Ministry of Higher Education and Scientific

Research Apparatus for Educational

Supervision and Scientific Evaluation

Quality Assurance and Academic Accreditation Directorate

AccreditationDepartment

Academic Program and Course Description Guide

2025

Introduction:

An academic program is a coordinated, organized package of courses comprising procedures and experiences arranged as curricular items whose primary purpose is to build and refine graduates' skills, qualifying them to meet labor-market requirements. It is reviewed and evaluated annually through internal or external quality-assurance procedures and programs, such as the external examiner program.

The academic program description provides a concise summary of the program's key features and its courses, indicating the skills students are meant to acquire in line with the program's objectives. The importance of this description lies in being the cornerstone for obtaining program accreditation; it is co-authored by the teaching staff under the supervision of the scientific committees in the academic departments.

This second edition of the guide contains a description of the academic program after updating the items and sections of the previous guide in light of recent developments in Iraq's education system. It includes the academic program description in its traditional form (annual, semester-based system), as well as the standard academic program description circulated under Studies Department letter No. 3/2906 dated 3/5/2023, for programs based on the Bologna Process.

In this regard, we must stress the importance of writing academic program and course descriptions to ensure the sound conduct of the educational process.

Concepts and Terms:

Academic Program Description: Provides a concise summary of the program's vision, mission, and objectives, including a precise description of the targeted learning outcomes in accordance with defined learning strategies.

Course Description: Provides a concise summary of the course's most important features and the learning outcomes the student is expected to achieve, demonstrating whether maximum benefit has been gained from the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious image of the program's future, aspiring for it to be advanced, inspiring, motivating, realistic, and practicable.

Program Mission: Concisely explains the objectives and activities necessary to achieve them, and defines the program's development paths and directions.

Program Goals: Statements describing what the academic program intends to achieve within a specific period; they must be measurable and observable.

Curriculum Structure: All the courses/subjects included in the academic program under the adopted learning system (courses), whether they are ministry, university, college, or department requirements, along with the number of credit units.

Learning Outcomes: A coherent set of knowledge, skills, and values acquired by the student upon successful completion of the academic program. Learning outcomes must be defined for each course in a manner that achieves the program's objectives.

Teaching and Learning Strategies: The strategies used by faculty members to develop student teaching and learning; they are plans followed to reach learning objectives, i.e., they describe all in-class and out-of-class activities used to achieve the program's learning outcomes.

University Name: Northern Technical University
College/Institute: Hawija Technical Institute
Scientific Department: Mechanical Technologies
Name of academic or professional program: Diploma in Mechanical Technologies
Final Certificate Name: Diploma in Mechanical Engineering
Study system: Courses
Description prepared on: 1/10/2025
Date the description was filled: 1/10/2025

Department Head: Assistant Prof Suhel Najm Shehab
Date: 1/10/2025

Assistant Dean for Scientific Affairs: Dr. Mohammed Ali Fares
Date: 1/10/2025

The file was reviewed by
Quality Assurance and University Performance Division
:Name of the Director of the Quality Assurance and University Performance Division
Mr. Ahmed Abdel Khalaf
Date: 1/10/2025

Dean's approval
Prof. Dr. Omar Khalil

1- Program Vision

Achieving excellence and leadership in computer network information technology, providing society with effective mid-level technical cadres in computer network systems, developing their capabilities in computer software, and developing their interaction and communication skills to reach a digital society under e-government.

2- Program Mission

Providing distinguished education in computer networks and software in accordance with international standards, producing creative research that serves higher education, and providing technical consultations to raise the performance level of society.

3- Program Goals

- Preparing scientifically and academically qualified cadres suited to the labor market and the needs of digital-development fields.
- Encouraging scientific research in theoretical and applied sciences, supporting future research, and the continuous development of curricula in line with contemporary knowledge, methodological, and technical innovations.
- Participating in community service through direct and continuous interaction with governmental and non-governmental institutions, providing scientific consultations, and strengthening continuing-education programs.

4- Program Accreditation

The department was newly established for the 2024-2025 academic year; application for program accreditation will take place after two graduating cohorts.

5- Other External Influences

The presence of a sponsoring body that contributes to:
Linking the program to the labor market or the community
Facilitating employment and practical training
Providing continuous guidance for the program

6- Program Structure

Program Structure	Number of Courses	Credit Units	Percentage	Notes *
University Requirements	10	20	(10-15)%	Core course
College Requirements	7	14	(16-22)%	Core and non-core
Department Requirements	19	54	(63-74)%	Core and non-core
Summer Training	Starts 1/7 and ends 1/9 in the first level			Pass/Fail

