar letters and lunar letters	method	
3	2	Al-Daad and Al-Zaa	Differentiate between Dhad and Z	Discussion method, lecture method	Oral test
4	2	Hamza writing	Enable the student to write the hamza correctly	Discussion method, lecture method	Oral test
5	2	Punctuation	Recognize punctuation and write it in the correct location	Discussion method, lecture method	Oral test
6	2	Noun and verb and differentiate between them	1.Recognize the noun and verb and indicate the sign of each 2. Differentiate between noun and verb 3. Indication of the types of verb 4. Differentiate between types of verbs	Discussion method, lecture method	Oral test
7	2	Effects	identify the types of effects and differentiate between them	Discussion method, lecture method	Oral test
8	2	Number	Enable the student to write numbers correctly	Discussion method, lecture method	Oral test
9	2	Applications of common linguistic errors	Recognize and avoid common language errors	Discussion method, lecture method	Oral test
10	2	Applications of common linguistic errors	Recognize and avoid common language errors	Discussion method, lecture method	Oral test
11	2	Noon and Tanween meanings of prepositions	1. Differentiate between Nun and Tanween 2.Recognize the meanings of prepositions	Discussion method, lecture method	Oral test
12	2	Formal aspects of administrative discourse	Identify the formal aspects of administrative discourse	Discussion method, lecture method	Oral test
13	2	The language of administrative discourse	Recognize the language of administrative discourse	Discussion method, lecture method	Oral test
14	2	The language of administrative discourse	Recognize the language of administrative discourse	Discussion method, lecture method	Oral test
15	2	Samples of administrative	Identify samples of	Discussion	Oral test

		correspondence	administrative correspondence	method, lecture method	

12.Infrastructure	
Required reading:	Textbooks: General Arabic Language Binding for Technical Universities by (Dr. Safaa Kazem Makki and Dr. Lama Muhammad Younis
Main references (sources)	1- Clear dictation: Abdul Majeed Al-Nuaimi, Daham Al-Kayyal, Dar Al-Mutanabbi Library, Baghdad, 6th edition, 1987 AD. 2- Lessons in language, grammar and spelling for state employees: Ismail Hammoud Atwan and others, Ministry of Education Press No. (3), Baghdad, 2nd edition, 1984. 3- Arabic language for the third intermediate grade: Fatima Nazem Al-Attabi, et al., 1st edition, 2018. 4 - General Arabic language for sections other than specialization: Abdul Qadir Hassan Amin and others, Ministry of Higher Education and Scientific Research, 2nd Edition, 2000. 5- Inspired by Arabic literature: Haval Muhammad Amin, Al-Saadoun Press, Baghdad.
Electronic references, Internet sites...	World Wide Web

13.Course development plan
Correcting the linguistic errors that occurred in the manual to be taught and trying to add a definition to some of the terms contained in the fascicle, especially since the Arabic language fascicle was prepared for non-specialists in the Arabic language, and this leads to making the prescribed vocabulary more accurate and clear.

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Mosul Technical Institute/ Electronic and Communications Techniques
3. Course title/code	Sport NTU104
4. Programme (s) to which it contributes	Technical Diploma
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical and practical) * Sports discussions and activities
6. Semester/Year	Annual
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	1- 9 - 2025
9. **Aims of the Course** 1- The student should be able to identify the most important types of sports and what are the laws and skills of some sports 2- Identify the motor mechanism of the human body and what are the common injuries that occur in the human body. 3. Perform his duties at the workplace for professional motives.	
10. Course outcomes and teaching, learning and evaluation methods	
A. Cognitive objectives A1- The student should be able to identify the most important types of sports and what are the laws and skills of some sports	
B - The skills objectives of the course.	

B1- Identify the motor mechanism of the human body and what are the common injuries that occur in the human body.
Teaching and learning methods
((Theoretical lectures / practical lectures / field visits / solving examples / seminars))
Evaluation methods
((Oral exams / written tests / weekly reports / daily attendance / semester and final exams))
C- Emotional and value goals C1- Perform his duties at the workplace for professional motives.
Teaching and learning methods
((Theoretical lectures / practical lectures / field visits / solving examples / seminars))
Evaluation methods
((Oral Tests / Written Tests / Observation / Student Cumulative Record))
D - Transferable general and qualifying skills (other skills related to employability and personal development). D1- Improve their discussion skills. D2- Raising their research perceptions and transferring the student from the stage of teaching to learning.

11. Course Structure

Week	Hours	Unit/Module or Topic Title	ILOs	Teaching Method	Assessment Method
1	2	Sport definition, importance and types	Knowledge and practical application	theoretical and practical	Tests & Reports
2	2	The mechanism of movement of the human body	Knowledge and practical application	theoretical and practical	Tests & Reports
3	2	Common sports injuries	Knowledge and practical application	theoretical and practical	Tests & Reports
4	2	Basic skills of the game of basketball	Knowledge and practical application	theoretical and practical	Tests & Reports
5	2	International Basketball Law	Knowledge and practical application	theoretical and practical	Tests & Reports
6	2	Basic skills of table tennis and its international law	Knowledge and practical application	theoretical and practical	Tests & Reports
7	2	Basic skills of volleyball and its international law	Knowledge and practical application	theoretical and practical	Tests & Reports
8	2	Swimming sport	Knowledge and practical application	theoretical and practical	Tests & Reports
9	2	Basic skills of tennis and its international law	Knowledge and practical application	theoretical and practical	Tests & Reports
10	2	Basic skills of handball	Knowledge and practical application	theoretical and practical	Tests & Reports
11	2	International Handball Law	Knowledge and practical application	theoretical and practical	Tests & Reports
12	2	Arena and field games (types, international law of the game)	Knowledge and practical	theoretical and practical	Tests & Reports

			application		
13	2	Basic Football Skills	Knowledge and practical application	theoretical and practical	Tests & Reports
14	2	Management of sports competitions and competitions	Knowledge and practical application	theoretical and practical	Tests & Reports
15	2	Sports Laws and Legislations	Knowledge and practical application	theoretical and practical	Tests & Reports

12.Infrastructure	
Required reading:	Available in the free department and library of the institute
Main references (sources)	Available in the free department and library of the institute
Electronic references, Internet sites.	Internet

13.Course development plan
1- Developing curricula adapted to the labor market 2- Holding seminars and scientific conferences aimed at updating the curricula 3- Follow-up scientific developments in the field of specialization

1. Educational institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. Academic department/center	Mosul Technical Institute/ Electronic and Communications Techniques
3. Course name/code	DC circuits
4. Available forms of attendance	theoretical + Practical
5. Semester/year	courses
6. Number of study hours (total)	4 hours / week x decision =60 hours (theoretical And my work)
7. Date this description was prepared	1 – 9 - 2025
1. Course objectives	
• Apply Ohm's law and find the voltage, current and power in an electrical circuit. • How to calculate the equivalent resistance in series, parallel and mixed connections • Converting the connection from star to triangular and vice versa and finding the equivalent resistance. • Kirchhoff's law and how to analyze the circuit using Kirchhoff's law • How to solve using the mesh method which depends on Kirchhoff's voltage law. • Analyse complex electrical circuits using some theories such as Thevenin and Norton's theorem and the cumulative theory. • How to convert the voltage and current source from one to the other to facilitate solving the circuit and finding the current or voltage in any resistance in the electrical circuit. • The theory of maximum possible power transfer and how to derive it and find it in the electrical circuit.	

11.structure The decision / Level the first					
The week	**Hours**	**Required learning outcomes**	**Unit name/topic**	**Teaching method**	**Evaluation method**
the first	2				
the second	2	Knowing the units of the international system and the special components in the electrical circuit. Finding the voltage, current and power in a simple electrical circuit.	Electrical Quantities and Units Multiple and Submultiple of the Internal System Units (SI): Electrical Circuit Components Ohm's law Electrical Power Resistor Power Absorption	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Exams Daily Short Duties Home, Exams Quarterly And final
the third	2	Applying the special law to find the resistance based on the length, area and specific resistance of the material, and finding the resistance value before or after being exposed to a temperature change based on the thermal coefficient of the material.	Resistance and Resistivity Resistor temperature coefficient	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Exams Daily Short Duties Home, Exams Quarterly And final
Fourth	2	Applying the special laws for both series and parallel circuit connection, finding the voltage for each resistor in series connection using a voltage divider, and finding the current for each resistor in parallel connection using a current divider.	• Series Circuit • Voltage divider's law • Parallel circuit • Current divider's law	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Exams Daily Short Duties Home, Exams Quarterly And final
Fifth	2	Finding the equivalent resistance and both voltage and current for each resistor in a series-parallel connection in an electrical circuit	• Series-Parallel combination • examples		
Sixth And the	4	Converting delta to star and vice versa, finding	Wye-delta	=	=

seventh		the equivalent resistance and both voltage and current for each resistance in the electrical circuit	transformations Examples Solve various examples of types of connection		
The eighth	2	Apply Kirchhoff's law and find both the voltage and current for each resistance in the electrical circuit	Kirchhoff's law method (Branch current method) Examples		
Ninth	4	Analysis of the electrical circuit that is difficult to solve using Ohm's law and apply and solve the electrical circuit using the Mesh method and find both the voltage and current for each resistance in the electrical circuit.	Mesh method (Maxwell current loop method) Examples	=	=
tenth	2	Apply and solve the electric circuit using the superposition theory and find both the voltage and current for each resistance in the electric circuit.	superposition theorem: Examples	=	=
eleventh	2	Apply and solve the electrical circuit using Thevenin's theorem and find the load current in the electrical circuit.	Thevenin's theorem Examples		
twelfth	2	Apply and solve the electrical circuit using Norton's theorem and find the load resistance current in the electrical circuit	Norton's Theorem Examples		
thirteenth	2	Apply and solve the electrical circuit using source conversion..	Source transformation Example		
fourteenth	2	Apply and solve the	Maximum power	Theoretical	Exams Daily

		electrical circuit and find the maximum power transfer.	transfer theorem Example	lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Short Duties Home, Exams Quarterly And final
fifteenth	2	Solve examples	Solve examples of all theories		

.	1- Books The reporter Required
1- Charles K. Alexander, Mathew NO Sadiku "Fundamental of electric circuit",3rd.	2- the reviewer Home (Sources)
	A Books References that Recommended With it (Magazines Scientific , reports ,....)
Technical Institute website / Mosul	for - the reviewer Electronic, Sites The Internet ....

13.Curriculum Development Plan
1- Curriculum Development 2- Laboratories Development 3- Continuing Education Courses 4- Showing Scientific Films 5- Holding Scientific Visits 6- Organizing Study Groups

1. Educational institution	the university Technology Northern
2. Academic department/center	Mosul Technical Institute/ Electronic and Communications Techniques
3. Course name/code	Basic of Digital circuits
4. Available forms of attendance	theoretical + Practical
5. Semester/year	courses
6. Number of study hours (total)	4 hours / week x decision =60 hours (theoretical And my work)
7. Date this description was prepared	1 – 9 - 2025

8. Course Objectives

- To introduce the basic principles of digital circuits and how they work.
- Develop the ability to design and analyze logical circuits.
- Theories and applications of digital logic, logic gates, counters, comparators, and numerical systems
- Identify the applications of digital circuits in electronic devices and communication systems.
- Use the tools and techniques necessary to design and test digital circuits.

9. Course outcomes, teaching, learning and assessment methods

B - Course specific cognitive objectives.

A1-Understanding the basic principles of digital circuits and numerical systems.

A2-Identifying logic gates* and how to use them in building circuits.

A3-Analyzing and designing logic circuits using specific tools and techniques for digital circuits in various electronic devices and communication systems.

B - Course specific skill objectives.

B1- Perform various operations on numerical systems.

B2- Design and implement various logical circuits.

B3- Simplify and analyze logical circuits.

B4- Implement practical applications of logical circuits.

Teaching and learning methods

- Theoretical lectures
- Scientific discussion in classrooms
- Small group method
- Conducting practical experiments in laboratories
- Study seminars and presentation of the latest scientific developments globally by students
- Scientific films and other means of clarification
- Methodological training
- Summer training

Methods Evaluation

- Evaluation Methods
- Oral and written tests
- Semester and final exams
- Practical reports
- Homework
- Daily assessment

C- Emotional and value-based objectives

C1- Developing students' sense of scientific curiosity towards digital circuits and their technologies.

C2- Encouraging teamwork and cooperation between students in projects and practical applications.

C3- Stimulating innovation and creativity in the design and analysis of digital circuits.

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

D1 Design and analyze logic circuits* accurately.

D2 Use the software tools* necessary to design and test circuits.

D3- Understand the practical applications* of digital circuits in modern devices and systems.

D4- Develop logical thinking and problem solving* by dealing with the challenges of circuit design

11.structure The decision / Level the first

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
the first	2	Knowledge and Practical Application	مقدمة عن المقرر، أهداف التعلم، محتوى المقرر	Theoretical lectures and scientific	Exams Daily Short Duties Home, Exams

				discussion Showing scientific films, the latest developments and means of clarification	Quarterly And final
the second	2	Knowledge and Practical Application	**Number Systems** • Decimal System • Binary System • Octal System • Hexadecimal System	=	=
the third	2	Knowledge and Practical Application	**Conversions Between Number Systems.** • Conversion from Decimal to Other Systems and vice versa. • Conversion from Binary to Hexadecimal and vice versa. • Conversion of Fractional Numbers.	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Exams Daily Short Duties Home, Exams Quarterly And final
Fourth	2	Knowledge and Practical Application	Arithmetic Operations in Binary and Hexadecimal Systems • Addition, Subtraction, Multiplication, and Division in the Binary System. • Addition and Subtraction in the Hexadecimal System	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Exams Daily Short Duties Home, Exams Quarterly And final
Fifth	2	Knowledge and Practical Application	• Complements in the Binary System (One's Complement and Two's Complement) • Subtraction Using Complements	=	=
Sixth	2	Knowledge and Practical Application	**Basic Logic Gates** • **AND Gate**: Circuit diagram, gate symbol, truth table, and timing diagram for the gate. • **OR Gate**: Circuit diagram, gate symbol, truth table, and timing diagram for the gate. • **NOT Gate**: Circuit	=	=

			diagram, gate symbol, truth table, and timing diagram for the gate.		
Seventh	2	Knowledge and Practical Application	**Composite Gates** • **NAND Gate**: Gate symbol, truth table, and timing diagram for the gate. • **NOR Gate**: Gate symbol, truth table, and timing diagram for the gate. • **XOR Gate**: Gate symbol, truth table, and timing diagram for the gate. • **XNOR Gate**: Gate symbol, truth table, and timing diagram for the gate.	=	=
The eighth	2	Knowledge and Practical Application	**Gate Transformation Using Inverters** • Effect of Inverting Gate Inputs • Effect of Inverting Gate Outputs • Effect of Inverting Both Inputs and Outputs of Gates.	=	=
Ninth	2	Knowledge and Practical Application	**Aggregation of Logic Gates** • Aggregation of Gates Using AND-OR Logic • Aggregation of Logic Gates Using NAND Logic	=	=
tenth	2	Knowledge and Practical Application	De Morgan's Theorems • First De Morgan's Theorem • Second De Morgan's Theorem	=	=
eleventh	2	Knowledge and Practical Application	**Boolean Algebra Relations** • OR Relations • AND Relations	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Exams Daily Short Duties Home, Exams Quarterly And final
twelfth	2	Knowledge and Practical Application	Boolean Algebra Laws • Commutative Laws	=	=

			• Associative Laws • Distributive Laws		
thirteenth	2	Knowledge and Practical Application	Boolean Expressions for Logic Circuits •Representation of a Logic Circuit Using Boolean Expression •Representation of a Logic Circuit Through a Truth Table •Conversion of Boolean Expression to Truth Table	=	=
fourteenth	2	Knowledge and Practical Application	Simplification of Logical Equations Using Boolean Algebra Laws and Rules • Reduction in the Number of Gates Used in the Design	=	=
fifteenth	2	Knowledge and Practical Application	Solving Questions and General Review		

7 Structure Infrastructure	
	1- Books The reporter Required
	2- the reviewer Home (Sources)
1- Logic Circuits and Microprocessors - Communications Specialization. **Technical and Vocational Training Corporation - Saudi Arabia** **2-Digital Fundamentals, Thomas L.Floyd, Eleventh Edition.** **3-Digital Design, M.Morris Mano,**Prentice-Hall, 5th, 2013. **4- Digital Technology, Misty E. Vemaat, Discovering Computers 2018.** **5- Computing Essentials,**Timothy J. O'Leary, McGraw-Hill Education, **2017.**	A Books References that Recommended With it (Magazines Scientific , reports ,....)
Technical Institute website / Mosul	for - the reviewer Electronic, Sites The Internet ....

