Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

Department of Networks and Computer Software Techniques

2026-2025

University Name: **Northern Technical University**

Faculty/Institute: / Technical Institute of Mosul

Scientific Department: Networks and Computer Software Techniques

Academic or Professional Program Name: Diploma of Networks and Computer Software Techniques

Final Certificate Name: Diploma of Networks and Computer Software Techniques

Academic System: Semesters

Description Preparation Date: **1/03/2026**

File Completion Date: **12/04/2026**

Signature:

Head of Department Name:

Dr. Shatha A. Baker

Date:**12/04/2026**

Signature:

Scientific Associate Name:

Dr. Hassan M.Qassim

Date:**12/04/2026**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

University Name: Northern Technical University

Faculty/Institute: / Technical Institute of Mosul

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Signature:

A.N

Approval of the Dean

1-Program vision:
Leadership and excellence in the field of information technology and computer networks, while achieving a positive impact at the level of Iraq and the region. The department seeks to provide the community with effective energies in network systems, and to develop their abilities to interact and communicate in the information society.

2-Program message:
We seek to provide distinguished education in the field of computer networks, compatible with international standards, while producing innovative research that supports higher education and providing technical advice to enhance the level of community performance.

3- Program objectives
1. Preparing scientifically and practically qualified cadres commensurate with the requirements of the labor market and development needs.
2. Continuously develop curricula at the level of undergraduate and postgraduate studies, in line with technical and cognitive innovations.
3. Strengthening ties with the corresponding departments in regional and international universities and academic institutions, and positively interacting with their successful experiences.
4. Participate in community service through continuous interaction

4-Program accreditation:
nothing

5-Other external influences:

nothing

6- Program structure: First Level				
Program Structure	Number of Courses	Study Unit	Percentage	Notes *
University requirements	6	10	18%	4 Essential 2 optional
Institute requirements	4	10	18%	4 Essential
Department requirements	8	40	64%	8 Essential
summer training	3	completed	_____	
Other	/	There isn't any		
Program structure: Second Level				
Program Structure	Number of Courses	Study Unit	Percentage	Notes *
University requirements	5	10	18%	5Essential
Institute requirements	4	9	17%	4 Essential
Department requirements	7	35	65%	7 Essential
Other	/	There isn't any		

7- Program description				
Year/level	**Course or course code**	**Name of the course or course**	**Hours**	
2025-2024/First	**NTU 100**	**Democracy & Human Rights**	**Theory**	**Practice**
	NTU 101	**English Language**	**2**	**2**
	NTU 102	**The computer**	**0**	**0**
	NTU 103	**Arabic Language**	**2**	**2**
	NTU 104	**Sport**	**0**	**0**
	NTU 106	**French Language**	**1**	**1**
	MTI 100	**Mathematics**	**1**	**1**
	MTI 101	**Mechanical Workshop**	**2**	**2**
	MTI 102	**Engineering Drawing**	**0**	**0**
	MTI 103	**Calculus**	**1**	**1**
	CPN100	**Programming in C++**	**1**	**1**
	CPN101	**Python Programing**	**2**	**2**
	CPN102	**Computer Architecture**	**0**	**0**
	CPN103	**Computer Organization**	**2**	**2**

	CPN104	Principles of Electronics	0	0
	CPN105	Computer Networks	0	0
	CPN106	Principles of Electrical Engineering	3	3
	CPN107	Internet of Things	0	0
2026-2025/Second	NTU200	English Language	2	-
	NTU201	The computer	1	1
	NTU202	Arabic Language	2	-
	NTU203	The crimes of Baath in regime in Iraq	2	-
	NTU204	Professional ethics	2	-
	MTI200	Research project	-	2
	MTI201	Specialized Workshop	-	3
	MTI202	Applied Project	-	2
	MTI203	Vocational Safety	2	-
	CPN200	Databases in SQL	2	3
	CPN201	CryptographyAnd Computer Security	2	3
	CPN202	Networks Management	2	3
	CPN203	Electronic Web Design	2	3
	CPN204	Web Site programming	2	3
	CPN205	Visual Basic Programming	2	3
	CPN206	Operating systems	2	3

8- Expected learning outcomes of the programme

A Knowledge:

1. ,comprehend concepts of computer and peripheral maintenance, and develop the ability to diagnose malfunctions and repair devices.

2. Understand the role of programming languages, algorithms, and data structures in solving computational problems; possess fundamental knowledge of databases and be familiar with relational database design.

3. Comprehend the structure of networks, their types, protocols, and communication mechanisms among devices; be familiar with concepts such as IP addressing, TCP/IP, DNS, DHCP, and understand the foundational infrastructure of the Internet of Things (IoT).

4. Apply mathematical concepts to solve problems related to technical disciplines.

5. Understand the principles of cybersecurity, identify security threats, and be familiar with protection methods, encryption techniques, and firewalls.

6. Possess foundational knowledge in programming and developing web and mobile applications; be familiar with front-end and back-end development technologies.

7. Develop the ability to write technical texts and reports in both correct and proper Arabic and English.

B Skills

1. Demonstrate the ability to assemble and maintain computer systems, including performing high-skill tasks in assembling, testing, diagnosing, and regularly servicing computers and their peripherals.

2. Develop effective software solutions using appropriate programming languages by designing efficient algorithms, creating applications that meet specific requirements, and designing and developing relational databases.

3. Design Local Area Networks (LANs) and configure them using suitable tools and software.

4. Develop responsive user interfaces using HTML, CSS, and JavaScript; create simple mobile applications using environments such as Android Studio or Flutter.

5. Implement security measures on systems and networks, such as setting up firewalls and configuring antivirus tools.

6. Evaluate and analyze programming or networking problems, identify their causes, and apply critical thinking to solve them.

7. Demonstrate proficiency in using Integrated Development Environments (IDEs), network simulation tools (such as Cisco Packet Tracer), and software project management systems.

C Value
1. Adhere to professional ethics and integrity when dealing with systems and information, respecting privacy and maintaining data confidentiality in network and software contexts. 2. Promote secure behavior in the use of digital systems and foster a culture of protection against cyber threats and attacks. 3. Commit to applying quality standards in code writing, project documentation, and computer network implementation. 4. Demonstrate the ability to work effectively within multidisciplinary teams during software development or network setup projects.

9-Teaching and learning strategies

The teacher explains the theoretical material on the blackboard using a slide projector, paper lectures, educational packages, and methodological and summer training in hospitals.

10-Evaluation methods

Daily, quarterly and final tests, submitting weekly reports

11-The teaching staff

Faculty members

Academic rank	Specialization		Special requirements/skills (if any)		preparation of the teaching staff	
	general	Specialized			lecturer	staff
Professor	Electrical Engineering	Communications Engineering			Staff	
Assistant Professor	computer science	Intelligent Technologies			Staff	
Assistant Professor					Staff	
Assistant Professor					Staff	

Assistant lecturer	Computer science and mathematics	Software			Staff
Assistant lecturer	computer engineering technology	Computer Graphics			staff
Assistant lecturer	Computer Science	Information Systems			staff
Assistant lecturer	Computer Engineering Technology	Computer Engineering Technology			staff
Assistant lecturer	Computer Science	Intelligent Techniques			staff

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

13-Acceptance criterion
- The student's admission criterion is determined according to the central admission plan within the plan of the Ministry and the student's preparatory branch, his grade point average and his desire. After that, the student is interviewed in a special interview at the institute

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- Adding information on all topics related to Network and Programming Languages. 2- Learn about recent scientific developments.

3- Participation in international and local conferences.
4- Participation in scientific workshops inside and outside Iraq.
5-Hosting scientific competencies in the field of specialization

First Level						
Code	No. Units	No. Hours of Practice	No. Hours of Theory	Course name		Requirement Type
				English Language	Arabic Language	
NTU 100	2	0	2	Democracy & Human Rights	الديمقراطية وحقوق الانسان	University %(15-10)
NTU 101	2	0	2	English Language	اللغة الانكليزية	
NTU 102	2	1	1	The computer	الحاسوب	
NTU 103	2	0	2	Arabic Language	اللغة العربية	
NTU 104	2	1	1	Sport	الرياضة (اختياري)	
NTU 106	2	0	2	French Language	اللغة الفرنسية(اختياري)	
	10	Total university units required				
MTI 100	2	0	2	Mathematics	الرياضيات	Institute %(22-16)
MTI 101	3	3	0	Mechanical Workshop	معامل ميكانيك	
MTI 102	3	3	0	Engineering Drawing	رسم هندسي	
MTI 103	2	0	2	Calculus	تفاضل و تكامل	
	10	Total institute units required				
CPN100	5	3	2	Programming in C++	C++ البرمجة بلغة	Department %(74-63)
CPN101	5	3	2	Python Programing	برمجة بايثون	
CPN102	5	3	2	Computer Architecture	معمارية الحاسوب	
CPN103	5	3	2	Computer Organization	تركيب حاسبة	
CPN104	5	3	2	Principles of Electronics	مبادئ الالكترونيك	
CPN105	5	3	2	Computer Networks	اساسيات شبكات الحاسوب	

CPN106	5	3	2	Principles of Electrical Engineering	مبادئ الهندسة الكهربائية	
CPN107	5	3	2	Internet of Things	انترنيت الاشياء	
	40	Total Department units required				
	60	32	28	Total Units		

Department of Networks and Computer Software Techniques/Second Level

Second Level						
Code	No. Units	No. Hours of Practice	No. Hours of Theory	Course name		Requirement Type
				English Language	Arabic Language	
NTU200	2	-	2	English Language	اللغة الانكليزية	University %(15-10)
NTU201	2	1	1	The computer	الحاسوب	
NTU202	2	-	2	Arabic Language	اللغة العربية	
NTU203	2	-	2	The crimes of Baath in regime in Iraq	جرائم حزب البعث في العراق	
NTU204	2	-	2	Professional ethics	اخلاقيات المهنة	
	10	Total university units required				
MTI200	2	2	-	Research project	مشروع بحث	Institute %(22-16)
MTI201	3	3	-	Specialized Workshop	ورشة تخصصيه	
MTI202	2	2	-	Applied Project	مشروع تطبيقي	
MTI203	2	-	2	Vocational Safety	السلامة المهنية	
	9	Total institute units required				
CPN200	5	3	2	Databases in SQL	قواعد بيانات SQL	Department %(74-36)

