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

2025

Republic of Iraq

Ministry of higher education & scientific research

Supervision and scientific evaluation directorate

Quality assurance and academic accreditation

Academic Program Specification Form
For The Academic

University : Northern Technical University

College/Institute: Technical Institute of Mosul

Department: Networks and Computer Software Techniques

Date of form completion:

Assit.Prof. Dr. Ahmed Jadaan Ali
Vice Dean of Scientific Affairs
Date: 12 / 12 / 25
Signature

Assit.Prof. Dr. Shatha A. Baker
Head of Department
Date: 12 / 12 / 2025
Signature

Mohammed Khalid Yousif
Quality Assurance and University performance manager

Date: 2/12/2025
Signature

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عبد الناصر عبد الرزاق احمد
رئيس/عميد المعهد

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:

Program Structure	Number of Courses	Study Unit	Percentage	Notes *
University requirements	8	10	55%	4 Essential 2 optional
Institute requirements	4	10	35%	4 Essential
Department requirements	8	40	26%	8 Essential
summer training	3	completed	_____	
Other	/	There isn't any		

7- Program description

Year/level	Course or course code	Name of the course or course	Hours	
	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**
2025-2024/First	**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**

8- Expected learning outcomes of the programme

Knowledge:

- Understanding the fundamental concepts of computer networks, including protocols, network architecture, and cybersecurity.

- Comprehending programming principles and designing and developing software applications using modern programming languages.
- Gaining knowledge of operating system fundamentals, database management, data structures, and algorithms.
- Familiarity with modern tools and technologies used in network management and maintenance, web applications, and cloud computing.

Skills

1-Teamwork skills.
2- Computer and Internet skills
3-Communication skills such as English
4-Leadership skills and taking responsibility.
5-The student qualifies to pass recruitment interviews.

Value

1. Acquiring fundamental concepts and principles of networks and computer software, including network design, programming, and cybersecurity.
2. Analyzing technical problems faced by professionals in networking and software fields and developing innovative and effective solutions.
3. Evaluating proposed solutions for network and software issues and selecting the most optimal one based on performance, security, and efficiency standards.

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

المستوى الاول						
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 university 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 university units required**				
	60	**32**	**28**	**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	CPN107	Internet of Things (IoT)	2	3
First course	CPN100	C++ Programming	2	3
First course	NTU102	Computer Basics	1	1
First course	CPN103	Computer Organization	2	3
First course	NTU103	ARABIC LANGUAGE	2	-
First course	CPN106	Principles of Electrical Engineering	2	3
First course	NTU104	Sport	1	1
First course	MTI 100	Mathematics	2	-
First course	NTU 100	Democracy & Human Rights	2	-
Second course	NTU101	English Language	2	-
Second course	CPN102	Computer Architecture	2	3
Second course	CPN105	Computer Networks	2	3

Second course	NTU106	French Language	-	2
Second course	MTI 102	Engineering Drawing	-	2
Second course	MTI 103	Calculus	2	-
Second course	CPN101	Python Programming	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)

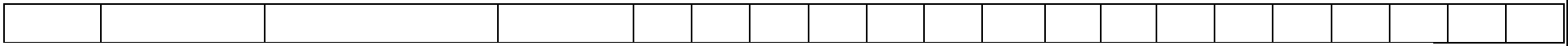
1- Academic average
2- Interest and preference
3- Relevant specialization in vocational high schools.

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

a plan skills The curriculum																	
Please situation signal in Squares The interview For outputs Learning Individuality from The program Subject For evaluation																	
				Outputs Learning Required from The program													
Year/ Level	Course Code	Course Name	Essential or Optinal	Cognitive Objectives				Program-Specific Skill Objectives				Affective and Value-Based Objectives				General and Transferable Skills (Employability and Personal Development)			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
First	CPN107	Internet of Things	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	CPN100	C++ Programming	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	NTU102	Computer	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	CPN103	Computer Organization	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	NTU103	**Arabic Language**	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	MTI 100	Mathematics	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

	NTU 100	Democracy & Human Rights	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	NTU101	English Language	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	CPN102	Computer Architecture	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	CPN105	Computer Networks	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	NTU106	French Language	**Optional**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	MTI 102	Engineering Drawing	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	MTI 103	Calculus	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	CPN101	Python Programming	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	NTU 104	**Sport**	**Optional**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	CPN 106	**Principle of Electrical Engineering**	**Essential**	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√



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,	C++ Basics and Data Types	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-

		float, char, string). 2 .Writing simple programs using variables in C.++			lecture questions
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	Mathematical & Programming Equations + Selection Statements	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions

		decision-making in programs.			
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,	1. Writing basic **for** loops for executing	Loop Statements (Continued)	Presentation, Lecture, Q&A,	Short quizzes, End-of-

	3 Practical	repetitive operations. 2. Implementing nested loops for handling complex operations like pattern printing or data table processing.		Discussion, Homework	lecture questions
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	Control Statements & Go-To Looping	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions

		iterations in a loop.			
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 + General Review	Presentation, Lecture, Q&A, Discussion, Homework	Short quizzes, End-of-lecture questions

		functions, setting return 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 / 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 – C++ Programming**

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.

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.

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

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

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	Annual
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.

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	Annual
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	Discussion method, lecture method	Oral test

			2. Differentiate between noun and verb 3. Indication of the types of verb 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	Discussi on	Oral test

			administrative discourse	method, lecture method	
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	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	Annual
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

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 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