13.Plan Curriculum Development

1- Curriculum Development
2- Laboratories Development
3- Continuing Education Courses
4- Showing Scientific Films
5- Holding Scientific Visits
6- Organizing Study Groups

1. Educational institution	the university Technology Northern
2. Academic department/center	Mosul Technical Institute/ Electronic and Communications Techniques

3. Course name/code	Digital circuits
4. Available forms of attendance	theoretical + Practical
5. Semester/year	courses
6. Number of study hours (total)	4 hours / week x decision =60 hours (theoretical And my work)
7. Date this description was prepared	1 – 9 - 2025

8. Course Objectives

- • Introduce and teach students how to build logic and digital circuits and utilize them in their field.
• Link theoretical knowledge to practical applications.
• Develop students' scientific thinking and research skills.

9. Course outcomes, teaching, learning and assessment methods

Learning and teaching methods: Discussion, lecture, problem-solving, practical.
Assessment methods: Oral tests, written tests, weekly reports, daily attendance, and midterm and final exams.

B - Course specific cognitive objectives.

The course aims to provide students with a comprehensive understanding of the design of various digital circuits, both combinational and sequential. It also aims to develop their skills in analyzing and designing digital circuits using various tools and techniques, as well as linking these concepts to practical applications in computing and electronics.

• Digital Circuit Analysis:
Students learn how to analyze complex digital circuits, identify their functions, and represent them using Boolean algebra.
• Combinational Circuit Design:
Students learn how to design combinational circuits (such as comparators, binary adders and subtractors, etc.) using logic gates.
• Sequential Circuit Design:
Students learn how to design sequential circuits (such as counters, registers, etc.) that rely on the previous state of the circuit.
• Linking Theoretical and Practical Concepts:
The course seeks to clarify the relationship between the theoretical concepts of digital circuits and their practical applications in electronic devices and computers.

B - Course specific skill objectives.

• Problem Solving: The student must be able to solve problems related to logic circuit design and apply logic circuit concepts effectively.
• Collaboration and Communication: The student must be able to work within a team and collaborate with others in designing digital circuits.
• Critical Thinking: The student must be able to evaluate different logic circuit designs and select the optimal design based on specific criteria.

C- Emotional and value-based objectives

• Developing students' respect for science and technology: Instilling in students a sense of value and respect for the efforts expended in circuit design and logical analysis, and encouraging them to appreciate the importance of digital engineering in society.
• Developing a sense of responsibility: Motivating students to take responsibility for their learning, and encouraging them to adhere to deadlines and maintain quality in academic and practical work.
• Enhancing self-confidence: Helping students build confidence in their ability to understand and design complex circuits and their applications, which increases their motivation and ongoing motivation.
• Connecting to the profession and innovation: Convincing students of the value of a professional field in digital engineering, and motivating them to be creative and proactive in circuit design.

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

• Problem-solving skills:

Use logical thinking and systematic analysis to address challenges in circuit design.

• Teamwork and communication skills:

Collaborate with colleagues on design and testing projects.

Exchange knowledge and ideas effectively.

• Professional and ethical skills:

Adhere to quality and safety standards when designing and using circuits.

Delivery of sustainable, performance- and cost-effective solutions.

• Flexibility and adaptability:

Ability to keep pace with technological developments in the field of digital circuits.

Continuous learning and self-development.

11.structure The decision / Level the first

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
the first	2	Knowledge and Practical Application	Introduction to the course, learning objectives, course content	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Exams Daily Short Duties Home, Exams Quarterly And final
the second	2	Knowledge and Practical Application	•Universal Gates (NAND & NOR)	=	=
the third	2	Knowledge and Practical Application	•Designing logic circuits using universal gates Deriving the logical • equation from the truth table using SOP (Sum of Products) method. Deriving the logical • equation from the truth table using POS (Product of Sums) method.	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Exams Daily Short Duties Home, Exams Quarterly And final
Fourth	2	Knowledge and Practical Application	Karnaugh Map (K-map)	Theoretical lectures and scientific discussion Showing scientific	Exams Daily Short Duties Home, Exams Quarterly And final

				films, the latest developments and means of clarification	
Fifth	2	Knowledge and Practical Application	Simplifying Logical Equations Using Karnaugh Map	=	=
Sixth	2	Knowledge and Practical Application	Digital Arithmetic Circuits (Binary Adder Circuits) •Half Adder Circuit, Full Adder Circuit, Parallel Adder Circuit.	=	=
Seventh	2	Knowledge and Practical Application	Digital Arithmetic Circuits (Binary Subtractor Circuits) Half • Subtractor Circuit, Full Subtractor Circuit, Parallel Subtractor Circuit.	=	=
The eighth	2	Knowledge and Practical Application	Digital Comparator Circuit. •Single-bit comparator circuit, Two-bit comparator circuit.	=	=
Ninth	2	Knowledge and Practical Application	Decoder Circuit	=	=
tenth	2	Knowledge and Practical Application	Decoder Circuit	=	=
eleventh	2	Knowledge and Practical Application	Encoder Circuit	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	Exams Daily Short Duties Home, Exams Quarterly And final
twelfth	2	Knowledge and Practical Application	Designing Sequential Logic Circuits. Flip-Flops, S-R Flip-Flop (Synchronous and Asynchronous)	=	=

thirteenth	2	Knowledge and Practical Application	J-K Flip-Flop	=	=
fourteenth	2	Knowledge and Practical Application	Applications of Sequential Logic Circuits. Shift Registers	=	=
fifteenth	2	Knowledge and Practical Application	Applications of Sequential Logic Circuits Asynchronous Counters, Synchronous Counters.		

8 Structure Infrastructure	
1- Books The reporter Required	
2- the reviewer Home (Sources)	
A Books References that Recommended With it (Magazines Scientific , reports ,....)	
for - the reviewer Electronic, Sites The Internet	

13.Plan Curriculum Development

1- Reviewing educational objectives: Ensure that the objectives align with labor market requirements and community needs.
2- Adding practical elements: Increasing the number of practical activities, applied projects, and simulations.
3- Training workshops: To develop teaching skills using technology.
4- Participating in conferences: Keeping abreast of the latest developments in digital circuit design.
5- Periodic course evaluation: Through student surveys and performance reports.

1. Educational institution	the university Technology Northern
2. Academic department/center	Mosul Technical Institute/ Electronic and Communications Techniques
3. Course name/code	AC circuits
4. Available forms of attendance	theoretical + Practical
5. Semester/year	courses
6. Number of study hours (total)	4 hours / week x decision =60 hours (theoretical And my work)
7. Date this description was prepared	1 – 9 - 2025
• Course objectives	

• The student should be able to find the frequency, period and wavelength of an AC sine wave.
• The student should be able to find the average voltage and square root of an AC sine wave.
• The student should learn how to calculate the impedance of capacitor, inductor and resistance in AC circuits.
• The student should be able to calculate the voltage, current and phase difference of capacitor, inductor and resistance in pure AC circuits.
• The student should learn how to calculate the voltage, current and phase difference of capacitor, inductor and resistance in series AC circuits.
• The student should learn how to calculate the voltage, current and phase difference of capacitor, inductor and resistance in parallel AC circuits.
• The student should be able to find the resonant frequency, quality factor and bandwidth difference in series and parallel.
• The student should be able to apply Thevenin and Norton theorems to AC circuits.

8 Course Outcomes, Teaching, Learning and Evaluation Method

A- Cognitive Objectives
A1- The student will learn the basics of alternating current and its related components such as inductors and capacitors.
A2- Enabling students to analyze alternating current circuits using mathematical tools and modern techniques.
A3- Understanding the practical applications of alternating current in various devices and systems.
A4- Studying electrical theories related to alternating current such as Kirchhoff's laws..

B - Course specific skill objectives.
B1- The student should have the ability to think and solve problems and electrical circuits.
B2- The student should have the ability to analyze and think scientifically by applying laws.
B3- The ability to conduct scientific investigations related to aspects of electrical circuits -

Teaching and learning methods

1- Theoretical lectures
-2 Scientific discussion in classrooms
-3 Small group method
-4 Conducting practical experiments in laboratories
-5 Study seminars and presentation of the latest scientific developments globally by students
6- Scientific films and other means of clarification
7- Methodological training
8- Summer training

Evaluation Methods

- Oral and written tests
- Midterm and final exams
- Practical reports
- Homework
- Daily assessment

C- Emotional and value-based objectives
C1- Motivating students to be interested in studying alternating current and understanding its importance in daily life applications.
C2- Building confidence in the ability to understand, analyze and apply the concepts of alternating current.
C3- Instilling values of accuracy and commitment in working on alternating current circuits, whether in design or analysis.
C4- Enhancing the ability to work in teams and exchange ideas about designing and analyzing circuits.

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

D1- Gaining the experience that qualifies them to deal with the necessities of life, including experience in the field of connecting alternating electrical circuits.

D2- Gaining the experience that qualifies them to deal with electrical circuits and their components, voltage sources and electrical measuring devices.

D3- Gaining experience in reverse engineering electronic maps

10. structure The decision / Level the first

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
the first	2	-	Course introduction, learning objectives, course content	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**
the second	2	Finding the frequency and wavelength of the sine function and the constants of the form constant and the maximum constant	Sinewave function, frequency period, wavelength, angular measurement characteristic value of the voltage and current of sinewave form factor, peak factor	=	=
the third	2	Finding the phase difference, lead and delay between sinusoidal signals	Phase angle, lead and leg, phasor diagram examples	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**
Fourth	2	Finding the impedance, voltage and current for pure resistive, capacitive and inductive circuits	Purely resistive circuit Purely inductive circuit Purely capacitive circuit	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**

Fifth	2	Find the impedance, voltage and current for each of the RL-RC series circuits.	RL series circuits RC series circuits Examples	=	=
Sixth	2	Finding the impedance, voltage and current for each of the RLC series circuits	RLC series circuits examples	=	=
Seventh	2	Finding the impedance, voltage and current for each of the RL – RC parallel circuits	RL parallel circuits RC parallel circuits Example	=	=
The eighth	2	Finding the impedance, voltage and current for each of the RLC parallel circuits	RLC parallel circuits Examples		
Ninth	2		RLC parallel-series circuits Examples		
tenth	2	Finding the series resonant frequency and the specificity constant	Resonance series and Quality factor		
eleventh	2		Resonance Parallel circuits Examples	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**
twelfth	2		Solving various examples of series and parallel resonant circuits	=	=
thirteenth	2	Knowing the power triangle and the relationship between them and how to apply its laws	Power consumed, power factor, power triangular	=	=
fourteenth	2		Examples about power	=	=

			triangular		
fifteenth	2	Application of theories in AC circuits	Thevenin's theorem and Norton theorem in AC circuits		

9 Structure Infrastructure	
1- Books The reporter Required	
2- the reviewer Home (Sources)	
A Books References that Recommended With it (Magazines Scientific , reports ,....)	1- Charles K. Alexander, Mathew NO Sadiku "Fundamental of electric circuit",3rd. 2- Road M. Rasheed, “Lectures electric circuits”, Part2.
for - the reviewer Electronic, Sites The Internet	Technical Institute website / Mosul

13.plan development The decision Academic
1- development Curricula 2- development Laboratories 3- Courses education continuous 4- an offer films Scientific 5- stay Visits Scientific 6- to organize Episodes Academic

1. Educational institution	the university Technology Northern
2. Academic department/center	Mosul Technical Institute/ Electronic and Communications Techniques
3. Course name/code	AC circuits
4. Available forms of attendance	theoretical + Practical
5. Semester/year	courses
6. Number of study hours (total)	4 hours / week x decision =60 hours (theoretical And my work)
7. Date this description was prepared	1 – 9 - 2025
• Course objectives	

• The student should be able to find the frequency, period and wavelength of an AC sine wave.
• The student should be able to find the average voltage and square root of an AC sine wave.
• The student should learn how to calculate the impedance of capacitor, inductor and resistance in AC circuits.
• The student should be able to calculate the voltage, current and phase difference of capacitor, inductor and resistance in pure AC circuits.
• The student should learn how to calculate the voltage, current and phase difference of capacitor, inductor and resistance in series AC circuits.
• The student should learn how to calculate the voltage, current and phase difference of capacitor, inductor and resistance in parallel AC circuits.
• The student should be able to find the resonant frequency, quality factor and bandwidth difference in series and parallel.
• The student should be able to apply Thevenin and Norton theorems to AC circuits.

8 Course Outcomes, Teaching, Learning and Evaluation Method

A- Cognitive Objectives
A1- The student will learn the basics of alternating current and its related components such as inductors and capacitors.
A2- Enabling students to analyze alternating current circuits using mathematical tools and modern techniques.
A3- Understanding the practical applications of alternating current in various devices and systems.
A4- Studying electrical theories related to alternating current such as Kirchhoff's laws..

B - Course specific skill objectives.
B1- The student should have the ability to think and solve problems and electrical circuits.
B2- The student should have the ability to analyze and think scientifically by applying laws.
B3- The ability to conduct scientific investigations related to aspects of electrical circuits -

Teaching and learning methods

1- Theoretical lectures
-2 Scientific discussion in classrooms
-3 Small group method
-4 Conducting practical experiments in laboratories
-5 Study seminars and presentation of the latest scientific developments globally by students
6- Scientific films and other means of clarification
7- Methodological training
8- Summer training

Evaluation Methods

- Oral and written tests
- Midterm and final exams
- Practical reports
- Homework
- Daily assessment

C- Emotional and value-based objectives
C1- Motivating students to be interested in studying alternating current and understanding its importance in daily life applications.
C2- Building confidence in the ability to understand, analyze and apply the concepts of alternating current.
C3- Instilling values of accuracy and commitment in working on alternating current circuits, whether in design or analysis.
C4- Enhancing the ability to work in teams and exchange ideas about designing and analyzing circuits.

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

D1- Gaining the experience that qualifies them to deal with the necessities of life, including experience in the field of connecting alternating electrical circuits.

D2- Gaining the experience that qualifies them to deal with electrical circuits and their components, voltage sources and electrical measuring devices.

D3- Gaining experience in reverse engineering electronic maps

11. structure The decision / Level the first

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
the first	2	-	Course introduction, learning objectives, course content	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**
the second	2	Finding the frequency and wavelength of the sine function and the constants of the form constant and the maximum constant	Sinewave function, frequency period, wavelength, angular measurement characteristic value of the voltage and current of sinewave form factor, peak factor	=	=
the third	2	Finding the phase difference, lead and delay between sinusoidal signals	Phase angle, lead and leg, phasor diagram examples	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**
Fourth	2	Finding the impedance, voltage and current for pure resistive, capacitive and inductive circuits	Purely resistive circuit Purely inductive circuit Purely capacitive circuit	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**

Fifth	2	Find the impedance, voltage and current for each of the RL-RC series circuits.	RL series circuits RC series circuits Examples	=	=
Sixth	2	Finding the impedance, voltage and current for each of the RLC series circuits	RLC series circuits examples	=	=
Seventh	2	Finding the impedance, voltage and current for each of the RL – RC parallel circuits	RL parallel circuits RC parallel circuits Example	=	=
The eighth	2	Finding the impedance, voltage and current for each of the RLC parallel circuits	RLC parallel circuits Examples		
Ninth	2		RLC parallel-series circuits Examples		
tenth	2	Finding the series resonant frequency and the specificity constant	Resonance series and Quality factor		
eleventh	2		Resonance Parallel circuits Examples	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**
twelfth	2		Solving various examples of series and parallel resonant circuits	=	=
thirteenth	2	Knowing the power triangle and the relationship between them and how to apply its laws	Power consumed, power factor, power triangular	=	=
fourteenth	2		Examples about power	=	=

			triangular		
fifteenth	2	Application of theories in AC circuits	Thevenin's theorem and Norton theorem in AC circuits		

10 Structure Infrastructure	
1- Books The reporter Required	
2- the reviewer Home (Sources)	
A Books References that Recommended With it (Magazines Scientific , reports ,....)	3- Charles K. Alexander, Mathew NO Sadiku "Fundamental of electric circuit",3rd. 4- Road M. Rasheed, “Lectures electric circuits”, Part2.
for - the reviewer Electronic, Sites The Internet	Technical Institute website / Mosul

13.plan development The decision Academic

7- development Curricula
8- development Laboratories
9- Courses education continuous
10- an offer films Scientific
11- stay Visits Scientific
12- to organize Episodes Academic

1. Educational institution	Northern Technical University
2. Academic department/center	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course name/code	Computer Programming
4. Available forms of attendance	First-stage students
5. Semester/year	First semester / 2026 AD
6. Number of study hours (total)	Two hours per week for 15 weeks (course)
7. Date this description was prepared	1 – 9 - 2025

• 8. Course objectives

-:1 Identify the programs used to write codes in C++
-:2 Identify the basics of C++
-:3 How to write conditional statements and the types of commands to execute them
-:4 Identify recursive operations and the most important commands used in repetition
-:5 Identify single commands in C++

9. Course Outcomes and Teaching and Learning Methods

Learning and Teaching Method: Discussion Method, Lecture Method
Evaluation Method: Daily Exams, Term Exams, Final Exam