CPN201	**5**	**3**	**2**	**Cryptography And Computer Security**	**التشفير وامنية الحاسوب**	
CPN202	**5**	**3**	**2**	**Networks Management**	**إدارة الشبكات**	
CPN203	**5**	**3**	**2**	**Electronic Web Design**	**تصميم المواقع الالكترونية**	
CPN204	**5**	**3**	**2**	**Web Site programming**	**برمجة مواقع Web**	
CPN205	**5**	**3**	**2**	**Visual Basic Programming**	**البرمجة بلغة V.B**	
CPN206	**5**	**3**	**2**	**Operating systems**	**انظمة تشغيل**	
	35	**Total Department units required**				
	54			**Total Units**		

1. Educational institution	Northern Technical university
2. Section Scientific / Center	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Name the program Academic or Professional	Department of Networks and Computer Software Techniques
4. name Certificate Final	Technical Diploma
5. order Academic : annual /Courses /Other	Course-based

6. program Accreditation Certified	(ABET)
7. Effects Foreign Other	There is a close relationship with the labor market (public and private sectors) through communication with official and semi-official departments, focusing on the needs required in those departments, where the curricula are updated accordingly.
8. Date of Description Preparation	11/1/2024

9. Goals The program's Academic

- ❖ Aims to Department of Networks And Software Computer Techniques to Graduation Cadres technique Specialized in Areas Calculators and networks And software And the Internet Things And safe Information And knowledge Dealing with Devices Electronic Modern And control With it And also Devices Computer In various Its types How to Install it And its programming And run it And then Maintain it.
- ❖ to provide Knowledge Basic in principles network techniques And software computers during the design And implementation of the project laboratory, In addition to the ability to link network computing And processing Problems to speak With it
- ❖ The presentation is wide-ranging, covering problems that arise in Practice, with the job Collective, Safety Professional, Ethics General, and the economy.
- ❖ Qualification Graduate To be Able to Keep up Evolution Fast in Electronics and networks, programming languages, and various computing programs.
- ❖ Setting up Graduate to able He completes His scientific journey By obtaining higher Certificates.

10. Required Program Outcomes and Methods of Teaching, Learning, and Assessment

A- Cognitive Objectives

A1- Providing graduates with the necessary knowledge to manage electronic systems of various types and categories and how to handle and utilize them optimally.

A2- Equipping graduates with the essential knowledge to manage computer systems, including handling and assembling their hardware components.

A3- Providing graduates with fundamental information in computer specialization, starting from selecting the most suitable devices, understanding the basics of operation, and progressing to assembly and maintenance, both software- and hardware-related.

A4- Equipping graduates with the necessary knowledge to manage computer networking systems and understand their key components.

A5- Preparing graduates to enter the job market by enabling them to understand the latest scientific advancements in computing, networking, and modern electronic devices. Additionally, they will be trained to handle modern machinery and rapidly evolving advanced technologies.

B- Program-Specific Skill Objectives

B1 – Providing graduates with essential knowledge about electronic components made from semiconductors, including their various types, manufacturing processes, fundamental properties, functions, and methods of assembling them in different electronic circuits.

B2 – Understanding methods for testing electronic components, obtaining basic electrical signals, and applying this knowledge to various household and personal devices.

B3 – Prepare graduates to solve technical problems in electronics, networks, and computers, perform routine maintenance, analyze failure causes, and find solutions.

B4 – Equipping graduates with fundamental skills to design simple, practical electronic circuits using microcontrollers and programmable logic controllers (PLCs) and integrating computers with machines for automated control.

Methods of Teaching and Learning

1. Theoretical lectures
2. Practical lectures (laboratories)
3. Various types of workshops
4. Audio-visual teaching aids
5. Scientific films
6. Field scientific visits
7. Summer training

Methods of Assessment

1. Quick daily tests (oral and written)
2. Midterm and final exams
3. Homework assignments
4. Daily or weekly practical reports
5. Instant performance evaluation in workshops and laboratories
6. Seminars
7. Outstanding extracurricular activities
8. Graduation project discussions

C- Affective and Value-Based Objectives

C1 - Possesses academic and technical knowledge, experience, and skills in hardware and software computing technologies.

C2 - Is capable of keeping up with rapid advancements in modern electronic devices, including computers, their systems, and networks.

C3 - Is proficient in managing, planning, and executing periodic maintenance, upkeep, and development programs.

C4 - Knowledge and understanding of assembling, operating, and testing practical electronic circuits.

Methods of Teaching and Learning

1. Theoretical lectures
2. Scientific discussions in classrooms
3. Small-group learning method
4. Conducting practical experiments in laboratories
5. Seminars where students present the latest global scientific advancements
6. Preparation for final-year graduation projects
7. Scientific visits to real-world workplaces to observe key challenges and applications in electronic technologies
8. Scientific films and other visual aids
9. Summer training in government departments, factories, and companies
10. Textbooks, library resources, and online scientific references

Methods of Assessment

1. Quick daily tests, homework assignments, midterm and final exams
2. Monitoring scientific activities
3. Daily or weekly practical reports
4. Direct performance evaluations in workshops and laboratories
5. Annual evaluations of both classroom and extracurricular performance
6. Graduation project discussions

D -General and Transferable Skills (Other Skills Related to Employability and Personal Development)

D1- Learning engineering and electrical drawing using AutoCAD.

D2 - Learning how to format and reinstall software on computers.

D3 - Assisting in solving mathematical problems.

D4 - Gaining practical skills essential for daily life, including expertise in carpentry, turning, welding, and other technical fields, while adhering to occupational safety procedures.

Methods of Teaching and Learning

Lectures, laboratories, workshops, field visits, graduation projects, and summer training.

Methods of Assessment

Oral and written tests, midterm and final exams, practical reports, homework assignments, daily evaluations, and monitoring scientific activities.

11.Program Structure

First level	Course Code Theory	Course Name	Credit Hours	
			Theory	Practical
First course	NTU 100	Democracy & Human Rights	2	-
Second course	NTU101	English Language	2	-
First course	NTU102	Computer Basics	1	1
First course	NTU103	ARABIC LANGUAGE	2	–
First course	NTU104	Sport	1	1
Second course	NTU106	French Language	-	2
First course	MTI 100	Mathematics	2	-
Second course	MTI 102	Engineering Drawing	-	2
Second course	MTI 103	Calculus	2	-
First course	CPN100	C++ Programming	2	3
Second course	CPN101	Python Programming	2	3
Second course	CPN102	Computer Architecture	2	3

First course	CPN103	Computer Organization	2	3
Second course	CPN105	Computer Networks	2	3
First course	CPN106	Principles of Electrical Engineering	2	3
First course	CPN107	Internet of Things (IoT)	2	3
Second level	**Course Code Theory**	**Course Name**	**Credit Hours**	
			Theory	**Practical**
	NTU200	**English Language**	**2**	**-**
	NTU201	**The computer**	**1**	**1**
	NTU202	**Arabic Language**	**2**	**-**
	NTU203	**The crimes of Baath in regime in Iraq**	**2**	**-**
	NTU204	**Professional ethics**	**2**	**-**
	MTI200	**Research project**	**-**	**2**
	MTI201	**Specialized Workshop**	**-**	**3**
	MTI202	**Applied Project**	**-**	**2**
	MTI203	**Vocational Safety**	**2**	**-**
	CPN200	**Databases in SQL**	**2**	**3**
	CPN201	**CryptographyAnd Computer Security**	**2**	**3**
	CPN202	**Networks Management**	**2**	**3**
	CPN203	**Electronic Web Design**	**2**	**3**
	CPN204	**Web Site programming**	**2**	**3**
	CPN205	**Visual Basic Programming**	**2**	**3**
	CPN206	**Operating systems**	**2**	**3**

12.Personal Development Planning

1. Educational Supervision
2. Seminars
3. Summer training
4. Scientific trips
5. Study circles
6. Participation in scientific exhibitions
7. Participation in cultural festivals, sports, and scientific competitions

13.Admission Criteria (Regulations for College or Institute Enrollment)

1- Academic average
2- Interest and preference
3- Relevant specialization in vocational high schools.

14.Key Information Sources About the Program

1- Accreditation Program (ABET)
2- Advisory and sectoral committees
3- Departmental development plan
4- Academic experience in education and practical experience within and outside the education sector

Program Skills Outline																							
Year/Level	**Course Code**	**Course Name**	**Essential or Optinal**	**Required program Learning outcomes**																			
				Cognitive Objectives							**Skils Objective**							**Ethics**					
				A1	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**B 1**	**B2**	**B3**	**B 4**	**B 5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**		
First	NTU 100	Democracy & Human Rights	**Essential**	√			√					√	√	√		√	√	√	√	√	√		
	NTU101	English Language	**Essential**	√			√					√	√	√		√	√	√	√	√	√		
	NTU102	Computer	**Essential**	√			√					√	√	√		√	√	√	√	√	√		
	NTU103	**Arabic Language**	**Essential**	√			√					√	√	√		√	√	√	√	√	√		
	NTU 104	**Sport**	**Optional**	√			√					√	√	√		√	√	√	√	√	√		
	NTU106	French Language	**Optional**	√			√					√	√	√		√	√	√	√	√	√		
	MTI 100	Mathematics	**Essential**	√			√					√	√	√		√	√	√	√	√	√		
	MTI 102	Engineering Drawing	**Essential**	√			√					√	√	√		√	√	√	√	√	√		
	MTI 103	Calculus	**Essential**	√			√					√	√	√		√	√	√	√	√	√		

	CPN100	C++ Programming	**Essential**	√			√					√	√	√		√	√	√	√	√	√
	CPN101	Python Programming	**Essential**	√			√					√	√	√		√	√	√	√	√	√
	CPN102	Computer Architecture	**Essential**	√			√					√	√	√		√	√	√	√	√	√
	CPN103	Computer Organization	**Essential**	√			√					√	√	√		√	√	√	√	√	√
	CPN105	Computer Networks	**Essential**	√			√					√	√	√		√	√	√	√	√	√
	CPN 106	**Principle of Electrical Engineering**	**Essential**	√			√					√	√	√		√	√	√	√	√	√
	CPN107	Internet of Things	**Essential**	√			√					√	√	√		√	√	√	√	√	√
Second	**NTU200**	**English Language**	**Essential**																		
	NTU201	**The computer**	**Essential**																		
	NTU202	**Arabic Language**	**Essential**																		
	NTU203	**The crimes of Baath in regime in Iraq**	**Essential**																		
	NTU204	**Professional ethics**	**Essential**																		
	MTI200	**Research project**	**Essential**																		

MTI201	**Specialized Workshop**	**Essential**																		
MTI202	**Applied Project**	**Essential**																		
MTI203	**Vocational Safety**	**Essential**																		
CPN200	**Databases in SQL**	**Essential**																		
CPN201	**CryptographyAnd Computer Security**	**Essential**																		
CPN202	**Networks Management**	**Essential**																		
CPN203	**Electronic Web Design**	**Essential**																		
CPN204	**Web Site programming**	**Essential**																		
CPN205	**Visual Basic Programming**	**Essential**																		
CPN206	**Operating systems**	**Essential**																		

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
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	First
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	1 / 9 / 2024
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 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	Knowledge and application	Theoretical	Tests & Reports
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.	Knowledge and application	Theoretical	Tests & Reports

		-2In regional charters and national constitutions.			
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	Knowledge and application	Theoretical	Tests & Reports

		-Gender equality -Equality between individuals according to their beliefs and race to public authorities			
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

12. 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

13. 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.

Course Description Form/ Computer

Course Description

The objective of this course is to introduce students to computers, providing an overview of their scope and applications across various fields. It also covers programming fundamentals, equipping students with the skills to use computers for executing pre-prepared programs relevant to their specialization.

Additionally, the course description offers a concise summary of its key features and expected learning outcomes, demonstrating whether students have maximized their learning opportunities and effectively applied their knowledge.

1.Educational Institution	Northern Technical University
2. Scientific Department / Center	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course Name / Code	Computer/NTU102
4. Available Attendance Modes	Theoretical + Practical
5. Semester / Year	Course-based system
6. Total Study Hours	2 hours per week for 15 weeks (semester) / Theoretical + Practical
7.Date of Description Preparation	26/10/2024
8. Course Objectives	

By the end of this training unit, the student will have learned the fundamentals of computing and gained practical skills in using computers and their applications.

9. Course Learning Outcomes, Teaching, and Assessment Methods

A- Cognitive Objectives

A1- Enabling students to understand the fundamentals of computing.
A2- Helping students grasp basic programming concepts using modern software while keeping up with technological advancements.
A3- Equipping students with knowledge and skills to use computers and essential software applications.

B- Course-Specific Skill Objectives

B1- Scientific skills.
B2- Usage and development skills.
B3- Critical thinking and analytical skills.
B4- Ability to apply theoretical and practical knowledge in real-life applications while considering practical constraints.

Teaching and Learning Methods

1. Providing students with fundamental theoretical concepts through lectures.
2. Demonstrating practical exercises by the instructor.
3. Assigning students different exercises to develop their skills in using computers.

Assessment Methods

1. Daily interaction and topic preparation.
2. Daily and weekly quizzes.
3. Midterm and final exams..

C- Affective and Value-Based Objectives

C1- Teaching students discipline.
C2- Instilling patience and perseverance.
C3- Encouraging students to develop good manners and professional behavior when dealing with clients or users.

Teaching and Learning Methods

1. Using modern presentation tools like Data Show to enhance engagement and improve understanding.
2. Engaging students in discussion sessions using critical thinking questions (How, Why, When, Where, Which) for specific topics.

Assessment Methods

Midterm (Practical) + Final Exam (Practical).
Class participation, daily quizzes, assignments, and attendance are considered in yearly performance evaluation.

D- General and Transferable Skills (Other Skills Related to Employability and Personal Development)

D1- Encouraging students to explore the importance of computers across different fields.
D2- Developing students' ability to solve equations by programming them using computers.

11. Course Structure (Theory + Practical) – Computer Science

The week	Hours	Unit / Topic	Learning Outcomes	Teaching Method	Assessment Method
1st	2 hours	Windows Operating System: Features, Basic Requirements, and System Components	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
2nd	2 hours	Start Menu	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
3rd	2 hours	Taskbar (Task Bar)	Understanding and	Lecture, Practical	Explanation, Discussion,

			comprehending the subject	Session, Screen Demonstration, Visual Aids	Problem-Solving
4th	2 hours	Control Panel	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
5th	2 hours	Windows Shortcuts	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
6th	2 hours	Using Additional Programs (Accessories)	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
7th	2 hours	DOS System - Internal Commands	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
8th	2 hours	Commands (Move, Copy, Copy Con, Delete)	Understanding and	Lecture, Practical Session,	Explanation, Discussion,

			comprehending the subject	Screen Demonstration, Visual Aids	Problem-Solving
9th	2 hours	Commands (VER, VOL, RE)	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
10th	2 hours	External Commands	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
11th	2 hours	External Commands (Continued)	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
12th	2 hours	Internet Search Engines & Websites	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
13th	2 hours	How to Get Help (Help Features & Methods)	Understanding and comprehending the subject	Lecture, Practical Session, Screen	Explanation, Discussion, Problem-Solving

				Demonstration, Visual Aids	
14th	2 hours	Windows Operating System: Features, Basic Requirements, and System Components	Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving
15th	2 hours		Understanding and comprehending the subject	Lecture, Practical Session, Screen Demonstration, Visual Aids	Explanation, Discussion, Problem-Solving

12. Infrastructure	
Required Textbooks:	
Main References (Sources):	Prescribed Curriculum
Electronic References & Online Resources:	World Wide Web

13. Admission Requirements	
Prerequisites:	**1. Classroom** **2. Laboratory** **3. Computers** **4. Whiteboard and Accessories** **5. Data Show Projector**
14. Course Development Plan	

The increasing use of information technology and online references, along with content changes to keep up with the rapid advancements in the world of technology and information.

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course title/code	Arabic Language NTU103
4. Program (s) to which it contributes	Technical diploma
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical) * Discussions and reports
6. Semester/Year	First
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	1 / 9 / 2024

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	Discussion method, lecture method	Oral test

			4. Differentiate between types of verbs		
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	Discussion method,	Oral test

			administrative discourse	lecture method	
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. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course title/code	Sport NTU104
4. Program (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	First
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	8 / 1 / 2024

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 application	theoretical and practical	Tests & Reports
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	Northern Technical University/Mosul Technical Institute
2. Academic Department/Center	Department of Networks and Computer Software Techniques
3. Course Name/Code	Mathmatics
4. Available Attendance Formats	First-year students/Second course
5. Semester/Year	second semester/2024
6. Number of Class Hours (Total)	2 hours per week for 15 weeks (semester)
7. Date this Description Was Prepared	January 9, 2024

 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	- **1. Thomas Calculus** - **Principles of Differential and Integral Calculus by Dr. Ali Aziz Ali**

	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
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 / 2024 AD
6. Number of study hours (total)	Two hours per week for 15 weeks (course)
7. Date this description was prepared	9/1/2024

- **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).

-The ability to develop and enhance one's drawing skills
-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 Mirror command	Learn to draw an oval	Discussion method, lecture method	Daily Oral Test
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/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/2024
6. Number of Class Hours (Total)	2 hours per week for 15 weeks (semester)
7. Date this Description Was Prepared	January 9, 2024

 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,	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.	partitioning, and the use 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	Daily oral test
				Discussion method, lecture method	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.

Course Description Form(C++ Programming)

Course Description

This academic program description provides a concise summary of the program's key features and the expected learning outcomes that students should achieve, demonstrating whether they have made the most of the available opportunities. It is accompanied by a description of each course within the program.

1. Educational Institution	Northern Technical University
2. Scientific Department / Center	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course Name / Code	Programming in language C++/CPN100
4. Available Attendance Modes	Theoretical + Practical
5. Semester / Year	Course-based system
6. Total Study Hours	5 hours per week for 15 weeks (semester) / Theoretical + Practical
7. Date of Description Preparation	1/11/2024
8. Course Objectives	
A. Students will master the fundamentals and understand the basic principles of programming.	
B. Developing and enhancing problem-solving skills in programming while encouraging critical thinking.	
C. Strengthen practical skills and provide opportunities for students to apply acquired knowledge through developing small programs.	
D. Students will learn good programming practices.	

E. Encouraging students to apply concepts through hands-on projects and various programming challenges.

9. Course Learning Outcomes, Teaching, and Assessment Methods

A- Cognitive Objectives

A1- Students should be able to grasp fundamental programming concepts and write programs from scratch.
A2- Students should be capable of writing C++ programs that perform basic tasks such as mathematical calculations.
A3- Students should be able to apply loops (while, for) and conditional statements (if-switch) to solve programming problems.
A4- Students should master using arrays for data storage and functions for organizing and reusing code.
A5- Students should learn how to debug and correct errors in programs.
A6- Beginning to develop more complex programming solutions.

B- Course-Specific Skill Objectives

B1- Students should be able to write C++ programs in an organized and efficient manner.
B2- Enhancing the ability to structure and design small programming projects.
B3- Students should be able to use development tools and environments such as Visual Studio.
B4- Implementing real-world programs to solve various problems.

Teaching and Learning Methods

1. Theoretical lectures
2. Scientific discussions in classrooms
3. Small-group learning method
4. Conducting practical experiments in laboratories
5. Seminars where students present the latest global scientific advancements
6. Scientific films and other visual aids
7. Structured training
8. Summer training

Assessment Methods

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

C- Affective and Value-Based Objectives

C1- Enhancing students' skills in logical analysis and fostering patience and perseverance to reach optimal solutions.

C2- Encouraging students to appreciate continuous learning in programming and technology.

C3- Motivating students to develop high-quality software while paying close attention to code details.

C4- Boosting students' confidence through their ability to solve programming problems and write efficient code.

C5- Developing creativity by finding new and innovative solutions to technical problems and thinking outside the box.

Teaching and Learning Methods

1. Theoretical lectures
2. Scientific discussions in classrooms
3. Small-group learning method
4. Conducting practical experiments in laboratories
5. Seminars where students present the latest global scientific advancements
6. Scientific films and other visual aids
7. Structured training

Assessment Methods

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

D - General and Transferable Skills (Other Skills Related to Employability and Personal Development)

D1- Programming provides students numerous opportunities to develop innovative solutions for technical problems.

D2- Developing programming projects in teams. Learning C++ enhances the ability to work in programming teams and collaborate toward a shared goal, a valuable skill in most professional fields.

D3- Time management and working under pressure.

D4- Students develop structured and organized thinking through learning programming, including planning before writing code.

D5- Preparing students for diverse career opportunities, enhancing their employability in fields that require critical thinking, creativity, and technology skills.