A- Cognitive objectives A1- Knowing the basics and how to call variables and the type of data that is entered A2- Knowing how to use conditional statements and applying their special programs A3- Identifying the libraries used and the purpose of calling them D A4- Identifying how to implement logical and mathematical operations**.**
B- Course specific skill objectives B1- The ability to identify, formulate and solve technical problems. B2 - The ability to write programming code and know how to deal with programming errors. B-3 The ability to apply knowledge in science and engineering
C- Emotional and value-based objectives C1- Developing, activating and organizing thinking C2- Working to make the student's imagination fertile by highlighting the beauty of the language and thus enabling him to express the inner self in a sound manner.
D- General and transferable qualification skills (other skills related to employability and personal development). D-1 Enabling students to conduct job interviews and demonstrate the required engineer personality in the workplace D-2 Enabling students to make the right decision as quickly as possible to manage work matters in the workplace D-3 Enabling students to pass professional tests organized by local/regional/international bodies D-4 Enabling students to develop themselves continuously after graduation to keep pace with the development taking place in the field of specialization

12.structure The decision / Level the first					
The week	**Hours**	**Required learning outcomes**	**Unit name/topic**	**Teaching method**	**Evaluation method**
First	2 hours		Introduction to the course, learning objectives, course content	Discussion method, lecture method	Daily Oral Test
Second	2 hours	Learn the difference between programming and a program and the types and levels of programming	•A simple definition of programming and the program •Types of programs •Programming levels •Programming language levels	Discussion method, lecture method	Daily Oral Test
Third	2 hours	Know the features, form and environmental interface of the C++ program	•A simple definition of the C++ language •Features of the C++ language •The general form of writing a program •The environmental interface of the C++ language program	Discussion method, lecture method	Daily Oral Test
Fourth	2 hours	Know the basics of the C++ language	3. Basics of the C++ language 1- Letters 2- Special symbols 3- Reserved words 4- Variables 5- Constants 6- Uses of the slash	Discussion method, lecture method	Daily Oral Test
Fifth	2 hours	Know how to enter and output the value, and represent arithmetic values in the C++ language	•Input and output instructions	Discussion method, lecture method	Daily Oral Test
Sixth	2 hours	Know how to represent the comparison process and logical operations in the C++ language	Simple arithmetic operations in the C++ language Representing comparison and logical operations in the C++ language	Discussion method, lecture method	Daily Oral Test

Seventh	2 hours	Know how to represent mathematical function instructions in the C++ language	Instructions of mathematical functions in the C++ language	Discussion method, lecture method	Daily Oral Test
Eighth	2 hours	Know how to represent conditional statements in the C++ language	Conditional statements (IF……else)	Discussion method, lecture method	Daily Oral Test
Ninth	2 hours	Know how to represent nested conditional statements in the C++ language	Nested conditional statements (IF……else…..else)	Discussion method, lecture method	Daily Oral Test
Tenth	2 hours		Solving examples of writing various programs about arithmetic	Discussion method, lecture method	Daily Oral Test
Eleventh	2 hours	Know how to represent nested rotation statement in the C++ language	Loop statement •For •Do … while	Discussion method, lecture method	Daily Oral Test
Twelfth	2 hours	Know how to represent a single matrix in the C++ language and how to deal with it	The concept of an array in C++	Discussion method, lecture method	Daily Oral Test
Thirteenth	2 hours	Know how to represent a binary matrix in the C++ language and how to deal with it	How to access the elements of a single array in C++ with solutions to examples of writing programs	Discussion method, lecture method	Daily Oral Test
Fourteenth	2 hours	Know how to represent a function in the C++ language and how to formulate it and how to call it	How to deal with the elements of a binary array in C++ with solutions to examples of writing programs	Discussion method, lecture method	Daily Oral Test
Fifteenth	2 hours		Writing a function and how to define it, formulate it, and methods of calling it	Discussion method, lecture method	Daily Oral Test

12. Infrastructure	
1- Required textbooks	
2- Main references (sources)	
A- Recommended books and references (scientific journals, reports, ...)	
B- Electronic references, Internet sites	

13. Curriculum Development Plan
1. Curriculum Development 2. Laboratory Development 3. Continuing Education Courses 4. Showing Scientific Films 5. Holding Scientific Visits 6. Organizing Study Groups

1. Educational institution	Northern Technical University
2. Academic department/center	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course name/code	Electronic physics
4. Available forms of attendance	First-stage students
5. Semester/year	First semester / 2026 AD
6. Number of study hours (total)	Two hours per week for 15 weeks (course)
7. Date this description was prepared	1 – 9 - 2025

• 8. Course objectives

Understand the energy level and atomic structure through the energy band theory of materials.

- Basic concept and internal structure of materials such as metals, insulators and semiconductors.
- Understand electrical conductivity and properties of all materials such as conductivity, mobility, and energy distribution of electrons.
- Understand the work of diode, its properties and applications.
- Identify the types of rectifiers and their work.
- Identify filters and their work.
- Identify Zener diode and its applications

9. Course Outcomes and Teaching and Learning Methods

Learning and Teaching Method: Discussion Method, Lecture Method

Evaluation Method: Daily Exams, Term Exams, Final Exam

A- Cognitive objectives

A1- Enable students to understand the principles and theoretical foundations of electronics and communications.
A2- Develop analysis and design skills for complex communication and electronics systems.
A3- Identify the latest technologies and innovations in the field of electronics and communications.
A4- Apply the acquired theories to real projects and industrial problems.
A5- Enhance research and development skills to provide new and effective solutions in the field of electronics and communications.

B- Course specific skill objectives

B1- Stimulating curiosity and interest in the field and understanding its importance in daily life and technological - development.
B2- Building students' confidence in their ability to understand, analyze and solve complex problems. -
B3- Instilling the values of accuracy, perseverance in work and creativity in solving problems. -
B4- Encouraging students to work in a team spirit and cooperate with others to achieve common goals. -

C- Emotional and value-based objectives

C1- Enhancing appreciation for the field of electronic and communications technologies and their role in developing technology and society.
C2- Instilling values of commitment and discipline in academic work and research projects.
C3- Encouraging teamwork, team spirit and cooperation among students and colleagues.
C4- Enhancing understanding of professional ethics and the importance of integrity and transparency in research and development.

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

D1- The ability to analyze electronic circuits and communications systems and understand their behavior.
D2- Design electronic systems and develop innovative solutions to communication problems.
D3- Use specialized tools and software in the field of electronics and communications to conduct experiments and develop applications.
D4- Conduct scientific research and laboratory experiments to provide solutions and develop new theories.

12.structure The decision / Level the first					
The week	**Hours**	**Required learning outcomes**	**Unit name/topic**	**Teaching method**	**Evaluation method**
First	2 hours		Introduction to the course, learning objectives, course content	Discussion method, lecture method	Daily Oral Test
Second	2 hours		Semiconductor theory- Structure of the atom- Energy levels- Crystals Conductivity in crystals- Current gap- How the gap moves	Discussion method, lecture method	Daily Oral Test
Third	2 hours		Doping_ P-type positive crystal- N-type positive crystal- Current of electrons and current of gaps- Total resistance	Discussion method, lecture method	Daily Oral Test
Fourth	2 hours		Semiconductor diodes- Formation of the evacuation region- Barrier voltage- Energy hill- Thermal effects- Biased diode- Forward bias- Reverse bias- Characteristic curves in the forward and reverse directions- Evanescent crossing current- Minority carrier current- Permissive leakage current- Breakdown voltage- Breakdown voltage- Maximum forward current- Maximum reverse current- Equivalent circuit of the diode	Discussion method, lecture method	Daily Oral Test
Fifth	2 hours		Diode as a current rectifier- Half-wave rectifier- Value- Continuous value of current and its calculation- Effective- Output frequency	Discussion method, lecture method	Daily Oral Test
Sixth	2 hours		Full-wave rectifier- Using a middle-branch transformer- Bridge rectifier- Calculating continuous and effective values of voltages and currents- Output frequency- Comparison between half-wave and full-wave rectifier- Comparison between Full wave rectifiers	Discussion method, lecture method	Daily Oral Test
Seventh	2 hours		Filters - Capacitor filtering - RC - LC filters - Output voltages - Ripple - Voltage multipliers - Trimming circuits - Positive trimming - Negative trimming - Complex trimming - Atom to atom detector - Positive and negative binding posts	Discussion method, lecture method	Daily Oral Test
Eighth	2 hours		Solving various examples of rectifiers and filters	Discussion method, lecture method	Daily Oral Test

Ninth	2 hours		Zener diode - Its structure - Symbol - Forward and reverse properties - Breakdown voltages - Zener impedance - Power tolerance - Temperature effects - Zener approximation	Discussion method, lecture method	Daily Oral Test
Tenth	2 hours		DC voltage regulation - DC voltage source circuit - Variable capacitor diode - and its applications - Light emitting diode - Photodiode - Variable capacitance diode	Discussion method, lecture method	Daily Oral Test
Eleventh	2 hours		Introduction to the course, learning objectives, course content	Discussion method, lecture method	Daily Oral Test
Twelfth	2 hours		Semiconductor theory- Structure of the atom- Energy levels- Crystals Conductivity in crystals- Current gap- How the gap moves	Discussion method, lecture method	Daily Oral Test
Thirteenth	2 hours		Doping_ P-type positive crystal- N-type positive crystal- Current of electrons and current of gaps- Total resistance	Discussion method, lecture method	Daily Oral Test
Fourteenth	2 hours		Semiconductor diodes- Formation of the evacuation region- Barrier voltage- Energy hill- Thermal effects- Biased diode- Forward bias- Reverse bias- Characteristic curves in the forward and reverse directions- Evanescent crossing current- Minority carrier current- Permissive leakage current- Breakdown voltage- Breakdown voltage- Maximum forward current- Maximum reverse current- Equivalent circuit of the diode	Discussion method, lecture method	Daily Oral Test
Fifteenth	2 hours		Diode as a current rectifier- Half-wave rectifier- Value- Continuous value of current and its calculation- Effective- Output frequency	Discussion method, lecture method	Daily Oral Test

12. Infrastructure	
1- Required textbooks	
2- Main references (sources)	
A- Recommended books and references (scientific journals, reports, ...)	
B- Electronic references, Internet sites	

13. Curriculum Development Plan
1. Curriculum Development 2. Laboratory Development 3. Continuing Education Courses

4. Showing Scientific Films
5. Holding Scientific Visits
6. Organizing Study Groups

1. Educational institution	Northern Technical University
2. Academic department/center	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course name/code	Electronic2
4. Available forms of attendance	First-stage students
5. Semester/year	First semester / 2026 AD
6. Number of study hours (total)	Two hours per week for 15 weeks (course)
7. Date this description was prepared	1 – 9 - 2025

• 8. Course objectives

1. Developing the skills of solving electronic circuit problems through all passive and active electronic components, transistors, and integrated circuits.
2. Understanding the basic structure of the transistor through graphical analysis of transistors and their biasing.
3. To understand the analysis of the load line, the transistor at the operating point, and the classification amplification.
4. Understanding the H coefficients.
5. Identifying the types of bias EFT and the equivalent circuit and its use

9. Course Outcomes and Teaching and Learning Methods

Learning and Teaching Method: Discussion Method, Lecture Method
Evaluation Method: Daily Exams, Term Exams, Final Exam

A- Cognitive objectives

A1- Enable students to understand the principles and theoretical foundations of electronics and communications.
A2- Develop analysis and design skills for complex communication and electronics systems.
A3- Identify the latest technologies and innovations in the field of electronics and communications.
A4- Apply the acquired theories to real projects and industrial problems.
A5- Enhance research and development skills to provide new and effective solutions in the field of electronics and communications.

B- Course specific skill objectives

- B1- Arouse curiosity and interest in the field and understand its importance in daily life and technological development.
- B2- Build students' confidence in their ability to understand, analyze and solve complex problems.
- B3- Instill the values of accuracy and perseverance in work and creativity in solving problems.
- B4- Encourage students to work in a team spirit and cooperate with others to achieve common goals.

C- Emotional and value-based objectives

C- EC1- Enhance appreciation for the field of electronic and communications technologies and their role in developing technology and society.
C2- Instilling the values of commitment and discipline in academic work and research projects.
C3- Encouraging teamwork, team spirit and cooperation among students and colleagues.
C4- Enhancing understanding of professional ethics and the importance of integrity and transparency in research and development.

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

D1- The ability to analyze electronic circuits and communication systems and understand their behavior.

D2- Design electronic systems and develop innovative solutions to communication problems.

D3- Using specialized tools and software in the field of electronics and communications to conduct experiments and develop applications.

D4- Conducting scientific research and laboratory experiments to provide solutions and develop new theories.

12.structure The decision / Level the first					
The week	**Hours**	**Required learning outcomes**	**Unit name/topic**	**Teaching method**	**Evaluation method**
First	2 hours		Introduction to the course, learning objectives, course content	Discussion method, lecture method	Daily Oral Test
Second Third	2 hours		Bipolar transistor - structure - symbol - regions - definition (βdc) - definition) (□dc - relationship between them - definition of important regions on the characteristic curves - Transistor bias circuits - Emitter bias - Collector bias - Collector bias - Approximation in the transistor and the equivalent circuit	Discussion method, lecture method	Daily Oral Test
	2 hours			Discussion method, lecture method	Daily Oral Test
Fourth	2 hours		Transistor characteristic curves - working regions	Discussion method, lecture method	Daily Oral Test
Fifth	2 hours		Transistor bias circuits - Base bias - Emitter bias	Discussion method, lecture method	Daily Oral Test
Sixth	2 hours		Continuous equivalent circuit of the transistor - Continuous load line	Discussion method, lecture method	Daily Oral Test
Seventh Eighth	2 hours		Use of transistor in small signal amplification - AC equivalent circuit - Current gain - Voltage gain - Ideal approximation - Hybrid constants -	Discussion method, lecture method	Daily Oral Test
	2 hours			Discussion method, lecture method	Daily Oral Test
Ninth	2 hours		Equivalent circuit using h coefficients - Voltage gain - Current gain - Power gain - Input and output resistances - Small signal amplifiers.	Discussion method, lecture method	Daily Oral Test
Tenth	2 hours		Use of transistor in voltage regulation - Series regulator - Parallel regulator - DC voltage source circuit	Discussion method, lecture method	Daily Oral Test
Eleventh Twelfth	2 hours		Field effect transistor structure MOSFET curve - E MOSFET characteristic curve Comparison between JFET, BJT	Discussion method, lecture method	Daily Oral Test
	2 hours			Discussion method, lecture method	Daily Oral Test
Thirteenth	2 hours		Solving various examples of types of transistors	Discussion method, lecture method	Daily Oral Test
Fourteenth	2 hours		Operational amplifier 741 symbol connection terminals and its use	Discussion method, lecture method	Daily Oral Test

Fifteenth	2 hours		FET bias circuits - Equivalent circuit - Its use - Types of FET	Discussion method, lecture method	Daily Oral Test

12. Infrastructure	
1- Required textbooks	
2- Main references (sources)	
A- Recommended books and references (scientific journals, reports, ...)	
B- Electronic references, Internet sites	

13. Curriculum Development Plan

1. Curriculum Development
2. Laboratory Development
3. Continuing Education Courses
4. Showing Scientific Films
5. Holding Scientific Visits
6. Organizing Study Groups

1. Educational institution	Northern Technical University
2. Academic department/center	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course name/code	Engineering drawing
4. Available forms of attendance	First-stage students
5. Semester/year	First semester / 2026 AD
6. Number of study hours (total)	Two hours per week for 15 weeks (course)
7. Date this description was prepared	1 – 9 - 2025

• 8. Course objectives

• Understand basic engineering drawing principles.
• Proficiency in using AutoCAD.
• Produce accurate engineering drawings using a computer.
• Integrate hand drawing with computer-aided drawing.
• Develop documentation and professional skills.
• Prepare for advanced engineering design.

9. Course Outcomes and Teaching and Learning Methods

Learning and Teaching Method: Discussion Method, Lecture Method
Evaluation Method: Daily Exams, Term Exams, Final Exam

A- Cognitive objectives

• Understand the theoretical foundations of AutoCAD
• Gain knowledge of basic AutoCAD commands
• Know international drawing standards

B- Course specific skill objectives

1- Organize graphics using layers.

2- Add dimensions and text accurately.

C- Emotional and value-based objectives

1-Developing, stimulating, and organizing thinking.

2- Working to enrich the student's imagination by providing a deeper insight from various angles.

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

1 -The ability to develop and enhance one's drawing skills

2 -The ability to transform imagination into reality through computer drawing.