10. Weekly Course Plan – C++ Programming					
Week	**Hours**	**Learning Outcomes**	**Unit / Topic Name**	**Teaching Method**	**Assessment Method**
1st	2 Theory, 3 Practical	1. Understanding the concept of programming languages and their importance in software development. 2. Differentiating between high-level and low-level programming languages. 3. Identifying the key features of C++ and its applications. 4. Learning how to install C.++	Introduction to C++	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
2nd	2 Theory, 3 Practical	1 . Understanding different data types in C++ (int, float, char, string). 2 .Writing simple programs	C++ Basics and Data Types	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions

		using variables in C.++			
3rd	2 Theory, 3 Practical	1. Explaining the concept of operators in C++ (arithmetic, logical, and comparison). 2. Differentiating between various operator types.	Operators in C++	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
4th	2 Theory, 3 Practical	Writing small programs using operators and statements to achieve specific goals.	Programming Statements in C++	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
5th	2 Theory, 3 Practical	1. Designing solutions for simple problems using arithmetic operations and programming statements in C++. 2. Explaining the concept of selection statements (if, else if) and their role in controlling program flow. 3. Implementing selection statements for decision-making in programs.	Mathematical & Programming Equations + Selection Statements	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions

6th	2 Theory, 3 Practical	1. Understanding nested and conditional selection statements (if, else if, switch) and their role in program control. 2. Applying selection statements to solve decision-making problems in programs.	Selection Statements (Continued)	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
7th	2 Theory, 3 Practical	1. Explaining the concept of loops (while) and their importance in executing repetitive code. 2. Writing programs using loops for iterative operations.	Loop Statements	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
8th	2 Theory, 3 Practical	Applying various examples of all previously covered topics.	Comprehen sive Review	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
9th	2 Theory, 3 Practical	1. Writing basic **for** loops for executing repetitive operations. 2. Implementing	Loop Statements (Continued)	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions

		nested loops for handling complex operations like pattern printing or data table processing.			
10th	2 Theory, 3 Practical	1. Implementing complex nested loops. 2. Solving advanced programming challenges using nested loops.	Loop Statements (Continued)	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
11th	2 Theory, 3 Practical	1. Understanding the **do-while** loop and its role in executing repeated code. 2. Solving programming challenges requiring **do-while** loops.	Loop Statements (Continued)	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
12th	2 Theory, 3 Practical	1. Implementing **break** statements in loops (**for, while**) to terminate iterations based on conditions. 2. Using **continue** statements to skip specific iterations in a loop.	Control Statements & Go-To Looping	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions

13th	2 Theory, 3 Practical	1- Defining one-dimensional arrays in C.++ 2- Initializing and modifying array elements. 3-Accessing array elements using indexing. 4-Using loops to iterate through arrays for calculations like sum and average.	One-Dimensional Arrays	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
14th	2 Theory, 3 Practical	1. Defining **two-dimensional arrays** in C++. 2. Initializing and modifying elements in a **2D array**. 3. Using loops to iterate through 2D arrays for various operations.	Two-Dimensional Arrays	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions
15th	2 Theory, 3 Practical	1. Understanding the role of **functions** in programming. 2. Declaring functions, setting return	Functions + General Review	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions

		types, and defining parameters. 3. Understanding function return values and their importance. 4. Applying functions to structure code efficiently.			

11. Infrastructure

Infrastructure

1- Required Textbooks	**1cpp.pdf (uotechnology.edu.iq)** Bashar Saadoun Mahdi, University of Technology, Computer Science Department – Structured Programming in C++
2- Main References (Sources)	**1cpp.pdf (uotechnology.edu.iq)** Bashar Saadoun Mahdi, University of Technology, Computer Science Department – Structured Programming in C++
A- Recommended Books and References (Scientific journals, reports, etc.).:	
B- Electronic References (Internet Resources)	World Wide Web and educational YouTube channels Lecture video series based on the book: https://www.youtube.com/playlist?list=PLnI1fRHezj5F8y024ulIKxV-DqdIyR4E6

12.	Course Development Plan
1-	Content Update: Adding new topics like Object-Oriented Programming (OOP).
2-	Using Modern Development Environments: Transitioning from old IDEs to advanced tools like Visual Studio Code.
3-	—Integrating Smart Tools: Useg Codeium and GitHub Copilot to assist students in writing code quickly and accurately.
4-	Student Evaluation: Assessing students through real-world software development projects that apply their C++ knowledge.
5-	Encouraging Teamwork: Promoting group projects to enhance collaboration and project development skills.

Course Description Form(Computer Architecture)

Course Description

This course introduces students to the fundamental concepts of computer architecture and design, focusing on number systems, arithmetic operations, and digital circuits. The course covers logic gates, Karnaugh maps, combinational and sequential circuit design, counters, multiplexers, and memory units. The emphasis is on both theoretical and practical aspects of designing and implementing digital systems, enabling students to understand modern computing architecture fundamentals and apply logical design techniques in building processing units.

1. Educational Institution	Northern Technical University
2. Scientific Department / Center	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course Name / Code	Computer Architecture CPN102
4. Available Attendance Modes	Theoretical + Practical
5. Semester / Year	Course-based system
6. Total Study Hours	5 hours per week for 15 weeks (semester) / Theoretical + Practical
7. Date of Description Preparation	1/11/2024
8. Course Objectives	
• **Understand number system conversions and their applications in computing.**	
• **Recognize arithmetic operations in different number systems.**	
• **Analyze and design basic and advanced logic gates.**	

- **Use Karnaugh maps to simplify logical expressions.**
- **Comprehend combinational and sequential circuit design.**

9. Course Learning Outcomes, Teaching, and Assessment Methods

A- Cognitive Objectives

A1-Understand the fundamental concepts of computer architecture, including processor design, storage systems, and input/output units.

A2-Recognize different types of computer memory, such as RAM, ROM, cache, and registers.

A3-Comprehend how central processing units (CPUs) function and how data is organized within them.

A4-Differentiate between combinational and sequential circuit design and their impact on processor performance.

A5-Understand the evolution of computer architecture from early processors to modern computing.

B- Course-Specific Skill Objectives

B1- Design and analyze logic gates and use them to build basic digital systems.
B2- Apply Karnaugh maps (K-Map) to simplify logical expressions and efficiently design logic circuits.
B3- Use low-level programming languages like Assembly to write programs that interact directly with computer components.
B4- Implement practical projects related to processor design using tools such as VHDL or Verilog.

Teaching and Learning Methods

1. Theoretical lectures
2. Scientific discussions in classrooms
3. Small-group learning method
4. Conducting practical experiments in laboratories
5. Seminars where students present the latest global scientific advancements
6. Scientific films and other visual aids
7. Structured training
8. Summer training

Assessment Methods

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

C- Affective and Value-Based Objectives

C1- Appreciate the importance of computer architecture in designing modern devices such as smartphones, personal computers, and cloud servers.

C2- Develop responsibility in handling digital technologies and understand the impact of engineering decisions on performance and security.

C3- Exhibit a positive attitude toward continuous learning in computer engineering to keep up with rapid advancements in the field.

C4- Adhere to ethical principles in technology usage, including respecting intellectual property and ethical software and hardware design.

Teaching and Learning Methods

1. Theoretical lectures
2. Scientific discussions in classrooms
3. Small-group learning method
4. Conducting practical experiments in laboratories
5. Seminars where students present the latest global scientific advancements
6. Scientific films and other visual aids
7. Structured training

Assessment Methods

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

D - General and Transferable Skills (Other Skills Related to Employability and Personal Development)

D1- Develop technical problem-solving skills, particularly in designing and analyzing computer systems.

D2- Enhance critical thinking and analytical skills in comparing different processors and understanding engineering decisions' impact on performance.
D3-Acquire effective communication skills to explain computer architecture concepts to both specialists and non-specialists.
D4- Learn teamwork skills in digital system design projects, fostering collaboration and innovation.
D5- Gain adaptability and flexibility in dealing with emerging developments in computer design and new technologies.

10. Weekly Course Plan –

Week	Hours	Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	5 hours	Understanding number system conversions	Number System Conversions	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
2	5 hours	Understanding arithmetic operations in number systems	Arithmetic Operations in Number Systems	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
3	5 hours	Analyzing basic logic gates	Logic Gates (AND, OR, NOT)	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
4	5 hours	Understanding advanced logic gates	XOR, NAND, NOR Gates	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
5	5 hours	Designing combinational circuits	Combinational Circuit Design	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

6	5 hours	Analyzing sequential circuits	Sequential Circuits (FF, Registers)	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
7	5 hours	Using Karnaugh maps for circuit simplification	Karnaugh Maps	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
8	5 hours	Understanding half and full adder design	Half and Full Adder Design	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
9	5 hours	Designing half and full subtractors	Half and Full Subtractor Design	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
10	5 hours	Analyzing counter and multiplexer units	Counters and Multiplexers	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
11	5 hours	Implementing basic memory circuits	Memory Circuits	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
12	5 hours	Comparing sequential and combinational design	Synchronous vs. Asynchronous Design	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
13	5 hours	Implementing projects using logical design	Mini Processor Unit Design Project	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

14	5 hours	Analyzing advanced logical design techniques	Advanced Logical Design in Modern Computing	Lecture + Practical Training	Presentation , Explanation , Q&A, Discussion
15	5 hours	Comprehensive review and final exam	Comprehens ive Course Evaluation	Lecture + Practical Training	Discussion

11. Infrastructure	
1- Required Textbooks	"Computer Organization and Design: The Hardware/Software Interface" – David A. Patterson & John L. Hennessy
2- Main References (Sources)	"Computer Architecture: A Quantitative Approach" – John L. Hennessy & David A. Patterson
A- Recommended Books and References (Scientific journals, reports, etc.).:	
B- Electronic References (Internet Resources)	World Wide Web and educational YouTube channels

12. Course Development Plan

1- Updating the content to align with the latest advancements in computer architecture and design.

2- Enhancing practical aspects through real-world projects and applications using digital simulators.

3- Introducing modern concepts such as parallel computing, multi-core processors, and AI-based design.

4- Utilizing modern tools for digital circuit analysis and design such as VHDL, Verilog, and FPGA.

5- Encouraging research and innovation in digital engineering and computer architecture.Encouraging Teamwork: Promoting group projects to enhance collaboration and project development skills.

Course Description – Computer Organization (CPN103)

This course aims to introduce students to the concepts and structure of computer systems, explaining how different components interact within a computer. The course focuses on fundamental design principles, including the CPU, memory, input/output (I/O), and storage units.

1. Educational Institution	Northern Technical University
2. Scientific Department / Center	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course Name / Code	Computer Assembly/CPN103
4. Available Attendance Modes	Theoretical + Practical
5. Semester / Year	Course-based system
6. Total Study Hours	5 hours per week for 15 weeks (semester) / Theoretical + Practical

7. Date of Description Preparation	1/9/2024

8. Course Objectives

- Understanding the fundamentals of computer assembly and how computers function.
- Acquiring basic programming skills to perform simple computational tasks.
- Learning about key computing concepts such as memory, processing, input, and output.
- Developing logical thinking and data-handling abilities.
- Applying theoretical knowledge to create simple computing solutions.

9. Course Learning Outcomes, Teaching, and Assessment Methods

Teaching and Learning Methods: Discussion-based learning, Lecture-based instruction
Assessment Methods: Daily exams, Midterm and final exams, Oral examinations, Reports

A- Cognitive Objectives

A1- Understanding the **fundamental concepts of computers** and their different technologies.
A2- Learning about **computer memory** and its different types.
A3- Understanding **maintenance and troubleshooting** of internal computer components.
A4- Identifying **hardware and software components** of a computer.

B. Course-Specific Skill Objectives

B1- Ability to **assemble and disassemble** basic computer components.
B2- Learning **low-level programming languages**, enabling students to write and execute simple **Assembly Language** programs that directly interact with hardware.

C. Affective and Value-Based Objectives

C1- **Appreciating the role of technology** in daily life and its impact across industries.
C2- Developing **responsibility** in handling computers, including data privacy and cybersecurity awareness.
C3- Encouraging **continuous learning** in the field of computing.
C4- Promoting **ethical computing practices**, including respecting intellectual property and using legal software.
C5- Enhancing **teamwork and collaboration** skills through shared projects in computer assembly and simulation.
C6- Building **confidence** in solving technical problems and troubleshooting computer-related issues.
C7- Encouraging **innovation and creativity** in using computers for problem-solving.

D. General and Transferable Skills (Employability and Personal Development)

D1- Developing problem-solving skills to analyze technical issues logically.
D2- Strengthening critical thinking and analytical skills for decision-making in technology fields.
D3- Enhancing effective communication skills, both written and verbal, for explaining technical concepts.
D4- Building teamwork and collaboration abilities for working on technical projects.
D5- Developing adaptability and flexibility in learning new technologies and adjusting to different working environments.
D6- Learning research and information-gathering techniques for solving technical problems.
D7- Gaining organizational and project management skills for handling small-scale computing projects.
D8- Encouraging self-learning abilities for continuous growth in the tech field.

D9- Boosting confidence in using modern technologies, increasing job opportunities in the industry.

11. Course Structure (Theory + Practical) – Computer Science					
The week	**Hours**	**Learning Outcomes**	**Introduction to Computers**	**Lecture + Practical Training**	**Presentation, Explanation, Q&A, Discussion**
1st	five hours	1 .Listing computer characteristics. 2 . Classifying computer types. 3 . Identifying computer safety requirements.	Hardware and Software Components	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

2nd	five hours	1. Comparing input and output devices. 2. Differentiating between primary and secondary memory. 3. Defining the system unit…	Power Supply Unit	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
3rd	five hours	1. Explaining the function of an **Uninterruptible Power Supply (UPS)**. 2. Understanding the **Power Supply Unit (PSU)**.	Motherboard	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

4th	five hours	1. Understanding the importance of the motherboard. 2. Identifying motherboard components. 3. Comparing the **Northbridge and Southbridge**. 4. Differentiating between expansion slots.	Sockets and Buses	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
5th	five hours	1. Explaining the purpose of **sockets**. 2. Comparing different types of computer buses.	Processor (CPU)	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

6th	five hours	1. Identifying processor performance factors. 2. Comparing types of processors. 3. Listing processor components. 4. Drawing a **CPU operation flowchart**. 5. Classifying processors based on **physical design**.	Primary and Secondary Memory	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

7th	five hours	1. Listing types of memory. 2. Differentiating between **primary and secondary memory**. 3. Identifying **RAM and ROM** features. 4. Comparing **RAM vs. ROM**. 5. Understanding **static vs. dynamic memory**.	Floppy Disk Drive	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

8th	five hours	1. Understanding **floppy disk drives (FDD)**. 2. Explaining the operation of an **FDD**. 3. Installing an **FDD** inside a computer. 4. Calculating storage capacity of floppy disks.	Hard Disk Drive	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
9th	five hours	1. Defining the **hard disk drive (HDD)**. 2. Explaining the working mechanism of **HDDs**. 3. Installing an **HDD** in a computer. 4. Comparing **HDD vs. SSD**.	Solid-State Storage Units	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

10th	five hours	1. Understanding **flash memory units**. 2. Explaining how **flash memory works**. 3. Installing a **flash-based storage unit** in a computer.	Optical Disc Drives	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
11th	five hours	1. Explaining how data is stored on **optical discs**. 2. Installing an **optical disc drive (ODD)**.	Assembling a Computer – Part 1	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
12th	five hours	1. Installing the **motherboard**. 2. Installing storage devices. 3. Installing power supply components.	to gather device Computer	a lecture + Practical training	Presentation, explanation, questions and answers, discussion

13th	five hours	1. Connecting **data cables**. 2. Installing **expansion cards**.	to gather device Computer	a lecture + Practical training	Presentation, explanation, questions and answers, discussion
14th	five hours	1. Listing system buses. 2. Comparing **ISA vs. EISA**. 3. Differentiating between **serial and parallel ports**.	Outlets Expansion	a lecture + Practical training	Presentation, explanation, questions and answers, discussion
15th	five hours	1. Explaining virus components. 2. Describing **virus transmission methods**. 3. Classifying viruses based on **type and speed**.	Viruses	a lecture + Practical training	discussion

11. Infrastructure

Required Textbooks:	
Main References (Sources):	Prescribed Curriculum
Electronic References & Online Resources:	World Wide Web

12. Admission Requirements

Prerequisites:	**6. Classroom** **7. Laboratory** **8. Computers** **9. Whiteboard and Accessories** **10. Data Show Projector**

13. Course Development Plan

1. Updating Academic Content :Introducing modern topics such as multi-core processors, AI in processor design, and cloud computing to expand students' knowledge of current technology enhancing academic references by providing the latest books, research papers, and reliable digital sources to help students stay updated with ongoing advancements in computing.
2. Support and Consultation Sessions: We offer advisory hours for students facing challenges in understanding specific concepts and provide additional learning resources to assist students in overcoming academic difficulties.
3. Launching a Digital Learning Platform :Giving students access to extra educational materials, including video tutorials and interactive quizzes, to enhance their learning experience
4. Regular Course Evaluation and Updates :Conducting student surveys to gather feedback on course content and teaching methods.

Utilizing student insights to refine the curriculum and teaching strategies .

Annual curriculum review to integrate the latest academic and technological trends into course content and teaching methodologies.

Course Description Form(Computer Networks)

Course Description

The "Fundamentals of Computer Networks" course aims to introduce the basic concepts of how networks operate, their components, types, and various protocols. Computer Networks is one of the most prestigious subjects in the field of Information Technology, as it certifies the holder with essential skills in the area of computer networks. This course provides the knowledge and experience required to design, implement, manage, and maintain different types of computer networks

1. Educational Institution	Northern Technical University
2. Scientific Department / Center	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course Name / Code	Computer Networks CPN105
4. Available Attendance Modes	Theoretical + Practical
5. Semester / Year	Course-based system
6. Total Study Hours	5 hours per week for 15 weeks (semester) / Theoretical + Practical
7. Date of Description Preparation	1/11/2024
8. Course Objectives	
• Students will be able to understand the basic concepts of computer networks.	
• Students will be introduced to common networking devices.	
• Students will be able to understand basic network protocols.	
• Students will apply common network solutions.	

- Students will be able to analyze and troubleshoot network issues.

9. Course Learning Outcomes, Teaching, and Assessment Methods

A- Cognitive Objectives

A1- Understand the fundamentals of computer networks (definition of networks and their importance in the world of technology and communications), and distinguish between the different types of networks (LAN, WAN, MAN, WLAN, PAN, VPN).
A2- Comprehend network models and protocols.
A3- Recognize transmission media and communication technologies.
A4- Master the concepts of addressing in networks.
A5- Explore and manage networks.
A6- Understand network security concepts and cybersecurity risks.

B- Course-Specific Skill Objectives

B1. Set up and configure local and wireless networks.
B2. Analyze and troubleshoot network problems using advanced tools.
B3. Implement routing and communication protocols effectively.
B4. Apply security strategies to protect networks and data.
B5. Design networks that meet the needs of small and medium-sized businesses.

Teaching and Learning Methods

1. Theoretical lectures
2. Scientific discussions in classrooms
3. Small-group learning method
4. Conducting practical experiments in laboratories
5. Seminars where students present the latest global scientific advancements
6. Scientific films and other visual aids
7. Structured training
8. Summer training

Assessment Methods

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

C- Affective and Value-Based Objectives

C1. Promote work ethics in the field of networking.
C2. Foster a spirit of teamwork and collaboration.
C3. Develop analytical thinking and problem-solving skills.
C4. Encourage innovation and creativity in the field of networking.
C5. Develop professional responsibility through awareness of network security and stability in work environments.