12.structure The decision / Level the first					
The week	**Hours**	**Required learning outcomes**	**Unit name/topic**	**Teaching method**	**Evaluation method**
First	3 hours		Introduction to the course, learning objectives, course content	Discussion method, lecture method	Daily Oral Test
Second	3 hours	Canvas Sizes Save the Drawing File Line Command	Learn how to draw a drawing board.	Discussion method, lecture method	Daily Oral Test
Third	3 hours	Draw a Straight Line Draw an Angled Line	Learn to draw using AutoCAD tools.	Discussion method, lecture method	Daily Oral Test
Fourth	3 hours	Rectangle Command Chamfer Command Fillet Command	Enabling students to learn AutoCAD commands.	Discussion method, lecture method	Daily Oral Test
Fifth	3 hours	Drawing Selection Move Command Delete Command Offset	Learn to draw using AutoCAD tools	Discussion method, lecture method	Daily Oral Test
Sixth	3 hours	Command Radius-wise Diameter-wise	Learn to draw circles	Discussion method, lecture method	Daily Oral Test
Seventh	3 hours	Two Points-wise Three Points-wise Two Tangents-wise Rays-wise Three Tangents-wise	Learn to draw circles	Discussion method, lecture method	Daily Oral Test
Eighth	3 hours	Polygon command Rotate command Copy command	Learn to draw a polygon	Discussion method, lecture method	Daily Oral Test
Ninth	3 hours	Arc command Trim command Extend command	Learn to draw an arc	Discussion method, lecture method	Daily Oral Test
Tenth	3 hours	Ellipse command	Learn to draw an oval	Discussion method,	Daily Oral Test

		Mirror command		lecture method	
Eleventh	3 hours	Dimension Command Linear Command Aligned Command Radius	Learn how to display the dimensions of shapes Learn how to draw a matrix	Discussion method, lecture method	Daily Oral Test
Twelfth	3 hours	Command Array Command Rectangle Array Option Polar Array Option	3D drawing	Discussion method, lecture method	Daily Oral Test
Thirteenth	3 hours	Differences Between 2D and 3D Isometric Drawings	Isometric drawings	Discussion method, lecture method	Daily Oral Test
Fourteenth	3 hours	Applications of Isometric Drawings	Projections	Discussion method, lecture method	Daily Oral Test
Fifteenth	3 hours	Basics of Projection Drawing	Learn how to display the dimensions of shapes	Discussion method, lecture method	Daily Oral Test

12. Infrastructure	
Engineering Drawing Book	
Engineering Drawing Using AutoCAD (Mohammed Al-Qadi and Colleagues)	
Internet	

13. Curriculum Development Plan
1. Curriculum Development 2. Laboratory Development 3. Continuing Education Courses 4. Showing Scientific Films 5. Holding Scientific Visits 6. Organizing Study Groups

1. Educational institution	Northern Technical University
2. Academic department/center	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course name/code	electrical drawing

4. Available forms of attendance	First-stage students
5. Semester/year	First semester / 2026 AD
6. Number of study hours (total)	Two hours per week for 15 weeks (course)
7. Date this description was prepared	1 – 9 - 2025

• 8. Course objectives

• Understand basic engineering drawing principles.
• Introduce students to electrical drawing concepts and electrical and electronic symbols.
• Train students to read and interpret electrical drawings.
• Enable students to design various electrical circuit diagrams.
• Use WorkBench design software to draw and document electrical circuits.
• Enhance organizational and planning skills in implementing electrical projects.

9. Course Outcomes and Teaching and Learning Methods

Learning and Teaching Method: Discussion Method, Lecture Method
Evaluation Method: Daily Exams, Term Exams, Final Exam

A- Cognitive objectives

• Know the types of electrical drawings
• Understand electrical symbols
• Understand the basics of the Work Bench program

B- Course specific skill objectives

1- Drawing electrical and electronic circuits using Workbench
2- Organizing elements within the drawing
3- Simulating and running circuits within the program

C- Emotional and value-based objectives

1- Developing, activating, and organizing thinking.
2- Focusing on developing the student's attitudes, behaviors, and professional and educational values while learning the course.
.

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

1- Preparing reports containing circuit analysis and simulation results.
2- Presenting work in an organized and professional manner, with illustrative drawings and logical explanations

10.structure The decision / Level the first					
The week	**Hours**	**Required learning outcomes**	**Unit name/topic**	**Teaching method**	**Evaluation method**
First	3 hours	Familiarizing yourself with the program interface	Introduction to electrical drawing, introduction to Workbench	Discussion method, lecture method	Daily Oral Test
Second	3 hours	Learn electrical symbols	Explaining and drawing electrical symbols	Discussion method, lecture method	Daily Oral Test
Third	3 hours	Learn electronic symbols	Explaining and drawing electronic symbols	Discussion method, lecture method	Daily Oral Test
Fourth	3 hours	Electrical installations	Drawing a panel for electrical installations	Discussion method, lecture method	Daily Oral Test
Fifth	3 hours	Learn electronic circuits	Drawing an electronic wiring board containing a set of electronic circuits	Discussion method, lecture method	Daily Oral Test
Sixth	3 hours	Connecting logic gates	Drawing an electronic circuit board containing logic gates	Discussion method, lecture method	Daily Oral Test
Seventh	3 hours	Three-phase motors	Drawing a panel to control the speed of a three-phase motor	Discussion method, lecture method	Daily Oral Test
Eighth	3 hours	Electrical mapping	Reading an electronic circuit diagram	Discussion method, lecture method	Daily Oral Test
Ninth	3 hours	Ammeter	Connecting an ammeter in series	Discussion method, lecture method	Daily Oral Test
Tenth	3 hours	Voltmeter	Connecting a voltmeter in parallel	Discussion method, lecture method	Daily Oral Test
Eleventh	3 hours	Ammeter Circuit	Ammeter circuit for DC current	Discussion method, lecture method	Daily Oral Test

Twelfth					
	3 hours	Ammeter Circuit	Ammeter circuit for AC current	Discussion method, lecture method	Daily Oral Test
Thirteenth	3 hours	Current Control	Current control circuit diagram using a variable resistor	Discussion method, lecture method	Daily Oral Test
Fourteenth	3 hours	Measuring Instrument Distribution	How to distribute and install measuring devices (ammeter, voltmeter) and protection devices (switches, fuses)	Discussion method, lecture method	Daily Oral Test
Fifteenth	3 hours	General Review	General review	Discussion method, lecture method	Daily Oral Test

11. Infrastructure

1- Required textbooks	Electrical Drawing Binder
2- Main references (sources)	Electronics Workbench
A- Recommended books and references (scientific journals, reports, ...)	Author: Tariq Al-Rawi
B- Electronic references, Internet sites	World Wide Web

12. Curriculum Development Plan

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies
3. Course Name/Code	Mathmatics
4. Available Attendance Formats	First-year students/Second course
5. Semester/Year	second semester/2026
6. Number of Class Hours (Total)	2 hours per week for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025

- Course Objectives

• Understand basic mathematical concepts and foundations such as arithmetic, algebra, and geometry.
• Apply mathematical skills to solve everyday and academic problems.
• Develop logical thinking and quantitative analysis skills.
• Use mathematical methods to interpret data and draw conclusions.
• Develop problem-solving and decision-making skills using effective mathematical strategies.
• Enhance accuracy and discipline in presenting solutions and writing mathematical proofs.

10 . Course Outcomes, Teaching and Learning Methods, and Assessment
Learning and teaching method: Discussion method, lecture method
Assessment method: Daily exams, semester exams, final exam

A- Cognitive Objectives

 Acquire and understand basic mathematical concepts, such as numbers, arithmetic operations, relationships, variables, functions, and matrices.
 Understand and interpret mathematical theories and laws in different contexts.
 Distinguish mathematical properties and relationships between shapes, equations, and concepts.
 Apply mathematical knowledge to solve problems and devise appropriate solution strategies.
 Develop abstract understanding by moving from the concrete to the symbolic and abstract in mathematical thinking.

Connect mathematical concepts to other fields of knowledge, such as science, economics, and engineering.
B - Course Skill Objectives. • • Apply mathematical concepts to solve various problems accurately and efficiently. • Use mathematical methods such as graphs, modeling, and tables to organize and analyze information. • Follow systematic, organized steps to solve complex mathematical problems. • Employ critical and logical thinking skills to select the most appropriate solutions. • Develop skills in mental estimation, verifying results, and assessing their validity. • Use appropriate tools and techniques such as calculators, educational software, or digital applications to solve mathematical problems. • Express mathematical operations orally and in writing in an organized and clear manner.
C- Affective and Value-Based Objectives • Develop a positive attitude toward mathematics and an appreciation of its importance in daily life and various scientific fields. • Promote the values of accuracy and discipline in problem-solving and following systematic steps. • Instill a spirit of perseverance and patience in dealing with challenges and complex problems. • Encourage collaborative work and active participation in problem-solving within teams. • Deepen a sense of academic responsibility through commitment to completing math assignments and tasks. • Respect the opinions of others regarding different solutions and encourage constructive mathematical dialogue. • Foster a love of self-learning and discovery by exploring new mathematical patterns and laws.
D - General and transferable skills (other skills related to employability and personal development). • Analytical and logical thinking skills: The ability to analyze problems, organize data, and draw accurate conclusions. • Problem-solving skills: Develop systematic strategies to address complex challenges. • Ability to make data-driven decisions: Use numerical data and mathematical models to support practical decisions. • Technology skills: Use software and digital tools to perform calculations, modeling, and mathematical analysis. • Effective time and task management: Adherence to precise problem-solving steps and adherence to deadlines when implementing activities. • Teamwork: Collaborating with others to solve mathematical problems and group projects. • Effective communication skills: Express mathematical concepts clearly and logically, verbally and in writing. • Learning independence: Developing curiosity and the ability to pursue mathematical learning independently. • Flexibility and adaptability: Applying mathematical knowledge and skills in diverse and changing professional contexts.

10 .Course structure

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Introduction to the course, learning objectives, course content	Introduction to the course, learning objectives, course content	Discussion method, lecture method	Daily oral test
Second	2 hours	Learn about matrices, their types, determinants, and properties of determinants.	matrices, their types, determinants, and properties of determinants.	Discussion method, lecture method	Daily oral test
Third	2 hours	Learn about algebraic operations on matrices.	algebraic operations on matrices.	Discussion method, lecture method	Daily oral test
Fourth	2 hours	Learn how to solve linear equations – Cramer's method – Applications of determinants – Use of the substitution method to find current values in a multi-source electrical circuit.	solve linear equations – Cramer's method – Applications of determinants – Use of the substitution method to find current values in a multi-source electrical circuit.	Discussion method, lecture method	Daily oral test
Fifth	2 hours	Learn about trigonometric identities and trigonometric equations.	trigonometric identities and trigonometric equations.	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Learn about vectors / Vector analysis / Vector and scalar quantities / Vector algebra / Vector arithmetic operations in space. Phase and vector representation of alternating quantities, phase angle – Finding the resultant of vector quantities.	vectors / Vector analysis / Vector and scalar quantities / Vector algebra / Vector arithmetic operations in space. Phase and vector representation of alternating quantities, phase angle – Finding the resultant of vector quantities.	Discussion method, lecture method	Daily oral test
Seventh	2 hours	Learn about the unit of orthogonal vectors / vector scale / scalar and vector products / applications of vectors /	the unit of orthogonal vectors / vector scale / scalar and vector products / applications of vectors / magnetic	Discussion method, lecture method	Daily oral test

		magnetic flux / Maxwell's theory / vector multiplication using an angle / vector multiplication using coordinates.	flux / Maxwell's theory / vector multiplication using an angle / vector multiplication using coordinates.		
Eighth	2 hours	Learn about complex counters and algebraic operations on complex numbers.	complex counters and algebraic operations on complex numbers.	Discussion method, lecture method	Daily oral test
Ninth	2 hours	Learn about polar notation / converting algebraic notation to polar and vice versa and representing it graphically.	polar notation / converting algebraic notation to polar and vice versa and representing it graphically.	Discussion method, lecture method	Daily oral test
Tenth	2 hours	Learn how to find the square roots of a complex number and solve the quadratic equation of a complex number.	the square roots of a complex number and solve the quadratic equation of a complex number.	Discussion method, lecture method	Daily oral test
Eleventh	2 hours	Learn about powers and roots, as well as representing roots graphically. .	powers and roots, as well as representing roots graphically. .	Discussion method, lecture method	Daily oral test
Twelfth	2 hours	Learn about functions / trigonometric functions and trigonometric relationships / logarithmic functions.	functions / trigonometric functions and trigonometric relationships / logarithmic functions.		Daily oral test
Thirteenth	2 hours	Learn about exponential functions / hyperbolic functions / applications of graphing exponential functions for a first-order electrical circuit	exponential functions / hyperbolic functions / applications of graphing exponential functions for a first-order electrical circuit	Discussion method, lecture method	
				Discussion method, lecture method	Daily oral test
Fourteenth	2 hours	Learn about Limitations\ Limitations of algebraic and trigonometric functions / applications ..	Limitations\ Limitations of algebraic and trigonometric functions / applications ..	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	Review various topics and solve questions	Review various topics and solve questions	Discussion method, lecture method	Daily oral test

□□□ Structure Infrastructure	
1- Books The reporter Required	• الكتب المقررة: - **1. Thomas Calculus** - **2. Principles of Differential and Integral Calculus by Dr. Ali Aziz Ali** – 3. Theories and Problems in Advanced Calculus: Schaum's

	Outlines / by Murray R. Spiegel; translated by Muhammad Al-Samri; revised by Abdul Razzaq Abdul Fattah
2- the reviewer Home (Sources)	• Teacher's binder and the course instructor's YouTube channel
A Books References that Recommended With it (Magazines Scientific , reports ,....)	
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
• Updating curriculum units to include modern and realistic concepts and eliminating duplication. • Teaching methods: Adopting active learning strategies and problem-based learning. • Educational aids: Using simulation programs, educational videos, and mathematics applications. • Assessment and testing: Diversifying assessment methods between written tests, projects, and presentations.

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies
3. Course Name/Code	Calculus
4. Available Attendance Formats	First-year students/Second course
5. Semester/Year	second semester/2026
6. Number of Class Hours (Total)	2 hours per week for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025
• Course Objectives • Enable students to understand the basic concepts of calculus, including the rules of differentiation, integration, the mean value theorem, and the fundamental theorem of calculus. • Enhance students' ability to apply calculus tools to solve mathematical problems related to real life and other scientific disciplines, such as engineering, physics, and economics. • Develop students' analytical and logical thinking by understanding the behavior of functions and interpreting and analyzing graphs using derivatives and integrals. • Enhance students' proficiency in using mathematical symbols and analytical expressions to accurately and systematically present and solve problems. • Use modern technology and interactive mathematics software to support understanding of concepts and develop mathematical analysis and practical application skills. • Prepare students for advanced mathematics courses such as differential equations, real analysis, or statistics,	

which rely on the principles of calculus.
• Encourage students to think critically and solve problems independently or within a team, while enhancing their skills in self-research and continuous learning.

10 . Course Outcomes, Teaching and Learning Methods, and Assessment
Learning and teaching method: Discussion method, lecture method
Assessment method: Daily exams, semester exams, final exam

A- Cognitive Objectives
• Understand the basic concepts of differentiation, such as derivatives, differentiation rules, and rates of change.
• Understand the principles of indefinite and definite integration and their geometric and physical interpretation.
• Understand the relationship between differentiation and integration through the mean value theorem and the fundamental theorem of differentiation and integration.
• Analyze functions and explain their behavior through first and second derivatives.

B - Course Skill Objectives.
• Apply differential and integral calculus techniques to solve various mathematical problems.
• Draw and analyze curves using differentiation and integration.
• Solve real-world problems involving calculating areas, volumes, and associated rates of change.
• Employ logical and analytical reasoning to derive and verify solutions..

C- Affective and Value-Based Objectives
• Enhance self-confidence when dealing with complex mathematical problems.
• Develop a sense of curiosity and mathematical exploration.
• Appreciate the role of mathematics and its applications in daily life and other sciences.
• Commitment to accuracy and order when presenting solutions and analyzing results.
• Collaboration and teamwork in problem-solving and classroom discussions..

D - General and transferable skills (other skills related to employability and personal development).
• Analytical and critical thinking skills: The ability to analyze complex problems and break them down into solvable parts.
• Teamwork and communication: Collaborate in study groups to solve exercises and participate in class discussions.
• Use of technology in learning: Use computer software, graphing calculators, and math applications to support understanding and analysis.
• Independence and self-directed learning: Develop the ability to learn independently by exploring mathematical concepts outside of the classroom.
• Flexibility and adaptability: Confidently face mathematical challenges and seek alternative solutions.