Teaching and Learning Methods

1. Theoretical lectures
2. Scientific discussions in classrooms
3. Small-group learning method
4. Conducting practical experiments in laboratories
5. Seminars where students present the latest global scientific advancements
6. Scientific films and other visual aids
7. Structured training

Assessment Methods

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

D - General and Transferable Skills (Other Skills Related to Employability and Personal Development)

D1. Critical thinking and problem-solving skills.
D2. Effective communication and interpersonal skills.
D3. Teamwork and collaboration skills.
D4. Time management and organizational skills.
D5. Continuous learning skills and adaptability to technological advancements.
D6. Entrepreneurial and innovative skills

10. Weekly Course Plan –

Week	Hours	Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	5 hours	Upon completing the unit, the student will be able to:	Networks Today	Lecture + Practical Training	Presentation , Explanation

		Accurately explain the different network models (OSI and TCP/IP). Identify types of cables and network connections (Ethernet, Wi-Fi, etc.) used in various networks. Correctly use basic computer networking terminology.			, Q&A, Discussion
2	5 hours	Ability to Assess Network Performance: • Analyze the costs of network components • Identify network issues	Network components	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
3	5 hours	• Representing networks using diagrams • Understanding the factors influencing the choice of network topology • Recognizing advanced networks and their evolution	Network Topologies and Representations	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

4	5 hours	Critical Thinking in Choosing the Appropriate Network Type • Addressing scalability and flexibility issues in networks • Interacting with the future requirements of networks	Common Types of Networks	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
5	5 hours	Awareness of the Importance of Security in Internet Communications • Critical thinking in improving internet connectivity • Adherence to global internet standards	Internet Communications	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
6	5 hours	Ability to Analyze Network Reliability • Ability to conduct tests to verify the effectiveness of redundancy and security strategies, such as failure testing • Measuring the security level in a reliable network	Reliable Networks	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

7	5 hours	Understanding the Latest Network Trends • Understanding the importance of transitioning to smart networks • Recognizing the challenges of modern net-works • Understanding types of threats such as mal-ware	Network Trends and Network Security	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
8	5 hours	Network Performance Analysis • Evaluating the impact of routing policies • Reviewing se-curity in net-works • Analyzing best practices for network seg-mentation	Rules	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
9	5 hours	• Understanding the concept of protocols • Recognizing different types of protocols • Understanding the concept of inter-layer com-munication	Protocols	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

		• Understanding internet-focused protocols Awareness of security-specific protocols			
10	5 hours	Recognizing the key organizations involved in computer network standardization Understanding standard models in computer networks Understanding the importance of standards in enhancing security in computer networks	Standardization Organizations	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
11	5 hours	Recognizing the OSI and TCP/IP models Understanding the layers of the OSI reference model Analyzing the functions of layers in the network communication process	Reference Models	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
12	5 hours	Recognizing the functions of the physical layer Understanding the transmission media used in the physical layer Identifying the characteristics of signals in the physical layer	Physical Layer	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

13	5 hours	Recognizing advanced routing protocols Understanding data traffic control protocols Identifying advanced security protocols	Advanced Network Protocols	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
14	5 hours	Recognizing the standards and technologies of wireless networks Understanding the characteristics of wireless networks Identifying wireless network protocols Recognizing security methods in wireless networks Understanding security threats in wireless networks	Wireless Networks and Network Security	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
15	5 hours	Recognizing Software-Defined Networks (SDN) Understanding the Internet of Things (IoT) and its impact on future networks Identifying cloud computing network technologies and their effect on future networks	Future Networks and Emerging Trends	Lecture + Practical Training	Discussion

11. Infrastructure	
1- Required Textbooks	• "Computer Networks: A Cisco Perspective" by Dr. Mohamed Othman and Mr. Mohamed Abdelkader

	• Computer Networks: A Theoretical and Applied Approach by Dr. Adel Ibrahim Computer Networks: A Practical Perspective by Dr. Samir Mahmoud
2- Main References (Sources)	• "Computer Networks: A Cisco Perspective" by Dr. Mohamed Othman and Mr. Mohamed Abdelkader • Computer Networks: A Theoretical and Applied Approach by Dr. Adel Ibrahim Computer Networks: A Practical Perspective by Dr. Samir Mahmoud
A- Recommended Books and References (Scientific journals, reports, etc.).:	• "Fundamentals of Computer Networks" by Dr. Mohamed Kamel Naseef "Computer Networks: TCP/IP Protocols" by Dr. Adel Ibrahim
B- Electronic References (Internet Resources)	Cisco Academy Arabic Channel: **https://www.youtube.com/watch?v=4u3LVXDOkyw&list=PLpwHU9rNXAVurp2h2Jh-cd4-8XjkT5osu**

12.	Course Development Plan
	None

Course Description / Internet of Things

The "Internet of Things" (IoT) course provides students with a comprehensive understanding of the fundamental concepts and technologies that form the foundation of this modern technology. The course focuses on how devices and systems are interconnected via the internet to exchange data, enhancing business performance and daily life.

It covers topics such as sensors and actuators, IoT networks and protocols, data security and privacy, and real-world IoT applications in various fields, including healthcare, smart agriculture, smart homes, and smart cities.

1. Educational Institution	Northern Technical University
2. Scientific Department / Center	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course Name / Code	Internet of Things/CPN107
4. Available Attendance Modes	Theoretical + Practical
5. Semester / Year	Course-based system
6. Total Study Hours	5 hours per week for 15 weeks (semester) / Theoretical + Practical
7. Date of Description Preparation	1/9/2024
8. Course Objectives	

- Understanding the fundamental concepts of the Internet of Things (IoT) and its various technologies.
- Developing the technical skills to design, develop, and implement IoT solutions.
- Analyzing and evaluating different IoT applications in real-life scenarios.
- Encouraging creative and innovative thinking among students to develop new IoT technology applications.

9. Course Learning Outcomes, Teaching, and Assessment Methods

Teaching and Learning Methods: Discussion-based learning, Lecture-based teaching

Assessment Methods: Daily exams, Midterm exams, Final exam

A- Cognitive Objectives

A1- Understanding the fundamental concepts of the Internet of Things (IoT) and its various technologies.

A2- Understanding how embedded systems function in IoT devices.

A3- Learning how to design and implement networks and protocols that support IoT.

A4- Understanding data security and privacy concepts in IoT, along with modern encryption algorithms used in this field.

B- Course-Specific Skill Objectives

B1- Ability to design and implement basic IoT projects.

B2- Understanding how to integrate different systems seamlessly within an IoT environment.

C- Affective and Value-Based Objectives

C1- Developing critical and creative thinking skills to create innovative IoT solutions.

C2- Analyzing security and privacy requirements in IoT systems.

D- General and Transferable Skills (Other Skills Related to Employability and Personal Development)

D1- Understanding how networks operate and devices communicate within an IoT system.

D2- Developing teamwork and collaboration skills to work effectively in IoT project teams.

10. **Weekly Course Plan –**

Week	Hours	Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1st	five hours	1. Understanding how IoT works. 2. Understanding the fundamental concepts of IoT.	Introduction to IoT	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
2nd	five hours	1. Understanding how different devices integrate in an IoT system to create smart solutions. 2. Analyzing how data is exchanged between devices using wired and wireless networks.	Common IoT Devices & Sensors	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
3rd	five hours	Understanding how to process data collected from devices using data analysis and machine learning techniques.	IoT Technology Layers	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

4th	five hours	1. Identifying the essential hardware components of IoT. 2. Understanding how to select appropriate components for an IoT project based on requirements.	IoT Hardware & Device Selection	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
5th	five hours	1. Identifying different types of cables used in networks. 2. Understanding the Ethernet protocol and how it works in wired networks.	Network Devices & Ethernet Protocol	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
6th	five hours	1. Understanding the importance of IoT protocols in enabling device communication. 2. Understanding the structure and main components of the MQTT protocol.e	IoT Protocols & MQTT	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
7th	five hours	Ability to set up a simple working environment using the CoAP protocol, including sending and receiving messages.	CoAP Protocol & IoT Messaging	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
8th	five hours	1. Identifying different types of IoT networks. 2. Discussing challenges related to IoT networks.	IoT Network Types & Challenges	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

9th	five hours	1. Understanding the concept of cloud computing for data processing. 2. Recognizing the differences between traditional data processing and cloud computing.	Cloud Computing & Data Processing	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
10th	five hours	1. Understanding the challenges related to fog computing for data processing. 2. Identifying the challenges in fog computing.	Fog Computing & Challenges	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
11th	five hours	1. Understanding the components of edge computing and how they function within IoT systems. 2. Ability to identify the advantages of edge computing for data processing.	Edge Computing & Data Processing	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
12th	five hours	1. Recognizing IoT applications. 2. Understanding the challenges related to IoT applications. 3. Identifying trends and future developments in IoT.	IoT Applications & Future Trends	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

13th	five hours	Understanding IoT-related security and privacy challenges and acquiring knowledge and skills to enhance them.	IoT Security Challenges & Privacy	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
14th	five hours	1. Understanding the concept of blockchain and how it functions as a distributed database. 2. Understanding the structure of blockchain, including blocks, chains, and encryption.	Blockchain & IoT Data Protection	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
15th	five hours	Understanding IoT concepts and analyzing its fundamental architecture.	Final Review & Student Seminar	Lecture + Practical Training	Discussion

11. Infrastructure

Required Textbooks:	• Internet of Things (IoT): Principles, Paradigms and Applications
Main References (Sources):	• Internet of Things Challenges, Advances, and Applications
Electronic References & Online Resources:	World Wide Web

12. Course Development Plan

The course development plan aims to enhance students' understanding of **IoT technology and its practical applications**, enabling them to engage effectively in this evolving field. By equipping students with both **theoretical knowledge and practical skills**, the course prepares them to tackle future **technical challenges** in the IoT domain.

1. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course title/code	Computer2 **NTU 201**
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical and practical) * Scientific discussions, seminars, other activities
6. Semester/Year	Second
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	8 / 7 / 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	Knowledge and practical application	Practical + Theoretical	Tests & Discussion

		Styles: Normal / No Spacing / Heading 1 / Heading 2 / Subtitle / Change Styles / Show Preview / Disable Linked Styles / Options Edit: Find/Go/Replace/Select			
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	Mosul Technical Institute/ Anesthesia Techniques Department
3. Course title/code	Arabic Language NTU202
4. Programme (s) to which it contributes	Anesthesia Techn.deploma
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical) * Discussions and reports
6. Semester/Year	second
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	8 / 1 / 2024

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, 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 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. Teaching Institution	Ministry of Higher Education and Scientific Research / Northern Technical University
2. University/ Department	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course title/code	Crimes of the Baath regime in Iraq NTU203
5. Modes of Attendance offered	* Weekly lesson schedule (theoretical) * Scientific discussions
6. Semester/Year	second
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	8 / 7 / 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

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 violations of the Baath regime	Knowledge and practical application	theoretical	Tests & Discussion
8	2	- Places of Prisons and Detention of the Baath Regime	Knowledge and practical application	theoretical	Tests & Discussion

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

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 Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course title/code	**Professional Ethics NTU204**
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	**5/1/2024**
.Course objectives	
-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	
-Teaching the professional ethics course is considered the cornerstone of preparing future generations professionally and ethically.	
-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.	
.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-.Recognition of user rights is a core ethical duty in networks and software, ensuring privacy, security, and transparency.	
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 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). Dr1- Skills of modern interactive teaching methods among students. Dr2- Scientific competition skills among students through asking questions.

11. Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	week
Duties Quizzes Reports	Theoretical lectures Group discussions	Moral.	identification requester Concept Moral	2	1
Duties Quizzes Reports	Theoretical lectures	Work and profession.	Define the student the difference between work and profession	2	2

	Group discussions				
Duties Quizzes Reports	Theoretical lectures Group discussions	Professional ethics.	The student understands the nature of professional ethics	2	3
Duties Quizzes Reports	Theoretical lectures Group discussions	Values and professional ethics.	Introducing the student to the values and ethics of the profession	2	45&
Duties Quizzes Reports	Theoretical lectures Group discussions	Patterns of unethical behavior In the profession.	Introducing the student to patterns of unethical behavior Administrative corruption + bribery + fraud at work	2	6&7
Duties Quizzes Reports	Theoretical lectures Group discussions	Means and methods of consolidating professional ethics.	Understand the means of consolidating values	2	8
Duties Quizzes Reports	Theoretical lectures Group discussions	Ethics of practicing professions Characteristics and duties of a technician.	Introducing the student to the duties of staff	2	9
Duties Quizzes Reports	Theoretical lectures Group discussions	.Patient rights.	Introducing the student to user rights	2	10

Duties Quizzes Reports	Theoretical lectures Group discussions	2.The technician's relationship with society and his responsibility towards the environment and public safety.	Introducing the student to the role of the technician in society	2	11&12
Duties Quizzes Reports	Theoretical lectures Group discussions	3.Professional relations (the technician's relationship with his colleagues in the health institution.	Clarifying the technician's relationship with his co-workers and his subordinates	2	13&14
Duties	Theoretical lectures Group discussions	4.Ethics of teaching and learning for patients.	Understand and explain the ethics of teaching and learning to patients	2	15

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. • 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.	2- Main references (sources)

• Quality Assurance Unit (2017): Guide to Professional Ethics, Faculty of Arabic Language, Al-Azhar University, Cairo.	
	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

Course Description / SQL Databases

This academic program description provides a concise summary of the most important features of the program and the expected learning outcomes to be achieved

by the student, demonstrating whether they have made the most of the opportunities available. It is accompanied by a description of each course within the program.

1. Educational Institution	Northern Technical University / Technical Institute of Mosul
2. Academic Department / Center	Network Technologies and Computer Software
3. Course Name / Code	Databases – CPN200 / SQL
4. Attendance Format	Second-year students / First semester
5. Semester / Year	First Semester / 2025
6. Total Study Hours	2 hours per week for 15 weeks (Semester-based)
7. Date of Description Preparation	15/6/2025

8. Course Objectives

- Introduce students to database concepts and their types.
- Enable students to design and create simple databases.
- Teach students basic SQL query writing skills.
- Understand update, insert, and delete operations within a database.
- Enable data retrieval using conditions, sorting, and grouping.

9. Course Outcomes, Teaching and Assessment Methods

Teaching & Learning Methods:

- Theoretical lectures, practical applications, group work

Assessment Methods:

- Daily quizzes, practical assignments, midterm and final exams

A. Cognitive Goals

- Introduce students to database components (tables, fields, keys).
- Understand SQL structure and its use in relational databases.
- Differentiate between data types and their importance in building valid databases.
- Learn fundamental concepts of table relationships.

B. Skill-Based Goals

- Ability to create tables and connect them through appropriate relationships.
- Write and execute SQL queries (SELECT, INSERT, UPDATE, DELETE).
- Design an initial database using tools like MySQL or SQL Server.

C. Affective & Value Goals

- Promote teamwork during project execution.
- Develop logical and analytical thinking when dealing with data.

D. Transferable General and Employability Skills

- Enhance the ability to work with software systems and databases.
- Improve research, analysis, and decision-making skills using data.

10.Course Structure					
Week	**Hours**	**Learning Outcomes**	**Unit/Topic**	**Teaching Method**	**Assessment Method**
1	2	Understand the concept and components of databases	Introduction to Databases	Lecture + Application	Oral Test
2	2	Understand table structure and data types	Creating Tables & Defining Data Types	Lecture + Application	Practical Assignment
3	2	Perform insert operations	INSERT Commands	Practical	Practical Test
4	2	Perform delete operations	DELETE Commands	Lecture + Application	
5	2	Modify data in tables	UPDATE Commands	Lecture + Application	Test
6	2	Retrieve data using conditions	SELECT with WHERE	Practical	Test
7	2	Use comparison and logical operators	SELECT with Logical Operators	Lecture + Application	Test
8	2	Use sorting and grouping	ORDER BY – GROUP BY	Practical	Test
9	2	Work with table relationships	Primary and Foreign Keys	Lecture + Exercise	Test
10	2	Perform JOIN operations	INNER JOIN – LEFT JOIN	Lecture + Application	Test
11	2	Use built-in functions	COUNT, SUM, AVG, MAX, MIN	Practical	Test
12	2	Design a small-scale database	Mini Project	Workshop	Group Assessment
13	2	Comprehensive review	Review	Discussion	Oral Test

14	2	Prepare for final exam	Review	Practical Exercise	Test
15	2	Conduct final exam	Final Practical & Theoretical Test	Final Exam	Comprehensive Assessment

11.Infrastructure	
1. Required Textbooks	Introduction to Databases using SQL, by Ahmed Hassan, Dar Al-Ilm, 2023.
2. Main References (Sources)	• Database Systems: A Practical Approach to Design, Implementation, and Management – Connolly & Begg • Learning SQL – Alan Beaulieu
3. Recommended References (e.g., journals, reports, etc.)	
4. Online References / Websites	• w3schools.com/sql • sqlcourse.com • tutorialspoint.com/sql

12. Course Development Plan
• Update content to align with the latest SQL technologies used in the market. • Integrate practical applications using systems like MySQL or PostgreSQL.

- Design mini-projects that simulate real-world work scenarios.
- Encourage students to develop database projects related to their administrative specialties.

Course Title: Network Management

The "Network Management" course aims to equip students with the fundamental concepts of configuring, operating, and maintaining computer networks at various levels. The course covers topics such as network addressing, routing, management protocols, and performance monitoring. It also focuses on using network analysis tools, troubleshooting, and ensuring the security and efficiency of network infrastructure. Practical applications include simulations and software-based configurations and troubleshooting.

1. Educational Institution	Northern Technical University / Mosul Technical Institute
2. Scientific Department / Center	Computer Software and Network Technologies
3. Course Name / Code	Network Management / CPN202
4. Attendance Type	Second-year students / First Semester
5. Semester / Year	First Semester / 2025
6. Total Study Hours	5 hours per week for 15 weeks (2 theory + 3 practical)
7. Date of Description Preparation	June 5, 2025

Course Objectives

•Understand the layered architecture of computer networks, focusing on the Data Link and Network layers.
•Analyze data transfer methods, frame and packet structures, and encapsulation and routing mechanisms.
•Distinguish between address types (physical, logical, IPv4, IPv6) and their network uses.
•Design and interpret static and dynamic routing tables using appropriate protocols.
•Use tools like Wireshark and Packet Tracer to analyze performance and identify issues.
•Apply theoretical concepts in practical scenarios using simulations and real-world tasks.

10. Teaching and Assessment Methods

Teaching Methods: Lectures, hands-on labs, interactive learning, group discussions.
Assessment Methods: Midterm exams, projects and practical tasks, quizzes, attendance and participation, final exam.

A. Cognitive Objectives

- Identify the OSI model layers, focusing on the Data Link and Network layers.
- Explain Data Link Layer functions, including LLC and MAC sublayers, and access control mechanisms.
- Describe frame and packet structures, and key elements of encapsulation and routing.
- Differentiate protocols used at the Network layer (e.g., IPv4 and IPv6) and analyze their features.
- Clarify addressing concepts and distinguish between physical/logical, public/private address types.
- Understand core concepts of static/dynamic routing and network traffic scheduling.

B. Practical and Skill-Based Objectives

- Use simulation software like Packet Tracer and Wireshark to analyze network traffic and interpret frames and packets.
- Set up local area networks (LANs) and configure IP settings manually and automatically based on network architecture.
- Implement and configure static and dynamic routing tables using appropriate commands.
- Troubleshoot connectivity issues using diagnostic tools.
- Design logical and physical network topologies based on realistic standards.
- Apply addressing principles to efficiently distribute addresses in LANs or extended networks.

C. Affective and Ethical Objectives

- Foster teamwork through collaborative network projects.
- Instill responsibility and discipline when dealing with network systems and lab environments.
- Encourage self-learning and exploration of modern technologies.
- Promote respect for user rights, data privacy, and adherence to network ethics

D. Transferable and Employability Skills

- Develop analytical thinking and problem-solving skills in real-world tech environments.
- Build the ability for self-learning and adaptability to new networking technologies.
- Improve technical communication and presentation skills.
- Utilize specialized software tools to support decision-making in building or optimizing networks.

11. Course Structure

Week	Hours	Learning Outcomes	Unit / Topic	Teaching Methods	Assessment Methods

1	2 / 3	OSI Model & Data Link Layer; Core functions	Intro to Data Link Layer	Diagrams, presentation	Written Test
2	2 / 3	LLC & MAC sublayers functions & interaction	Data Link Sublayers	Activities, video	Exercises, discussion
3	2 / 3	Physical vs. logical topologies; LAN/WAN structures	Network Topologies	Case study, illustrations	Presentation
4	2 / 3	CSMA/CD vs. CSMA/CA; Half vs. Full Duplex	Media Access	Flowcharts, scenarios	Application Test
5	2 / 3	Frame structure: Header, Data, Trailer	Frame Structure	Examples, video	Quiz
6	2 / 3	MAC Address usage and local delivery	MAC Address	Demonstration, examples	Workshop
7	2 / 3	Network analysis using Wireshark	Comprehensive Review	Hands-on training	Practical Test
8	2 / 3	IP characteristics & Layer 3 roles	Network Layer Characteristics	Presentation, concept maps	Written Test
9	2 / 3	Encapsulation & routing concepts	Encapsulation & Routing	Scenarios, diagrams	Analytical Exercise
10	2 / 3	IPv4 vs. IPv6 properties; NAT issues	IPv4/IPv6 Protocols	Comparative study, discussion	Student Presentation
11	2 / 3	Header fields in IPv4/IPv6	Packet Headers	Technical analysis, practice	Quiz
12	2 / 3	Address types & general structure	Addressing	Use cases, flowcharts	Analytical Worksheet
13	2 / 3	Public/Private/Static/Dynamic IPs	IP Addresses	Interactive activities	Practical Exercise
14	2 / 3	Routing decisions; static vs. dynamic	Routing Configurations	Packet Tracer simulation	Practical Test
15	2 / 3	Review of all concepts and final project	Final Review	Projects, summary	Final Exam + Project