10 .Course structure

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Introduction to the course, learning objectives, course content	Introduction to the course, learning objectives, course content	Discussion method, lecture method	Daily oral test
Second	2 hours	Learn differentiation / derivative / derivative of algebraic functions / chain rule.	about differentiation, derivatives, derivatives of algebraic functions, and the chain rule.	Discussion method, lecture method	Daily oral test
Third	2 hours	Identify implicit functions / higher-order standard derivatives.	implicit functions and higher-order standard derivatives.	Discussion method, lecture method	Daily oral test
Fourth	2 hours	Identify the derivative of trigonometric functions / the derivative of logarithmic functions / calculate the effective current in an R-L-C circuit.	the derivative of trigonometric functions / Derivative of logarithmic functions / Calculating the effective value of current in an R-L-C circuit	Discussion method, lecture method	Daily oral test
Fifth	2 hours	Learn about the derivative of exponential functions / the derivative of hyperbolic functions / calculating the time constant.	the derivative of exponential functions / Derivative of hyperbolic functions / Calculating the time constant.	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Learn about derivative applications / the tangent and normal equations / velocity and acceleration / calculations of the rate of change of voltage and current with respect to time.	derivative applications / tangent and normal equations / velocity and acceleration / change calculations of the rate of change of voltage and current with respect to time.	Discussion method, lecture method	Daily oral test
Seventh	2 hours	Learn about increasing and decreasing, maxima and minima, inflection points, graphing functions, and the C-L-R equation for a quadratic circle.	increase and decrease / maximum and minimum limits / inflection points / graphing functions Response of a second-order C-L-R circuit.	Discussion method, lecture method	Daily oral test
Eighth	2 hours	Learn about integration, indefinite integration, and integration of algebraic and logarithmic functions.	integration, indefinite integration, and integration of algebraic and logarithmic functions.	Discussion method, lecture method	Daily oral test
Ninth	2 hours	Learn about the integration of exponential and trigonometric functions.	integration of exponential and trigonometric functions.	Discussion method, lecture method	Daily oral test
Tenth Eleventh	2 hours 2 hours	Learn about general methods of integration, including substitution,	methods of integration, including substitution, partitioning, and the use	Discussion method, lecture method	Daily oral test

		partitioning, and the use of partial fractions, exponentials, and logarithmics. Construct an integrator circuit using resistance and inductance / represent an electrical circuit using integral equations.	of partial fractions, exponentials, and logarithms. Construct an integrator circuit using resistance and inductance. Represent an electrical circuit using integral equations	Discussion method, lecture method	Daily oral test
Twelfth Thirteenth	2 hours 2 hours	Learn about definite integration / applications of definite integration / area under a curve / area between two curves / approximating area using the trapezoidal and Simpson's rules.	definite integration. Applications of definite integration. Area under a curve. Area between two curves. Approximate area using the trapezoidal and Simpson's rules.	Discussion method, lecture method Discussion method, lecture method	Daily oral test Daily oral test
Fourteenth	2 hours	Learn about solving discrete, homogeneous, and linear differential equations with their various applications within the field of specialization.	Learn how to solve discrete, homogeneous, and linear differential equations and their various applications within the field of specialization.	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	Review various topics and solve questions	Review various topics and solve questions.	Discussion method, lecture method	Daily oral test

□□□ Structure Infrastructure	
1- Books The reporter Required	• الكتب المقررة: - **1. Thomas Calculus** - **2. Principles of Differential and Integral Calculus by Dr. Ali Aziz Ali** – 3. Theories and Problems in Advanced Calculus: Schaum's Outlines / by Murray R. Spiegel; translated by Muhammad Al-Samri; revised by Abdul Razzaq Abdul Fattah
2- the reviewer Home (Sources)	• Teacher's binder and the course instructor's YouTube channel
A Books References that Recommended With it (Magazines Scientific , reports ,....)	
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
•Updating examples to include applications from physics and economics, organizing the topics in a logical sequence, and adding advanced optional topics. •Incorporating active learning, problem-based learning, and the use of computer simulations and interactive presentations. •Incorporating programs such as GeoGebra, MATLAB, or Wolfram Alpha to explain concepts visually. •Diversifying assessment methods to include projects, quizzes, analytical assignments, and oral assessments. • Organizing math competitions, advanced problem-solving workshops, and discussion groups.

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course title/code	Crimes of the Baath regime in Iraq NTU203
4. Programme (s) to which it contributes	Technical diploma
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical) Scientific discussions
6. Semester/Year	Annual
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	1- 9 - 2025
9. **Aims of the Course** 1- Providing students with basic concepts related to the definition of crimes, their types and divisions. 2- Definition of crimes and violations of the former regime and types of international crimes 3-Introducing mass grave crimes and violations of Iraqi laws 4- Addressing environmental crimes, the destruction of cities, policies of demographic change and extrajudicial detention 5- Explaining the role of the Supreme Criminal Court in dealing with the crimes of the Baath regime	
10. Course outcomes and teaching, learning and evaluation methods	
A. Cognitive objectives A1- Enabling students to understand the concept of crime and the types of national and international crimes. A2- Developing the knowledge aspects of the protection and guarantees of human rights. A3- Developing students' ability to distinguish between crimes and human rights violations and how to confront them	
B - The skills objectives of the course. B1 – Enable students to understand the concept of national and international crime. B2 - Enable students to know human rights and how to defend these rights. And know the guarantees related to them.	

Teaching and learning methods
((Theoretical lectures, periodic reports / periodic tests / practical case studies)).
Evaluation methods
((Periodic exams / direct questions / preparation of special reports))
C- Emotional and value goals C1- Development of legal culture C2- Carrying out his duties in the workplace with professional motives. C3- Instilling the values of tolerance and cooperation in society.
Teaching and learning methods
((Student groups / case studies / preparation of special reports))
Evaluation methods
((Periodic exams / direct questions / preparation of special reports))
D - Transferable general and qualifying skills (other skills related to employability and personal development). D1- Developing the skills of students in the field of public service or the private sector. D2- Developing personal skills to develop students' legal culture.

11. Course Structure/ Level the second

Week	Hours	Unit/Module or Topic Title	ILOs	Teaching Method	Assessment Method
1	2	-Crimes of the Baath regime under the Law of the Supreme Iraqi Criminal Tribunal in 2005 -The concept of crimes and their divisions -Definition of crime linguistically and idiomatically	Knowledge and practical application	theoretical	Tests & Discussion
2	2	-Crime sections -Crimes of the Baath regime as documented in the Law of the Supreme Iraqi Criminal Tribunal in 2005	Knowledge and practical application	theoretical	Tests & Discussion
3	2	- Types of international crimes - Decisions issued by the Supreme Criminal Court	Knowledge and practical application	theoretical	Tests & Discussion
4	2	- Psychological and social crimes and their effects. - Mental Crimes - Mechanisms of psychological crimes - Effects of mental crimes	Knowledge and practical application	theoretical	Tests & Discussion
5	2	- Social crimes - Militarization of society - The position of the Baath regime on religion	Knowledge and practical application	theoretical	Tests & Discussion
6	2	- Violations of Iraqi laws - Photos of human rights violations and crimes of the authority	Knowledge and practical application	theoretical	Tests & Discussion
7	2	- Some decisions on political and military	Knowledge and	theoretical	Tests &

		violations of the Baath regime	practical application		Discussio n
8	2	- Places of Prisons and Detention of the Baath Regime	Knowledge and practical application	theoretical	Tests & Discussio n
9	2	- Environmental crimes of the Baath regime in Iraq	Knowledge and practical application	theoretical	Tests & Discussio n
10	2	- War and radioactive contamination and mine explosions	Knowledge and practical application	theoretical	Tests & Discussio n
11	2	- Destruction of towns and villages - Scorched earth policy	Knowledge and practical application	theoretical	Tests & Discussio n
12	2	- Drainage of marshes - Dredging palm groves, trees and plantings	Knowledge and practical application	theoretical	Tests & Discussio n
13	2	- Mass grave crimes - Mass graves	Knowledge and practical application	theoretical	Tests & Discussio n
14	2	- Mass graves and genocide committed by the Baathist regime	Knowledge and practical application	theoretical	Tests & Discussio n
15	2	- Chronological classification of genocide graves in Iraq	Knowledge and practical application	theoretical	Tests & Discussio n

12.Infrastructure	
1 Required textbooks	General Books
2 Main references (sources)	Literature on crimes, penal law and human rights available in the college library and the central library of the university
3 Electronic references, websites	Human rights websites.

13.Course development plan
Access to modern scientific literature There are no proposals because the subject is taught in the current academic year for the first time

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University

2. University/ Department	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course title/code	Professional Ethics NTU204
4. programmer (s) to which it contributes	Technical Diploma
5. Modes of Attendance offered	1 -Weekly lesson schedule (theoretical(2- Discussions
6. Semester/Year	Second semester/second level
7. Number of hours tuition (total)	30 hours (the number of theoretical hours during the 15 weeks)
8. Date of production/revision of this specification	1 – 9 - 2025

1.Course objectives

1-Teaching students that their commitment to the ethics of their professions is an integral part of the correct practice of them, and this commitment is their duty toward

2-Teaching the professional ethics course is considered the cornerstone of preparing future generations professionally and ethically.

3-Teaching a professional ethics course to institute students represents the right beginning for any society that seeks to raise the level of ethical practice among professionals.

2.Course outcomes and teaching, learning and evaluation methods

A- Cognitive objectives

a1- Identify the principles of ethical analysis and thinking In various professional situations.

a2- Know the difference between Work and profession

a3-.RecognitionPatient rights

B - The skills objectives of the course.

B1 –Brainstorming skill inside the hall.

B2 -Give examples and modern applications to enhance understanding.

Teaching and learning methods

Traditional lecture, report writing, discussion

Evaluation methods

Daily written and oral tests, semester and final exams, commitment to assignments, attendance and commitment, feedback (testing the student on the previous subject), self-evaluation (questions are set for the student by the teacher and the student answers the questions, and the teacher also answers the same questions and asks the student to evaluate himself in light of Teacher's answers (analytical and deductive questions).

C- Emotional and value goals

C1-The student understands the meaning of the basic terms of the curriculum.

C2- That the student understands Characteristics and duties of a medical technician.

C3- That The student distinguishes the importance of ethics for the individual and society.

C4- That The student compares the concept of work, profession and craft.

Teaching and learning methods

Traditional lecture, feedback, deductive and analytical thinking questions.

Evaluation methods

Written tests, semester and final exams, daily tests, and commitments to assignments such as making reports and then discussing the reports, attendance and commitment.

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

D1- Skills of modern interactive teaching methods among students.

D2- Scientific competition skills among students through asking questions.

11. Course structure\ Level the second					
week	**hours**	**Required learning outcomes**	**Name of the unit/topic**	**Teaching method**	**Evaluation method**
1	2	identification requester Concept Moral	Moral.	Theoretical lectures Group discussions	Duties Quizzes Reports
2	2	Define the student the difference between work and profession	Work and profession.	Theoretical lectures Group discussions	Duties Quizzes Reports
3	2	The student understands the nature of professional ethics	Professional ethics.	Theoretical lectures Group discussions	Duties Quizzes Reports
45&	2	Introducing the student to the values and ethics of the profession	Values and professional ethics.	Theoretical lectures Group discussions	Duties Quizzes Reports
6&7	2	Introducing the student to patterns of unethical behavior Administrative corruption + bribery + fraud at work	Patterns of unethical behavior In the profession.	Theoretical lectures Group discussions	Duties Quizzes Reports
8	2	Understand the means of consolidating values	Means and methods of consolidating professional ethics.	Theoretical lectures Group discussions	Duties Quizzes Reports
9	2	Introducing the student to the duties of medical staff	Ethics of practicing medical professions Characteristics and duties of a medical technician.	Theoretical lectures Group discussions	Duties Quizzes Reports
10	2	Introducing the student to patient rights	1.Patient rights.	Theoretical lectures Group discussions	Duties Quizzes Reports
11&12	2	Introducing the student to the role of the medical technician in society	2.The medical technician's relationship with society and his responsibility towards the environment and public safety.	Theoretical lectures Group discussions	Duties Quizzes Reports

13&14	2	Clarifying the medical technician's relationship with his co-workers and his subordinates	3.Professional relations (the medical technician's relationship with his colleagues in the health institution.	Theoretical lectures Group discussions	Duties Quizzes Reports
15	2	Understand and explain the ethics of teaching and learning to patients	4.Ethics of teaching and learning for patients.	Theoretical lectures Group discussions	Duties

12.Infrastructure

Unified curriculum for technical universities in Iraq	1- Required prescribed books
● Abu Al-Khair, Muhammad Saeed (B.T): Guide to Professional Ethics, Faculty of Arts, Zagazig University. ● Hassan, Abdul Mahdi Abdul Reda (bt): Rules of professional ethics for nurses and midwives in Iraq, website. www.uobabylon.edu.iq/eprints/pubdoc_10_6984_150.doc ● Al-Hourani, Ghaleb Saleh Watanash, Salama Youssef (2007): Academic ethics for university professors**fromFaculty members' point of view University of Jordan**Studies Journal, Educational Sciences, Vol.34), Issue (2), Jordan. **Rabhi, Israa (2018): The concept of bribery,**Internet site.https://mawdoo3.com ● Mohamed Ahmed (2018): What is the difference between a gift and a bribe?https://mawdoo3.com/ ● National Center for Developing Faculty and Leadership Capabilities (2011): Ethics of Scientific Research, Program Series, Egypt. ● Mishal, Talal (2018): What is the importance of ethics, website. https://mawdoo3.com/ Al-Mashharawi, Ahmed Hussein (2014):The role of professional ethics in promoting social responsibility in Palestinian government hospitals (Al-Shifa Medical Complex as an example), Master's thesis in the program ● Saudi Commission for Health Specialties (2012): Health Practitioner Ethics, 3rd edition, p. 44. ● Quality Assurance Unit (2017): Guide to Professional Ethics, Faculty of Arabic Language, Al-Azhar University, Cairo. ● Iraqi Ministry of Health (2018): Code of Medical Research Ethics, National Center for Training and Human Development. Iraqi Ministry of Health (2017): Principles of medical ethics in Iraqi health institutions.	2- Main references (sources)

	Recommended books and references (scientific journals, reports,...)
Modern sources via the Internet	B - Electronic references, Internet sites...

13.Course development plan
-Access to modern scientific literature -Periodic review of the course

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course title/code	Computer
4. Programme (s) to which it contributes	Technical diploma
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical and practical) * Scientific discussions, seminars, other activities
6. Semester/Year	Annual
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	1- 9 - 2025
9. **Aims of the Course** 1- Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization. 2- Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization. 3. Perform his duties at the workplace for professional motives.	
10. Course outcomes and teaching, learning and evaluation methods	
A.Cognitive objectives A1- Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization.	
B - The skills objectives of the course. B1 - Teaching the student the skills of working on the computer and the use of ready-made applications and the principles of the Internet in the field of specialization.	
Teaching and learning methods	
((Theoretical lectures / practical lectures / field visits / solving examples / seminars / summer training))	
Evaluation methods	
((Oral exams / written tests / weekly reports / daily attendance / semester and final exams))	
C- Emotional and value goals C1- Perform his duties at the workplace for professional motives.	
Teaching and learning methods	
((Theoretical lectures / practical lectures / field visits / solving examples / seminars / summer training))	
Evaluation methods	
((Oral Tests / Written Tests / Observation / Student Cumulative Record))	
D - Transferable general and qualifying skills (other skills related to employability and personal development).	

D1- Improve their discussion skills.
D2- Raising their research perceptions and transferring the student from the stage of teaching to learning.

11. Course Structure

Week	Hours	Unit/Module or Topic Title	ILOs	Teaching Method	Assessment Method
2&1	2	Features of the word processor / running the word / the basic elements of the word window / flipping the language / definition of the paragraph / merging and splitting the paragraph / selecting (shading) the text.	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
3	2	New / Open Inventory File / Close Document / Save New Document / Save Existing Document / Preview Before Printing / Close Document / End Word	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
4	2	Clipboard: Cut / Copy / Paste / Copy Format Font: Change font / font size / enlarge and reduce font / clear formatting / change font color / text highlight color / subscript / superscript text / change case / underline style / effects / character spacing Paragraph: Numbering / Bullets / Create a bulleted list to existing text / Cancel bullets / Indent / Paragraph spacing / Line spacing / Text direction / Alignment / Borders & Shading Styles: Normal / No Spacing / Heading 1 / Heading 2 / Subtitle / Change Styles / Show Preview / Disable Linked Styles / Options Edit: Find/Go/Replace/Select	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
5	2	Pages: Blank Page / Cover Page / Page Break Table: Insert Table / Draw Table / Convert Text to Table / Excel Data Table / Quick Tables / Table Styles / Draw Table Borders Illustrations: Picture / Clip Art / Prepared Shapes / Smart Art Drawing / Chart	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
6	2	Header and footer: header / footer / page number Text: text box / ornate text Word art / signature line / date and time / object / equation / symbol.	Knowledge and practical application	Practical + Theoretical	Tests & Discussion
7	2	Features: Themes / Colors / Fonts / Effects.	Knowledge and practical application	Practical + Theoretical	Tests & Discussion

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course title/code	Arabic Language NTU103
4. Programme (s) to which it contributes	Technical diploma
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical) * Discussions and reports
6. Semester/Year	Annual
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	1- 9 - 2025

9. **Aims of the Course**

1- Enabling the student to read correctly.

2- Enabling the student to write correctly and use punctuation marks.

3- The student should acquire the ability to use the Arabic language correctly.

4- Introducing the student to the correct Arabic language words, structures and sound methods in an interesting way.

5- Accustom the student to sound and clear expressions of his ideas.

6- Helping the student to understand complex structures and mysterious methods.

10. Course outcomes and teaching, learning and evaluation methods

A.Cognitive objectives

A- The student should recognize common mistakes in writing Arabic in order to avoid them

B - The student should recognize the punctuation marks and use them correctly

C - The student should distinguish between the solar lam and the lunar lam, which helps to pronounce it correctly

D - The student differentiates between Dhad and Zaa, and this is what helps him to avoid falling into a spelling error

E - To distinguish between the verb, the noun and the letter, as this is what his Arabic speech is based on.