12. Infrastructure

1- Required Textbooks	•Computer Networks: A Cisco-Based Approach by Dr. Mohammed Othman and Mr. Mohammed Abdel Qader

	•Computer Networks: A Theoretical and Practical Approach by Dr. Adel Ibrahim • Computer Networks: A Practical Perspective by Dr. Samir Mahmoud
2- Main References	• Computer Networks: A Cisco-Based Approach by Dr. Mohammed Othman and Mr. Mohammed Abdel Qader • Computer Networks: A Theoretical and Practical Approach by Dr. Adel Ibrahim • Computer Networks: A Practical Perspective by Dr. Samir Mahmoud
a. Recommended References (Journals, Reports, etc.)	• Essentials of Computer Networks by Dr. Mohammed Kamel Nassif • Computer Networks: TCP/IP Protocols by Dr. Adel Ibrahim
b. Online Resources	• Cisco Arabic Academy Channel: https://www.youtube.com/watch?v=4u3LVX-DOkyw&list=PLpwHU9rNXA-Vurp2h2Jh-cd4-8XjkT5osu • https://www.youtube.com/playlist?list=PLQT0L6vDoR1QZMAD_OFHztOBQvdh_4WQD

12. Course Development Plan

None

Course Description / Web Programming

This academic program description provides a concise summary of the main features of the course and the intended learning outcomes that students are expected to achieve, indicating whether they have maximized their benefit from the available opportunities. A detailed description for each course is included within the program.

1. Educational Institution	Northern Technical University / Technical Institute of Mosul
2. Academic Department / Center	Network Technologies and Computer Software
3. Course Name / Code	Web Programming / CPN203
4. Attendance Format	Second-year students / Second semester course
5. Semester / Year	Second Semester / 2025
6. Total Study Hours	2 hours per week for 15 weeks (Semester-based)
7. Date of Description Preparation	June 20, 2025

8. Course Objectives

- Introduce students to web programming concepts and their importance.
- Enable students to use JavaScript to develop interactive web pages.
- Equip students with skills to manipulate browser programming elements (DOM).
- Develop modern programming skills (Event-driven programming).
- Train students to implement simple projects using JavaScript.
- Motivate students to build dynamic and interactive websites.

9. Course Outcomes, Teaching and Assessment Methods

- **Teaching & Learning Methods:** Lectures, practical exercises, group workshops.
- **Assessment Methods:** Daily quizzes, practical assignments, mid-term and final exams.

A. Cognitive Objectives

- Understand JavaScript structure and its role in web development.
- Identify basic concepts such as variables, loops, conditions, and functions.
- Comprehend the use of browser objects.

B. Skill-Based Objectives

- Write and execute JavaScript code within HTML pages.
- Interact with page elements using the DOM.
- Use events to create dynamic interactions.
- Build simple web applications (e.g., calculator, interactive lists, image viewer).

C. Affective and Value-based Objectives

- Enhance teamwork skills during projects.
- Develop logical and creative problem-solving abilities.

D. General and Transferable Skills (Employability and Personal Development)

- Develop the technical skills required for the web development job market.
- Improve analytical, experimental, and design skills using modern tools.

10.Course Structure					
Week	**Hours**	**Learning Outcomes**	**Unit/Topic**	**Teaching Method**	**Assessment Method**
1	2	Understanding web programming concepts	Intro to HTML and CSS (basic)	Interactive lecture + video	In-class activity
2	2	Learn what JavaScript is and its use	What is JavaScript? Why use it?	Live examples + simple application	Oral quiz
3	2	Write the first code	"Hello World" & Console use	Practical application	Simple homework
4	2	Use variables	Define different types of variables	Practice + manual exercise	Short quiz
5	2	Write conditions	Simple if-else structures	Group activity + practice	Practical task
6	2	Use loops	for loop – while loop	Roleplay + visual examples	Easy exercise
7	2	Use functions	Create basic functions	Group work (each writes a function)	Quiz
8	2	Interact with page elements	Intro to DOM (simplified)	Change text/images using JS	Practical task
9	2	Handle user interactions	Events (e.g., button changes background)	Small project	Project submission
10	2	Build input form	Create a basic form	Example: registration page	Practical exam
11	2	Validate form data	Input validation with conditions	Practice task	Practical activity
12	2	Use local storage	Simple use of Local Storage	Store user name	Simple assessment
13	2	General review	Review key concepts	Hands-on activity	Class exercise

14	2	Simple project	Build an interactive web page	Examples: calculator, image viewer	Practical assessment
15	2	Final exam	Basic theoretical and practical test	Measure overall understanding	Final exam

11.Infrastructure	
1. Required Textbooks	• *JavaScript for Beginners* – Author: Mohammed Sami, Modern Tech Press, 2023.
2. Main References (Sources)	• *Eloquent JavaScript* – Marijn Haverbeke • *JavaScript & jQuery* – Jon Duckett
3. Recommended References (e.g., journals, reports, etc.)	
4. Online References / Websites	• www.w3schools.com/js • https://developer.mozilla.org

12. Course Development Plan

- Update content to match modern JavaScript technologies (ES6+).
- Introduce more practical and creative applications.
- Integrate responsive design and use of JavaScript libraries.
- Encourage students to develop web projects that reflect real market needs and personal interests.

Course Description – Operating System (OS) (CPN206)

A collection of software responsible for managing hardware and software resources, acting as an intermediary between the user and computer hardware. It allows user programs to run and handles tasks such as memory management, disk access, device control, command prioritization, file management, and networking support..

. Educational Institution	Northern Technical University
2. Scientific Department / Center	Department Networks and Computer Software Techniques/ Technical Institute of Mosul
3. Course Name / Code	Operating System/CPN206
4. Available Attendance Modes	Theoretical + Practical
5. Semester / Year	Course-based system
6. Total Study Hours	5 hours per week for 15 weeks (semester) / Theoretical + Practical
7. Date of Description Preparation	1/6/2025

8. Course Objectives

- Students will learn about operating systems and their types.
- Students will become familiar with modern operating systems, both open and closed source.
- Students will understand the key structures used in building an OS.
- Students will learn how the CPU executes programs using various scheduling algorithms. Applying theoretical knowledge to create simple computing solutions.

10.Course Learning Outcomes, Teaching, and Assessment Methods

Teaching and Learning Methods: Discussion-based learning, Lecture-based instruction
Assessment Methods: Daily exams, Midterm and final exams, Oral examinations, Reports

A- Cognitive Objectives

A1: Define the operating system, its functions, and its relationship with hardware components.

A2: Explain process creation and management, compare CPU scheduling algorithms, and analyze synchronization mechanisms.

A3: Describe memory management strategies and page replacement algorithms, and evaluate fragmentation effects.

A4: Explain OS interaction with I/O devices, the role of kernel and drivers, and concepts of buses and interrupts.

B. Course-Specific Skill Objectives

B1: Apply CPU scheduling algorithms (e.g., FCFS, SJF, Round Robin) to practical scenarios.

B2: Use simulation tools to analyze process and memory management.

B3: Implement basic programs involving subprocesses, semaphores, or threads using C, Python, or Java.

B4: Design diagrams showing OS interaction with I/O systems, including buses, kernel layers, and interrupts.

C1: Appreciate the importance of OSs in building secure and efficient computing systems.
C2: Commit to ethical and efficient use of computing resources.
C3: Develop teamwork and collaboration in simulation or analysis projects.
C4: Demonstrate technical responsibility in understanding poor OS design consequences.

D. General and Transferable Skills (Employability and Personal Development)

D1: Develop analytical and problem-solving skills.
D2: Demonstrate ability to work under pressure in simulated environments.
D3: Gain proficiency in using development and simulation tools.
D4: Enhance communication and technical presentation skills.

11. Course Structure (Theory + Practical) – Computer Science

The week	**Hours**	**Learning Outcomes**	**Unit / Topic**	**Lecture + Practical Training**	**Presentation, Explanation, Q&A, Discussion**
1st	five hours	Define OS and its role as user-hardware intermediary	Introduction to OS Concepts	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

2nd	five hours	List core OS services: memory, process, I/O, security	OS Services	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
3rd	five hours	Explain caching, interrupts vs. exceptions, bus types	Caching, Interrupts, Buses	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
4th	five hours	Classify OS types (real-time, multitasking, etc.)	Types of OS	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
5th	five hours	Explain OS relation to hardware architecture	Computer Architecture	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
6th	five hours	Understand OS-I/O interaction and hardware roles	I/O Systems and Devices	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
7th	five hours	Kernel role in I/O and device driver interactions	Kernel I/O Management	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion

8th	five hours	Understand process management	Process Management Concepts	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
9th	five hours	Compare CPU scheduling algorithms	CPU Scheduling	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
10th	five hours	Evaluate scheduling	More on Scheduling	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
11th	five hours	Explain importance and techniques of process synchronization	Process Synchronization	Lecture + Practical Training	Presentation, Explanation, Q&A, Discussion
12th	five hours	Apply solutions to synchronization problems	Advanced Synchronization	a lecture + Practical training	Presentation, explanation, questions and answers, discussion
13th	five hours	Discuss memory management and allocation strategies	Memory Management	a lecture + Practical training	Presentation, explanation, questions and answers, discussion

14th	five hours	Analyze page replacement, frame allocation, fragmentation	Page Replacement and Fragmentation	a lecture + Practical training	Presentation, explanation, questions and answers, discussion
15th	five hours	Distinguish between physical and virtual memory management	Physical Memory	a lecture + Practical training	discussion

14. Infrastructure	
Required Textbooks:	"Operating Systems: Internals and Design Principles" – William Stallings
Main References (Sources):	"Operating System Concepts" – Abraham Silberschatz, Peter B. Galvin, Greg Gagne
Electronic References & Online Resources:	Web resources and educational sites

15. Admission Requirements	
Prerequisites:	**11. Classroom** **12. Laboratory** **13. Computers** **14. Whiteboard and Accessories** **15. Data Show Projector**

16. Course Development Plan

5. Update content to include modern OS technologies (e.g., Virtualization, Containers).
6. Strengthen the practical component with real-world simulations (e.g., Linux kernel, schedulers).

7. Integrate critical thinking and complex problem-solving into exercises and projects.
8. Align learning outcomes with professional standards such as ACM/IEEE Computing Curricula..