F- He must be able to write the hamza in its correct position correctly.

B - The skills objectives of the course.

B1 – Providing the student with a linguistic wealth that makes him more able to correctly express what he wants.

B2- Correcting the student's tongue and preventing it from error

Teaching and learning methods

((Theoretical lectures / listening lectures / conversation lectures / interactive lectures / research in libraries and the Internet on specific topics)).

Evaluation methods

((Oral tests / written tests / weekly reports / daily attendance / participation and interaction in lectures / semester and final exams))

C- Emotional and value goals

C1- Thinking, activation and organization development

C2- Working to make the student's imagination fertile imagination by highlighting the aesthetics of the language and thus enabling him to express the essence of the soul in a proper way.

Teaching and learning methods

((Theoretical lectures / seminars / conducting debates between students / making reports))

Evaluation methods

((Oral Tests / Written Tests / Observation / Student Cumulative Record))

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

D1- The ability to develop and develop his expressive skills such as poetry and story.
D2- The ability to communicate with the outside world properly.

11. Course Structure

Week	Hours	Unit/Module or Topic Title	ILOs	Teaching Method	Assessment Method
1	2	Introduction to linguistic errors – Taa Al-Marbouta and Al-Taa Al-Maktaba	1. Identify the types of linguistic errors. 2. Differentiate between open Taa and Taa tethered	Discussion method, lecture method	Oral test
2	2	Rules for writing the elongated and compartment thousand – solar and lunar letters	1. Differentiate between the writing of the extended thousand and the compartment and the positions of the writing of the two thousand 2. Differentiate between solar letters and lunar letters	Discussion method, lecture method	Oral test
3	2	Al-Daad and Al-Zaa	Differentiate between Dhad and Z	Discussion method, lecture method	Oral test
4	2	Hamza writing	Enable the student to write the hamza correctly	Discussion method, lecture method	Oral test
5	2	Punctuation	Recognize punctuation and write it in the correct location	Discussion method, lecture method	Oral test
6	2	Noun and verb and differentiate between them	1.Recognize the noun and verb and indicate the sign of each 2. Differentiate between noun and verb 3. Indication of the types of verb 4. Differentiate between types of verbs	Discussion method, lecture method	Oral test
7	2	Effects	identify the types of effects and differentiate between them	Discussion method, lecture method	Oral test
8	2	Number	Enable the student to write numbers correctly	Discussion method,	Oral test

				lecture method	
9	2	Applications of common linguistic errors	Recognize and avoid common language errors	Discussion method, lecture method	Oral test
10	2	Applications of common linguistic errors	Recognize and avoid common language errors	Discussion method, lecture method	Oral test
11	2	Noon and Tanween meanings of prepositions	1. Differentiate between Nun and Tanween 2.Recognize the meanings of prepositions	Discussion method, lecture method	Oral test
12	2	Formal aspects of administrative discourse	Identify the formal aspects of administrative discourse	Discussion method, lecture method	Oral test
13	2	The language of administrative discourse	Recognize the language of administrative discourse	Discussion method, lecture method	Oral test
14	2	The language of administrative discourse	Recognize the language of administrative discourse	Discussion method, lecture method	Oral test
15	2	Samples of administrative correspondence	Identify samples of administrative correspondence	Discussion method, lecture method	Oral test

12.Infrastructure	
Required reading:	Textbooks: General Arabic Language Binding for Technical Universities by (Dr. Safaa Kazem Makki and Dr. Lama Muhammad Younis
Main references (sources)	1- Clear dictation: Abdul Majeed Al-Nuaimi, Daham Al-Kayyal, Dar Al-Mutanabbi Library, Baghdad, 6th edition, 1987 AD. 2- Lessons in language, grammar and spelling for state employees: Ismail Hammoud Atwan and others, Ministry of Education Press No. (3), Baghdad, 2nd edition, 1984. 3- Arabic language for the third intermediate grade: Fatima Nazem Al-Attabi, et al., 1st edition, 2018. 4 - General Arabic language for sections other than specialization: Abdul Qadir Hassan Amin and others, Ministry of Higher Education and Scientific Research, 2nd Edition, 2000.

	5- Inspired by Arabic literature: Haval Muhammad Amin, Al-Saadoun Press, Baghdad.
Electronic references, Internet sites...	World Wide Web

13.Course development plan
Correcting the linguistic errors that occurred in the manual to be taught and trying to add a definition to some of the terms contained in the fascicle, especially since the Arabic language fascicle was prepared for non-specialists in the Arabic language, and this leads to making the prescribed vocabulary more accurate and clear.

1. Educational institution	the university Technology Northern
2. Academic department/center	Department of Electronic and Communication Technologies / Mosul Technical Institute
3. Course name/code	control
4. Available forms of attendance	theoretical + Practical
5. Semester/year	courses
6. Number of study hours (total)	4 hours / week x decision =60 hours (theoretical And my work)
7. Date this description was prepared	1 – 9 - 2025

1. Course Objectives

• Understand the principles of electrical control in medical devices.
• Distinguish between open-circuit and closed-circuit control circuits.
• Examine control components of both open and closed-circuit types.
• Design and analyze control systems.

10. Course Outcomes, Teaching, Learning and Evaluation Methods

A- Cognitive Objectives

After completing the lesson (lecture) the student will be able to:
A1- Know the technology of automatic control systems.
A2- Distinguish between open-loop and closed-loop control systems.
A3- Know the types of industrial controllers.
A4- Evaluate the performance of the control system**.**

B - Course specific skill objectives.

B1- Knowledge of automatic control systems technology.
B2- Distinguishing between open-loop and closed-loop control systems.
B3- Knowledge of types of industrial controllers.
B4- Evaluation of the performance of the control system.

Teaching and learning methods

1- Theoretical lectures
-2 Scientific discussion in classrooms
-3 Small group method
-4 Conducting practical experiments in laboratories
-5 Study seminars and presentation of the latest scientific developments globally by students
6- Scientific films and other means of clarification
7- Methodological training
8- Summer training

Evaluation Methods

- Oral and written tests
- Midterm and final exams
- Practical reports
- Homework
- Daily assessment

C- Emotional and value-based objectives

C1- He has academic and technical information, experience and skill in the field of control circuits and control systems of various types.
C2- He can keep pace with the rapid development in the field of modern control devices
C3- He can manage, prepare and implement periodic programs for maintenance and continuity of control devices..

Teaching and learning methods

- Theoretical lectures
- Scientific discussion in classrooms
- Small group method
- Conducting practical experiments in laboratories
- Study seminars and presentation of the latest scientific developments globally by students
- Scientific films and other means of clarification

- Methodological training
- Summer training

Evaluation Methods

- Oral and written tests
- Midterm and final exams
- Practical reports
- Homework
- Daily assessment

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

D1- Gaining the experiences that qualify them to deal with the necessities of life, including experience in the field of maintenance of control devices.

D2- Gaining the experiences that qualify them to deal with control circuits.

D3- Gaining the experiences in reverse engineering electronic maps for control devices.

D4- Gaining the skills necessary to identify and repair faults and maintain various control devices

12. structure The decision / Level the second

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
the first	2	Distinguish between open-loop and closed-loop control system	Introduction and knowledge about control engineering, open circuit and closed circuit	Theoretical lectures, scientific discussions, screening of scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**
the second	2	Knowing the components of the receiver and how it works	Industrial control of electric motors (receiver)	=	=
the third	2	Knowing what a relay is, its types, and how to connect it to motors to protect it	Use of relays in controlling motor operation	Theoretical lectures, scientific discussions, screening of scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**

Fourth	2	Knowing the structure of a single-phase motor and building the power circuit and control circuit for a single-phase and three-phase motor to achieve the motor start and stop	Control system for single and three phase motor	Theoretical lectures and scientific discussion Showing scientific films, the latest developments and means of clarification	**Exams Daily Short Duties Home, Exams Quarterly And final**
Fifth	2	Know the purpose of the block diagram and the theories used to simplify simple systems.	Transfer function - Block diagrams - Algebra and simplification	=	=
Sixth	2	Learn Mason's Rule and how to simplify a complex control system using Mason's Rule,	Signal Flow Graph, and Mason's Rule.	=	=
Seventh	2	The purpose of using the Laplace transform and how to use it	Math Review - Laplace Transform	=	=
eighth	2	Ability to convert sine and exponential functions to algebraic functions	Solving linear differential equations using Laplace's method		
Ninth	2	Draw the s-plane by identifying the poles and zeros to determine the stability of the system	Identify the s-plane Identify the poles and zeros of s-plane control systems Determine the stability level		
tenth	2	Distinguish between types of input signals (step function, slope function, and acceleration function)	Types of input signals		
eleventh	2	How to be able to classify control systems by type	Classification of control systems (type and rank of the	Theoretical lectures and scientific	**Exams Daily Short**

		and rank of the system	system))	discussion Showing scientific films, the latest developments and means of clarification	**Duties Home, Exams Quarterly And final**
twelfth	2	Finding the steady-state error of a different input signal by finding the error coefficients	Steady-state error	=	=
thirteenth	2	Finding the transient response of the system by the denominator of the transfer function	Transient response of second-order systems	=	=
fourteenth	2	Analysis of the control system by finding the time specifications of the system (delay time, peak time, rise time, maximum overshoot, dwell time)	Time response of a second-order system - factors determining stability	=	=
fifteenth	2	Drawing a closed-loop control system using proportional, differential and integral controllers and knowing the operating principle of each controller.	Electronic controllers - their types - proportional, differential and integral.		

13. Structure Infrastructure	
The Control Book by Assistant Professor Diaa Mahdi Faris	1- Books The reporter Required
Electrical control technology book233	2- the reviewer Home (Sources)

	A Books References that Recommended With it (Magazines Scientific , reports ,....)
Technical Institute website / Mosul	for - the reviewer Electronic, Sites The Internet ....

14. Plan Curriculum Development
6- Curriculum Development 7- Laboratories Development 8- Continuing Education Courses 9- Showing Scientific Films 10- Holding Scientific Visits 11- Organizing Study Groups

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies
3. Course Name/Code	Basic Electronic Circuits ETEC201/
4. Available Attendance Formats	Second-year students/Second course
5. Semester/Year	First semester/2026
6. Number of Class Hours (Total)	2 hours per week for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025

- Course Objectives
- • Understand the operation of operational amplifiers.
- • Study operational amplifiers and their applications in various circuits.
- • Apply theoretical concepts in practical laboratory settings.
- • Develop problem-solving skills and use of simulation tools..

10 . Course Outcomes, Teaching and Learning Methods, and Assessment
Learning and Teaching Method: Discussion Method, Lecture Method
Assessment Method: Daily Exams, Midterm Exams, Final Exam

A- Cognitive Objectives

• Understand the basic concepts of operational amplifiers.
• Distinguish between different types of amplifiers (such as inverting amplifiers and others) and identify their characteristics.
• Design and analyze various operational amplifier circuits using different laws.
• Explain how to perform mathematical operations using operational amplifiers.
• Design circuits that represent specific mathematical equations.
• Apply these circuits practically using simulation programs or in practice.
• Define the concept of an analog computer and its basic functions.

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B - Course Skill Objectives.

B1 - Focuses on the practical and technical skills students acquire through applying theoretical concepts in laboratories, projects, and simulation programs.
B2 - Assemble and build electronic circuits in the laboratory.
B3 - Properly use electronic measuring devices such as the oscilloscope, multimeter, and function generator.
B4 - Simulate electronic circuits using Multisim to analyze performance before actual implementation.
B5 - Read and interpret laboratory experiment results and analyze the results.
B6 - Apply electrical safety measures while working in the laboratory.
B7 - Construct circuits that simulate mathematical operations (such as addition, subtraction, integration, etc.) in an analog computer using Op-Amps..

C- Affective and Value-Based Objectives

C1- Develop a sense of responsibility and adherence to laboratory regulations and instructions.
C2- Commitment to engineering work ethics, such as accuracy, honesty, and scientific integrity.
C3- Work effectively within a team while implementing group projects and experiments.
C4- Ensure the safety of electronic devices and components during use.
C5- Respect the views of others and share ideas positively during classroom and laboratory discussions.

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

D1 - Ability to solve technical problems.
D2 - Logical reasoning to arrive at effective solutions.
D3 - Interpret results and analyze circuit performance.
D4 - Learn to write detailed technical reports.
D6 - Conduct laboratory experiments within teams.
D7 - Use simulation software in design and analysis.
D8 - Commitment to submitting reports and projects on time.
D9 - The student must be proficient in using simulation software tools.

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Operational Amplifier	Operational Amplifier Applications	Discussion method, lecture method	Daily oral test
Second	2 hours	Operational Amplifier	Operational Amplifier Construction and Specifications	Discussion method, lecture method	Daily oral test
Third	2 hours	Operational Amplifier	Reflective/Mould Amplifier	Discussion method, lecture method	Daily oral test
Fourth	2 hours	Operational Amplifier	Non-Reflective/Mould Amplifier	Discussion method, lecture method	Daily oral test
Fifth	2 hours	Operational Amplifier	Reflective/Mould Collector	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Operational Amplifier	Non-reflective/non-moldable collector	Discussion method, lecture method	Daily oral test
Seventh	2 hours	Operational Amplifier	Subtractor	Discussion method, lecture method	Daily oral test
Eighth	2 hours	Operational Amplifier	(Comparator Analog) Comparison table between the subject and the comparator	Discussion method, lecture method	Daily oral test
Ninth	2 hours	Operational Amplifier	Zero Crossing) (Detector	Discussion method, lecture method	Daily oral test
Tenth	2 hours	Operational Amplifier	Integrator	Discussion method, lecture method	Daily oral test
Eleventh	2 hours	Operational Amplifier	Differentiator	Discussion method, lecture method	Daily oral test
Twelfth	2 hours	Operational Amplifier	Nonlinear Uses of Operational Amplifiers Full Wave Rectifier-	Discussion method, lecture method	Daily oral test
Thirteenth	2 hours	Operational Amplifier		Discussion method, lecture method	Daily oral test
Fourteenth	2 hours	Analog Computer	(Computer Analogue)	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	Analog Computer	(Computer Analogue)	Discussion method, lecture method	Daily oral test

11. Structure Infrastructure

1- Books The reporter Required	• الكتب المقررة: • **DESIGN WITH OPERATIONAL AMPLIFIERS AND ANALOG INTEGRATED CIRCUITS** **ELECTRONIC DEVICES AND CIRCUIT THEORY**

2- the reviewer Home (Sources)	• Teacher's binder and the course instructor's YouTube channel
A Books References that Recommended With it (Magazines Scientific , reports ,....)	
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
1- Updating the course content to keep pace with recent developments in the field of electronics. 2. Linking theoretical concepts to industrial and real-life applications. 3. Updating examples and applications to include modern technologies. 4. Preparing advanced and additional content.

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies
3. Course Name/Code	Advanced Electronic Circuits/ETEC204
4. Available Attendance Formats	Second-year students/Second course
5. Semester/Year	First semester/2026
6. Number of Class Hours (Total)	2 hours per week for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025

- Course Objectives
- • The student will distinguish between the different types of multivibrator circuits: monostable, bistable, and astable.
- • The student will explain the operating principle of the 555 integrated circuit and its uses in different vibration modes.
- • The student will understand the role of the Schmitt trigger and the triangle wave generator in signal generation.
- • The student will explain the concept of feedback.
- • The student will distinguish between the types of active filters and explain how to design them using an

operational amplifier.

- • The student will describe the operation of the silicon controlled rectifier (SCR) and its use in electronic circuits.
- • The student will practically implement circuits that rely on operational amplifiers as oscillators or active filters.
- • The student will deduce the effect of changing components on the performance of oscillator circuits and filters.
- • The student will work as a collaborative team while conducting experiments and writing laboratory reports.
- • The student will demonstrate professional responsibility in documenting results and analyzing errors.
- • The student will practically implement electronic circuits.

10 . Course Outcomes, Teaching and Learning Methods, and Assessment

Learning and Teaching Method: Discussion Method, Lecture Method

Assessment Method: Daily Exams, Midterm Exams, Final Exam

A- Cognitive Objectives

• Understand the theoretical principles of electronic oscillators that generate a square signal using transistors and the 555 timer.

• Analyze the characteristics and design of low-pass and high-pass filter circuits using passive and active components.

• Distinguish between advanced oscillator types such as Hartley, Colpitts, and single-phase oscillators in terms of structure, operation, and applications.

• Explain the operating mechanism of the thyristor family, with a focus on the silicon controlled rectifier (SCR) and its uses in control circuits.

B - Course Skill Objectives.

B1 - Focuses on the practical and technical skills acquired by the student through the application of theoretical concepts in laboratories, projects, and simulation programs.

B2 - The student will be able to design and implement single-, double-, and astable oscillator circuits using transistors and the 555 integrated circuit.

B3 - Properly use electronic measuring devices such as the oscilloscope, multimeter, and function generator.

B4 - The student will use operational amplifiers to construct waveform generators (such as triangular), active filters (LPF, HPF), and oscillators.

B5 - The student will compare theoretically calculated values with the results obtained from practical experiments and explain the differences.

B6 - Apply electrical safety measures during laboratory work.

B7 - The student will prepare comprehensive technical reports that include the objectives of the experiment, implementation steps, results, and analysis.

C- Affective and Value-Based Objectives

C1- Develop a sense of responsibility and adherence to laboratory regulations and instructions.

C2- Commitment to engineering work ethics, such as accuracy, honesty, and scientific integrity.

C3- Work effectively within a team while implementing group projects and experiments.

C4- Ensure the safety of electronic devices and components during use.

C5- Respect the views of others and share ideas positively during classroom and laboratory discussions.

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

D1 - Ability to solve technical problems.

D2 - Logical reasoning to arrive at effective solutions.

D3 - Interpret results and analyze circuit performance.

D4 - Learn to write detailed technical reports.

D6 - Conduct laboratory experiments within teams.

D7 - Use simulation software in design and analysis.

D8 - Commitment to submitting reports and projects on time.

D9 - The student must be proficient in using simulation software tools.

Course structure .10

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Multivibrators by using Transistor	Transistor as Switch Astable Multivibrators (A.M)	Discussion method, lecture method	Daily oral test
Second	2 hours	Multivibrators by using Transistor	Monostable Multivbrator (M.M)	Discussion method, lecture method	Daily oral test
Third	2 hours	Multivibrators by using Transistor	Bistable Multivbrator (B.M)	Discussion method, lecture method	Daily oral test
Fourth	2 hours	555 Integrated Circuit	integrated circuit 555 components	Discussion method, lecture method	Daily oral test
Fifth	2 hours	Multivibrators by using 555	Timer 555 As Monostable Multivibrator	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Multivibrators by using 555	Timer 555 in Astable Multivibrator Mode	Discussion method, lecture method	Daily oral test
Seventh	2 hours	Schmitt Trigger	How to Design a Schmitt Trigger	Discussion method, lecture method	Daily oral test
Eighth	2 hours	Schmitt Oscillator	How to Design a Schmitt Oscillator	Discussion method, lecture method	Daily oral test
Ninth	2 hours	Triangle Wave Generator	Assembling a Triangular Waveform Generator	Discussion method, lecture method	Daily oral test
Tenth	2 hours	Oscillator Using an Operational Amplifier	Monostable Oscillator Using an Operational Amplifier	Discussion method, lecture method	Daily oral test
Eleventh	2 hours	Active Filters	HPF Design	Discussion method, lecture method	Daily oral test
Twelfth	2 hours	Active Filters	LPF Design	Discussion method, lecture method	Daily oral test
Thirteenth	2 hours	feedback	Oscillators Feedback Definition and Types	Discussion method, lecture method	Daily oral test
Fourteenth	2 hours	Oscillators	Designing Three Types of Oscillators	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	Oscillators and silicon-controlled rectifiers	Designing Three Types of Oscillators Controlled Silicon Rectifier	Discussion method, lecture method	Daily oral test

□□□ Structure Infrastructure

1- Books The reporter Required	• الكتب المقررة: **Multivibrators Edited by Alexander Schure, Ph. D., Ed. D.**

	Fundamentals of Electric Circuits" by Charles K. Alexander and Matthew N. O. Sadiku **Electronic Devices and Circuit Theory"** by Robert L. Boylestad and Louis Nashelsky
2- the reviewer Home (Sources)	• Teacher's binder and the course instructor's YouTube channel
A Books References that Recommended With it (Magazines Scientific , reports ,....)	
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
1. Updating the course content to keep pace with recent developments in the field of electronics. 2. Linking theoretical concepts to industrial and real-life applications. 3. Updating examples and applications to include modern technologies. 4. Preparing advanced and additional content.

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies
3. Course Name/Code	Analog Communications/ETEC203
4. Available Attendance Formats	Second-year students/Second course
5. Semester/Year	First semester/2026
6. Number of Class Hours (Total)	2 hours per week for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025
• Course Objectives • It aims to provide students with the knowledge, understanding, and skills necessary to understand communication systems based on analog signals, both theoretically and practically, with a focus on modulation, transmission, and reception. • Understand analog signals, classify them, and analyze their properties, such as time, frequency, amplitude, and	

phase.
• Study the concepts and techniques of amplitude modulation (AM), frequency modulation (FM), and phase modulation (Ph.M).
• Calculate the required bandwidth for each type of modulation.
• Provide students with practical skills and develop their ability to use devices such as oscilloscopes and frequency generators.
• Link theoretical knowledge to practical applications.
• Develop students' scientific thinking and research skills..

10 . Course Outcomes, Teaching and Learning Methods, and Assessment
Learning and Teaching Method: Discussion Method, Lecture Method
Assessment Method: Daily Exams, Midterm Exams, Final Exam

A- Cognitive Objectives
The Analog Communications course aims to provide students with a theoretical and analytical understanding of the fundamentals of communication systems that rely on analog signals, establishing a solid foundation for understanding modern communication systems. The cognitive objectives can be summarized as follows:
• Understand the basics of signals.
• Define and differentiate analog signals.
• Understand signal characteristics such as amplitude, frequency, phase, and frequency spectrum.
• Familiarize themselves with the concepts of modulation.
• Understand the need for modulation in communication systems.
• Learn the basic modulation techniques of amplitude modulation (AM), angle modulation (FM), frequency modulation (FM), and phase modulation (Ph.M).
• Analyze the frequency spectrum of modulated signals.
• Calculate bandwidth and power efficiency.
• Understand the signal-to-noise ratio (SNR) and its impact on communication quality.
• Understand the basic components of an analog communication system, as follows:
• Transmitters and receivers.
• Modulators and demodulators.
• Ability to solve problems related to analog communications..

B - Course Skill Objectives.
• B1 - Develop skills in practical application, technical analysis, and the use of devices and tools related to communications systems. These objectives aim to prepare students to apply theoretical concepts in a practical or laboratory setting.
• B2 - Build AM and FM circuits using electronic components and use measuring devices (signal generators and oscilloscopes) to test the performance of these circuits.
• B3 - Measure signal characteristics such as frequency, amplitude, and phase using an oscilloscope.
• B4 - Apply programs such as Multisim to simulate analog communications systems.
• B5 - Link theoretical aspects to practical applications.

C- Affective and Value-Based Objectives
• C1- Develop an interest in the field of communications
• C2- Demonstrate enthusiasm for learning analog communications concepts and applications.
• C3- Appreciate the role of analog communications in the development of technology and science.
• C4- Adhere to safety regulations and use equipment responsibly in the laboratory
• C5- Develop technical problem-solving skills using logical reasoning.

D - General and transferable skills (other skills related to employability and personal development).
D1- The ability to analyze problems related to signals.
D2- Planning and completing laboratory tasks within a specified time.
D3- Using simulation software (such as Multisim) to analyze signals.
C4- Preparing comprehensive and organized laboratory reports.

Course structure .10

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Modulation	Why need Modulation	Discussion method, lecture method	Daily oral test
Second	2 hours	Modulation	What is amplitude modulation AM frequency specter	Discussion method, lecture method	Daily oral test
Third	2 hours	Amplitude modulation	Amplitude modulation bandwidth	Discussion method, lecture method	Daily oral test
Fourth	2 hours	Amplitude modulation	AM-Power distributions	Discussion method, lecture method	Daily oral test
Fifth	2 hours	Amplitude modulation	AM Demodulation (Detection)	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Amplitude modulation	AM Demodulation (Detection)	Discussion method, lecture method	Daily oral test
Seventh	2 hours	Amplitude modulation	AM transmitter	Discussion method, lecture method	Daily oral test
Eighth	2 hours	ANGLE MODULATION	What is frequency modulation	Discussion method, lecture method	Daily oral test
Ninth	2 hours	ANGLE MODULATION	Frequency modulation bandwidth	Discussion method, lecture method	Daily oral test
Tenth	2 hours	ANGLE MODULATION	Frequency modulation frequency specter	Discussion method, lecture method	Daily oral test
Eleventh	2 hours	ANGLE MODULATION	Frequency modulation, Transmitter and detection	Discussion method, lecture method	Daily oral test
Twelfth	2 hours	ANGLE MODULATION	Phase modulation	Discussion method, lecture method	Daily oral test
Thirteenth	2 hours	ANGLE MODULATION	Phase modulation	Discussion method, lecture method	Daily oral test
Fourteenth	2 hours	ANGLE MODULATION	Phase modulation	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	ANGLE MODULATION	Phase modulation	Discussion method, lecture method	Daily oral test

□□□ Structure Infrastructure

1- Books The reporter Required	1- Signals and Systems | Simon Haykin 2- **Kennedy's Electronic Communication Systems Fifth Edition** 3- **Modern Digital and Analog Communication Systems,**

	International Fourth Edition **B. P. Lathi, Professor Emeritus**
2- the reviewer Home (Sources)	• Teacher's binder and the course instructor's YouTube channel
A Books References that Recommended With it (Magazines Scientific , reports ,....)	
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
-1 Updating the course content to keep pace with recent developments in the field of communications. .2Linking theoretical concepts to industrial and real-life applications. .3Updating examples and applications to include modern communications technologies. 4. Preparing advanced and additional content.

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies
3. Course Name/Code	Digital Communications / ETEC206
4. Available Attendance Formats	Second-year students/Second course
5. Semester/Year	second semester/2026
6. Number of Class Hours (Total)	2 hours per week for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025

- Course Objectives

• Understand the basic principles of pulsed communications
• The difference between analog and digital communications
• Study basic concepts such as sampling, quantization, and encoding
• Distinguish between types of pulse modulation such as PAM, PWM, and PPM
• Study the characteristics of each type of modulation
• Learn about time division multiplexing (TDM) and pulse code modulation (PCM) techniques
• Study types of pulse modulation such as pulse amplitude modulation (PAM)• Provide students with practical skills and develop their ability to use devices such as oscilloscopes and frequency generators.
• Link theoretical knowledge to practical applications.
•

10 . Course Outcomes, Teaching and Learning Methods, and Assessment

Teaching and Learning Methods: These include discussion, lecture, and practical aspects, as follows:

1. Self-learning, which includes reading lectures and pre-assigned books, and watching educational videos, especially the instructor's YouTube channel on pulsed communications, to understand practical applications.
2. Experiential Learning: Such as conducting experiments in the lab, such as giving the student a specific problem and assuming they find a scientific explanation.
3. Teaching Methods by the Instructor: These include theoretical lectures and include the following:
1. Explaining basic principles in a gradual manner, from simple to complex.
2. Using illustrations and diagrams to facilitate understanding.
3. Using visual aids such as PowerPoint and Simulink to explain pulsed phenomena.
4. Asking questions during the lecture to encourage thinking and analysis.
5. Holding open discussions to clarify applied concepts.
6. Assigning students weekly problems.

Evaluation Methods: Daily exams, semester exams, and final exam.

A- Cognitive Objectives

- The student will understand the basic concepts of digital communication systems.
- List the types of pulse modulation (PAM, PWM, PPM, PCM).
- The student will explain how pulses are generated and received in a communication system.
- Explain the difference between different modulation techniques.

B - Course Skill Objectives.

- • B1 - The student will be able to use an oscilloscope and a signal generator to measure and analyze pulse signals.
- B2 - Conduct practical experiments.
- B3 - Conduct experiments on pulse modulation systems such as PAM, PWM, and PCM.
- B4 - The student will use programs such as Multisim to simulate pulsed communication systems.
- B5 - Write structured laboratory reports containing measurement results, graphs, analysis, and final notes.

C- Affective and Value-Based Objectives

- C1- The student must demonstrate interest in attending lectures and labs related to the course.
- C2- The student must be focused during lectures and class discussions.
- C3- The student must ask questions and demonstrate a desire to learn complex concepts.
- C4- The student must be committed to submitting reports and assignments on time.
- C5- The student must be responsible while conducting experiments, maintain proper equipment, and respect safety rules in the lab.
- C6- The student must cooperate positively with his or her colleagues while conducting experiments.

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

D1- The ability to analyze signal-related problems.
D2- Plan and complete laboratory tasks within a specified timeframe.
D3- Familiarity with the basics of using simulation software (such as Simulink).
D4- Prepare comprehensive and organized laboratory reports.
D5- The ability to present and present experimental results clearly and organizedly, using correct language and a precise methodology.
D6- Adhere to deadlines for submitting assignments and reports.

10 .Course structure

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Modulation	ANGLE MODULATION	Discussion method, lecture method	Daily oral test
Second	2 hours	Modulation	Receiver	Discussion method, lecture method	Daily oral test
Third	2 hours	Amplitude modulation	Discriminator	Discussion method, lecture method	Daily oral test
Fourth	2 hours	Amplitude modulation	Phase Modulation (Ph. M)	Discussion method, lecture method	Daily oral test
Fifth	2 hours	Amplitude modulation	Pulse Modulation (PM)	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Amplitude modulation	Sampling theorem	Discussion method, lecture method	Daily oral test
Seventh	2 hours	Amplitude modulation	Pulse Modulation	Discussion method, lecture method	Daily oral test
Eighth	2 hours	ANGLE MODULATION	Pulse amplitude modulation	Discussion method, lecture method	Daily oral test
Ninth	2 hours	ANGLE MODULATION	Pulse amplitude modulation	Discussion method, lecture method	Daily oral test
Tenth	2 hours	ANGLE MODULATION	Pulse amplitude modulation	Discussion method, lecture method	Daily oral test
Eleventh	2 hours	ANGLE MODULATION	Pulse Code Modulation	Discussion method, lecture method	Daily oral test
Twelfth	2 hours	ANGLE MODULATION	Pulse Code Modulation	Discussion method, lecture method	Daily oral test
Thirteenth	2 hours	Coding	Coding process	Discussion method, lecture method	Daily oral test
Fourteenth	2 hours	MULTIPLEXING	-Types of multiplex -Frequency division multiplexing (FDM)	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	MULTIPLEXING	Time division multiplexing (TDM)	Discussion method, lecture method	Daily oral test

□□□ Structure Infrastructure

1- Books The reporter Required	• الكتب المقررة: - **Signals and Systems | Simon Haykin** - Principles of Communication Systems Simulation

	with Wireless Applications - Modern Digital and Analog Communication Systems, International Fourth Edition B. P. Lathi, Professor Emeritus
2- the reviewer Home (Sources)	• Teacher's binder and the course instructor's YouTube channel
A Books References that Recommended With it (Magazines Scientific , reports ,....)	
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
1-Updating the course content to keep pace with recent developments in the field of communications. 2. Linking theoretical concepts to industrial and real-life applications. 3. Updating examples and applications to include modern communications technologies. 4. Preparing advanced and additional content.

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies
3. Course Name/Code	**Programmable Logic Controller (PLC)**/ETMI214
4. Available Attendance Formats	Second-year students/Second course
5. Semester/Year	second semester/2026
6. Number of Class Hours (Total)	2 hours per week for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025
• Course Objectives • Learn about Programmable Logic Controllers (PLCs) and how to handle and program them.	

10 . Course Outcomes, Teaching and Learning Methods, and Assessment

Teaching and Learning Methods: These include discussion, lecture, and practical aspects, as follows: Learning and teaching method: Theoretical lectures, practical lectures, workshops, solving examples, graduation project, summer training. Evaluation method: Oral exams, written exams, weekly reports, daily attendance, midterm and final exams.
A- Cognitive Objectives A1- To learn about the components of programmable logic controllers and their importance in industry. A2- To program these logic controllers.
B - Course Skill Objectives. B1 - Ability to manage work B2 - Ability to solve problems on the job site and necessary in this field.
C- Affective and Value-Based Objectives C1- Performing duties at the workplace fairly and with professional motivation.
D - General and transferable skills (other skills related to employability and personal development). D1- Improving their discussion skills D2- Raising their research awareness and transitioning students from teaching to learning.

10 .Course structure

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Knowledge and Practical Application	Introduction	Discussion method, lecture method	Daily oral test
Second Third	2 hours	Knowledge and Practical Application	Sensors with a programmable controller (temperature, pressure, motion, etc.)	Discussion method, lecture method	Daily oral test
	2 hours	Knowledge and Practical Application		Discussion method, lecture method	Daily oral test
Fourth	2 hours	Knowledge and Practical Application	Electrical switch, electrical connection	Discussion method, lecture method	Daily oral test
Fifth	2 hours	Knowledge and Practical Application	Introduction to Ladder Language	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Knowledge and Practical Application	AND, OR, NOT, etc. using Ladder Language	Discussion method, lecture method	Daily oral test
Seventh	2 hours	Knowledge and Practical Application	Timers and their types - Simulation using Ladder Language	Discussion method, lecture method	Daily oral test
Eighth	2 hours	Knowledge and Practical Application	Signals in Ladder Language	Discussion method, lecture method	Daily oral test
Ninth	2 hours	Knowledge and Practical Application	Counters and their types with examples	Discussion method, lecture method	Daily oral test
Tenth	2 hours	Knowledge and Practical Application	Example of a (conversion circuit) using ladder language	Discussion method, lecture method	Daily oral test
Eleventh	2 hours	Knowledge and Practical Application	Single-phase motor starter circuit	Discussion method, lecture method	Daily oral test
Twelfth	2 hours	Knowledge and Practical Application	Motor starter using ladder language	Discussion method, lecture method	Daily oral test
Thirteenth	2 hours	Knowledge and Practical Application	Three-phase motor starter circuit	Discussion method, lecture method	Daily oral test
Fourteenth	2 hours	Knowledge and Practical Application	Example of opening and closing a door using a motion sensor	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	Knowledge and Practical Application	Example of measuring the water level in a tank	Discussion method, lecture method	Daily oral test

□□□ Structure Infrastructure

1- Books The reporter Required	Available free of charge in the department and institute library.

2- the reviewer Home (Sources)	Available free of charge in the department and institute library.
A Books References that Recommended With it (Magazines Scientific , reports ,....)	Practical Control Principles for Electrical Engineers by Professor Ali Al-Bakri
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
• Developing curricula that are appropriate for the labor market.- Holding scientific seminars and conferences aimed at updating curricula. • • Monitoring scientific developments in the field of specialization.

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies
3. Course Name/Code	Microprocessor Programming / ETEC205
4. Available Attendance Formats	Second-year students / Second course / Mandatory attendance
5. Semester/Year	Second semester / 2026 AD
6. Number of Class Hours (Total)	4 hours per week (2 theoretical + 2 practical) for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025

- Course Objectives

• 8086 Assembly Language Proficiency: Students must be able to write and understand programs in 8086 assembly language, including the use of various commands, subroutines, and control functions.

• Interacting with External Devices: Students must learn how to use input and output interfaces to connect to external devices, such as keyboards, mice, and monitors.

• Problem Solving Using Programming: Students must be able to use their programming skills to solve various problems, both simple and complex.

• Developing Low-Level Programming Skills: The course aims to develop students' low-level programming skills, helping them better understand how computers work.

• Compatibility with Modern Processors: Since the 8086 processor is the foundation of modern x86 processors, understanding it helps students better understand newer processors, as many of the basic concepts and principles are still in use..

10 . Course Outcomes, Teaching and Learning Methods, and Assessment

Teaching and Learning Methods: These include discussion, lecture, and practical aspects, as follows:

Learning and teaching method: Theoretical lectures, practical lectures, workshops, solving examples, graduation project, summer training. Evaluation method: Oral exams, written exams, weekly reports, daily attendance, midterm and final exams.

A- Cognitive Objectives

• Understand the architecture of the 8086 processor and the functions of its basic components.

• Identify and use the 8086 instruction set.

• Understand how to manipulate memory and program processing.

• Identify techniques for programming the processor..

B - Course Skill Objectives.

• The ability to program the 8086 processor using assembly language.

• The ability to write programs that enable data processing and memory configuration.

• Develop skills in diagnosing and debugging 8086 programs.

• Implement simple and advanced programs that require memory management and input/output handling.

• Improve skills in using development and simulation tools specific to 8086 processors..

C- Affective and Value-Based Objectives

• Encourage students' interest in technology and low-level programming.

• Develop a love of exploration and continuous learning in the field of microprocessor systems.

• Encourage students to develop systematic problem-solving and analysis skills.

• Instill the value of precision and discipline in writing and programming instructions.

• Enhance self-confidence in their ability to program and control microprocessors.

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

1. Basic Technological Skills

• Proficiency in the use of computer tools, simulation, and development software.

• Understanding the basics of operating systems and low-level programming.

2. Organizational and Time Management Skills

• Ability to organize data and software projects systematically.

• Efficiently manage time to complete tasks within the specified deadlines, especially in programming projects.

3. Self-Learning Skills

• Ability to continuously learn and keep up with technological developments in the field of processors and programming.

• Continuously seek information and develop one's skills through various sources.

4. Professional Development Skills

• Ability to evaluate personal performance and identify areas for improvement.

• Thinking about developing technical and professional skills to keep pace with labor market requirements.

10 .Course structure

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Knowledge and Practical Application	General explanation of the 8086 processor	Discussion method, lecture method	Daily oral test
Second	2 hours	Knowledge and Practical Application	Load instructions in the 8086 processor (MOV, XCHG, LEA) Load instructions in the 8086 processor	Discussion method, lecture method	Daily oral test
Third	2 hours	Knowledge and Practical Application	(PUSH, POP) with an explanation of the stack	Discussion method, lecture method	Daily oral test
Fourth	2 hours	Knowledge and Practical Application	Arithmetic instructions in the 8086 processor	Discussion method, lecture method	Daily oral test
Fifth	2 hours	Knowledge and Practical Application	Solving programs on transfer and arithmetic instructions.	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Knowledge and Practical Application	Logical instructions in the 8086 processor (AND, OR, XOR, NOT, TEST).	Discussion method, lecture method	Daily oral test
Seventh	2 hours	Knowledge and Practical Application	Shift instructions in the 8086 processor (SAL, SHL, SHR, SAR). With solved examples.	Discussion method, lecture method	Daily oral test
Eighth	2 hours	Knowledge and Practical Application	Rotation instructions in the 8086 processor (ROL, ROR, RCL, RCR). With solved examples.	Discussion method, lecture method	Daily oral test
Ninth	2 hours	Knowledge and Practical Application	Unconditional Jump Instructions An explanation of the types of unconditional jump instructions with examples. Counters	Discussion method, lecture method	Daily oral test
Tenth	2 hours	Knowledge and Practical Application	Conditional Jump Instructions. An explanation of the types of conditional jump instructions with	Discussion method, lecture method	Daily oral test

			examples.		
Eleventh	2 hours	Knowledge and Practical Application	(Upward counters, Downward counters, Downward counters).	Discussion method, lecture method	Daily oral test
Twelfth	2 hours	Knowledge and Practical Application	Loop Instructions	Discussion method, lecture method	Daily oral test
Thirteenth	2 hours	Knowledge and Practical Application	Media register instructions with examples	Discussion method, lecture method	Daily oral test
Fourteenth	2 hours	Knowledge and Practical Application	Subroutine instructions (CALL, RET) with examples.	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	Knowledge and Practical Application	String instructions	Discussion method, lecture method	Daily oral test

□□□ Structure Infrastructure	
1- Books The reporter Required	1- "Intel Microprocessors 8086/8088: Architecture, Programming, and Design" , Barry B. Brey 2- "Assembly Language for x86 Processors" , Kip R. Irvine 3- "Microprocessor Architecture, Programming, and Applications with the 8085/8086" , Ramesh S. Gaonkar 4- "The Intel 8086/8088 Microprocessors: Programming, Interfacing, and Troubleshooting", Hamacher, Zvonko G. Vranesic, Zaky .
2- the reviewer Home (Sources)	• Course instructor lectures • Course instructor YouTube channel.
A Books References that Recommended With it (Magazines Scientific , reports ,....)	
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
•Integrating low-level programming concepts with modern programming techniques.

•Linking theoretical concepts with modern practical and operational applications.

•Holding workshops with industry experts.

•Developing graduation projects based on real-world applications.

• Organizing field visits to companies specializing in the development of embedded systems and control systems.

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies
3. Course Name/Code	Multimedia Communications
4. Available Attendance Formats	Second-year students / Second course / Mandatory attendance
5. Semester/Year	Second semester / 2026 AD
6. Number of Class Hours (Total)	4 hours per week (2 theoretical + 2 practical) for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025

- Course Objectives

• Learn about multimedia, its types, and the system components for multimedia communications.

• Learn about multimedia transmission media and their types.

• Learn about wired media carriers.

• Learn about wireless media carriers.

• Learn about multimedia networks, their types, and the axes of interaction with them.

• Learn about the OSI protocol and its layers.

• Learn about the TCP/IP protocol and its layers.

• IP addresses and their classifications, and design a network for a group of devices.

10. Course Outcomes, Teaching and Learning Methods, and Assessment

Teaching and Learning Methods: These include discussion, lecture, and practical aspects, as follows:

Learning and teaching method: Theoretical lectures, practical lectures, workshops, solving examples, graduation project, summer training. Evaluation method: Oral exams, written exams, weekly reports, daily attendance, midterm and final exams.

A- Cognitive Objectives

1.Understand the concept of multimedia and its various types, along with identifying the components of a multimedia communication system.

2. Distinguish between multimedia transmission media and understand the characteristics of each type.

3. Understand the workings of wired transmission media and their uses in data transmission. 4. Understand wireless media and how they are used in different data transmission environments. 5. Understand the networks used to transmit multimedia, their different types, and the axes used to deal with them. 6. Review the OSI model and its seven layers, and its role in organizing network communication. 7. Understand the TCP/IP model and its layers, and how it is used in computer networks. 8. Understand the concept of IP addressing, its classifications, and how to design a network containing multiple devices accordingly.
B - Course Skill Objectives. 1. Distinguish between multimedia types and apply the skills necessary to select the most appropriate type in different contexts. 2. Analyze the components of a multimedia communication system and build simplified models to understand the communication mechanism between these components. 3. Use wired and wireless transmission media effectively in network environments, with the ability to evaluate the advantages and disadvantages of each type. 4. Design multimedia transmission networks to meet performance and quality of service requirements. 5. Map the OSI and TCP/IP model layers, explain their functions in a network environment, and relate them to real-life applications. 6. Design effective IP addressing and distribute it to devices within the network, taking into account different classifications and technical needs.
C- Affective and Value-Based Objective 1.Appreciating the importance of multimedia in facilitating communication and information transfer in the digital age. 2. Developing a positive attitude toward the use of modern networks in learning and work environments. 3. Enhancing a sense of technical responsibility when handling data over wired and wireless networks. 4. Respecting the rules and ethics of dealing with communications systems and appreciating the role of protocols in protecting data and ensuring communication integrity.
D - General and transferable skills (other skills related to employability and personal development). 1-The ability to solve technical problems using analytical and logical thinking in real-life situations related to networks and multimedia. 2. Develop scientific research and self-learning skills by tracking and using technical resources to understand advanced concepts. 3. Acquire effective communication skills in teamwork environments, particularly in network design projects or preparing technical presentations. 4. Enhance computer skills and applications, particularly those related to network analysis tools or multimedia simulation.

10 .Course structure

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Knowledge and Practical Application	Course Introduction	Discussion method, lecture method	Daily oral test
Second	2 hours	Knowledge and Practical Application	- Definition of multimedia and its type - Components of a multimedia communication system - Multimedia transmission medium and its types according to transmissions	Discussion method, lecture method	Daily oral test
Third					
Fourth	2 hours			Discussion method, lecture method	Daily oral test
		Knowledge and Practical Application	Wire transmission - media and their types Dual lines, coaxial) cable, optical cable) Transmission modes in - multimedia communications Types of noise - affecting multimedia signals Transmission problems - and solutions		
	2 hours	Knowledge and Practical Application		Discussion method, lecture method	Daily oral test
Fifth	2 hours	Knowledge and Practical Application	-Wireless transmission media, their types, applications, advantages, and disadvantages -Electromagnetic spectrum (frequency spectra)	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Knowledge and Practical Application		Discussion method, lecture method	Daily oral test
Seventh	2 hours	Knowledge and Practical Application	Bluetooth technology	Discussion method, lecture method	Daily oral test
Eighth	2 hours	Knowledge and Practical Application	Wi-Fi technology and the types of networks used in Wi-Fi Wi-Fi Max technology	Discussion method, lecture method	Daily oral test
Ninth	2 hours	Knowledge and Practical Application	-Definition of a network -Types of networks in multimedia in terms of	Discussion method, lecture method	Daily oral test
Tenth	2 hours	Knowledge and Practical Application		Discussion	Daily oral test

			size and shape (their advantages and disadvantages) -Network components	method, lecture method	
Eleventh	2 hours	Knowledge and Practical Application	OSI Protocol and its Layers	Discussion method, lecture method	Daily oral test
Twelfth	2 hours	Knowledge and Practical Application	TCP/IP Protocol and its Layers	Discussion method, lecture method	Daily oral test
Thirteenth	2 hours	Knowledge and Practical Application	IP Address, Classifications, and Subnet Mask	Discussion method, lecture method	Daily oral test
Fourteenth	2 hours	Knowledge and Practical Application	Network Design Using IP Addresses	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	Knowledge and Practical Application	Network Design Examples and General Review	Discussion method, lecture method	Daily oral test

□□□ Structure Infrastructure	
1- Books The reporter Required	
2- the reviewer Home (Sources)	• Course instructor lectures • Course instructor YouTube channel.
A Books References that Recommended With it (Magazines Scientific , reports ,....)	
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
• Updating content to keep pace with technological developments. • Enhancing practicality through activities and projects. • Diversifying teaching and assessment methods to enhance learning efficiency.

1. Educational Institution	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Electronics and Communications Technologies

3. Course Name/Code	multimedia devices
4. Available Attendance Formats	Second-year students / Second course / Mandatory attendance
5. Semester/Year	Second semester / 2026 AD
6. Number of Class Hours (Total)	4 hours per week (2 theoretical + 2 practical) for 15 weeks (semester)
7. Date this Description Was Prepared	1 – 9 - 2025

- Course Objectives

This course aims to provide students with basic theoretical knowledge and practical skills in the field of networks and communications, enabling them to understand network components, connection methods, operating network devices, setting up small networks, and connecting various devices, including surveillance cameras.

10. Course Outcomes, Teaching and Learning Methods, and Assessment

Teaching and Learning Methods: These include discussion, lecture, and practical aspects, as follows:

Learning and teaching method: Theoretical lectures, practical lectures, workshops, solving examples, graduation project, summer training. Evaluation method: Oral exams, written exams, weekly reports, daily attendance, midterm and final exams.

A- Cognitive Objectives

• Explain basic network concepts

• Distinguish different types of networks

• Describe network topology

• Understand network components

B - Course Skill Objectives.

1- Design a simple network

2- Connect cables

3- Set up a router or switch practical

C- Affective and Value-Based Objective

1- Introducing students to computer networks and how to connect them.

2- The ability to develop and enhance students' existing skills and employ them to help them in their practical lives.

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

10 .Course structure

The week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
First	2 hours	Knowledge and Practical Application	Introduction to Networks and Communications	Discussion method, lecture method	Daily oral test
Second	2 hours	Knowledge and Practical Application	Types of Networks (LAN, MAN, WAN, WLAN, PAN) The Differences Between Them Practical Examples of Each Type	Discussion method, lecture method	Daily oral test
Third	2 hours	Knowledge and Practical Application	Network Topology Bus, Star, Ring, Mesh, Hybrid	Discussion method, lecture method	Daily oral test
Fourth	2 hours	Knowledge and Practical Application	Types of cables used in networks UTP, STP, Coaxial, Fiber Optic	Discussion method, lecture method	Daily oral test
Fifth	2 hours	Knowledge and Practical Application	Types of Inspection Connectors RJ45, USB, VGA, HDMI, BNC Inspection Components and Installation	Discussion method, lecture method	Daily oral test
Sixth	2 hours	Knowledge and Practical Application	RJ45 Installation Method Wire Arrangement (Straight vs. Crossover)	Discussion method, lecture method	Daily oral test
Seventh	2 hours	Knowledge and Practical Application	Router Its primary function The difference between a home router and a business router	Discussion method, lecture method	Daily oral test
Eighth	2 hours	Knowledge and Practical Application	Switch and Hub The difference between them	Discussion method, lecture method	Daily oral test
Ninth	2 hours	Knowledge and Practical Application	Access Point, Bridge, and Repeater	Discussion method,	Daily oral test

				lecture method	
Tenth	2 hours	Knowledge and Practical Application	Designing a Home or Small Office Network	Discussion method, lecture method	Daily oral test
Eleventh	2 hours	Knowledge and Practical Application	Manual IP Address Setup and Configuration and DHCP Static vs. Dynamic IP Subnetting in Brief	Discussion method, lecture method	Daily oral test
Twelfth	2 hours	Knowledge and Practical Application	Connecting IP Cameras to the Network Types of Surveillance Cameras Steps for Connecting a Camera via a Router or Switch	Discussion method, lecture method	Daily oral test
Thirteenth	2 hours	Knowledge and Practical Application	Network Security Firewalls Data Encryption (WEP, WPA, WPA2	Discussion method, lecture method	Daily oral test
Fourteenth	2 hours	Knowledge and Practical Application	Network Monitoring and Management Network Management Tools (e.g., Wireshark, Fing)	Discussion method, lecture method	Daily oral test
Fifteenth	2 hours	Knowledge and Practical Application		Discussion method, lecture method	Daily oral test

□□□ Structure Infrastructure	
1- Books The reporter Required	
2- the reviewer Home (Sources)	• Course instructor lectures • Course instructor YouTube channel.
A Books References that Recommended With it (Magazines Scientific , reports ,....)	Networking (Mohamed Abdel Qader Mohamed)
for - the reviewer Electronic, Sites The Internet	Internet

12.Plan Curriculum Development
Updating the course to keep pace with the rapid development in modern networking technologies.