7 - Program Description		First Level / First Semester + Second Semester						
Course Type	Code	Prerequisite (if any)	Credit Units	Practical Hours	Theoretical Hours	Course Name		Requirement Type
						In English	In Arabic	
Compulsory	NTU100		2	-	2	Human Rights and Democracy	Human Rights and Democracy	University Requirements
Compulsory	NTU101		2	-	2	English Language	English Language 1	
Compulsory	NTU102		2	1	1	Computer	Computer	
Compulsory	NTU103		2	-	2	Arabic Language	Arabic Language	
Compulsory	TIHA100		2		2	Mathematics	Mathematics	College Requirements
Compulsory	TIHA 102		2	2		Engineering Drawing	Engineering Drawing	
Compulsory	TIHA 103		2		2	Differential and Integral Calculus	Differential and Integral Calculus	
Compulsory	CPN 100		5	3	2	Programming with C++	Programming with C++	Department Requirements
Compulsory	CPN 103		5	3	2	Computer Organization	Computer Organization	
Compulsory	CPN 104		5	3	2	Electronic Principles	Electronic Principles	
Compulsory	CPN 105		5	3	2	Basics of Computer Networks	Basics of Computer Networks	
Compulsory	CPN 101		5	3	2	Python Programming	Python Programming	
Compulsory	CPN 102		5	3	2	Computer Architecture	Computer Architecture	
Compulsory	CPN 106		5	3	2	Principles of Electrical Engineering	Principles of Electrical Engineering	

Compulsory	CPN 107		5	3	2	Internet of Things	Internet of Things	
			56	27	29	Total		

Second Level / First Semester + Second Semester								
Course Type	Code	Prerequisite (if any)	Credit Units	Number Practical Hours	Number Theoretical Hours	Course Name		Requirement Type
						In English	In Arabic	
Compulsory	NTU200		2	1	1	Computer Computer Applications 2	Principles of Computer 2	University Requirements
Compulsory	NTU201		2	-	2	English Language	English Language 2	
Compulsory	NTU202		2	-	2	Arabic Language 2	Arabic Language	
Compulsory	NTU203		2	-	2	The Crimes of the Baath Regime in Iraq	Crimes of the Baath Regime in Iraq	
Compulsory	NTU204		2	-	2	Professional Ethics	Professional Ethics	
Compulsory	TIHA 200		2	2		Project	Project	College Requirements
Compulsory	TIHA 202		2	2		Practical Project	Practical Project	
Compulsory	TIHA 201		3	3		Workshop	Specialized Workshop	
	TIHA 203		2		2	Occupational Safety	Occupational Safety	
Compulsory	CPN 200		5	3	2	Database	Database	Department Requirements
Compulsory	CPN 202		5	3	2	Network Management	Network Management	
Compulsory	CPN 206		5	3	2	Operating Systems	Operating Systems	
Compulsory	CPN 201		5	3	2	Encryption and Computer Security	Encryption and Computer Security	
Compulsory	CPN 203		5	3	2	Website Design	Website Design	
Compulsory	CPN 204		5	3	2	Website Programming	Website Programmin	

							g
Compulsory	CPN 205		5	3	2	Programming with Visual Basic	Programming with Visual Basic
			54	29	25	Total	

Program Expected Learning Outcomes

Knowledge

1. Explain the basic concepts of network engineering technologies and computer software.
2. Clarify the principles of designing, implementing, and managing wired and wireless computer networks.
3. Gain familiarity with modern programming languages, software engineering, and system-development methodologies.
4. Understand the architecture of operating systems, databases, cloud computing, and the Internet of Things.
5. Grasp the principles of cybersecurity, information security, and encryption technologies.
6. Know the standards and protocols used in computer networks and communications.

Skills

By the end of the program, the graduate will be able to:

1. Design and implement computer networks in accordance with international standards.
2. Install, configure, and manage network devices such as switches and routers.
3. Develop software applications using appropriate programming languages.
4. Design and manage databases and connect them to various applications.
5. Diagnose network and software faults and propose appropriate solutions.
6. Apply cybersecurity procedures to protect systems and networks.
7. Use simulation tools and engineering software to design and test networks.
8. Execute comprehensive technical projects combining software and networks.

Values

- Use specialized engineering software in network design.
- Employ software project-management tools.
- Use version-control systems (Git).
- Apply cloud computing and digital services.
- Employ artificial-intelligence tools in software development and data analysis.

Teaching and Learning Strategies

- Theoretical learning: lectures, textbooks
- Practical learning: field and laboratory training, practical workshops.
- Project-based learning
- Cooperative learning: encouraging students to work in teams on graduation projects and group discussions
- Use of technology: using e-learning platforms
- Professional training: providing professional training opportunities using modern techniques.
- Continuous assessment: periodic assessment of students to measure their progress, and feedback to improve their performance
- Learning through experience: scientific experiments, learning from mistakes and improving performance.

Assessment Methods
(weekly exams, homework, monthly and daily technical reports, discussions, field training, and the end-of-course exam)

Teaching Staff						
Faculty Members						
Academic Rank	Specialization		Requirements/Special Skills (if any)		Faculty Numbers	
	General	Special			Faculty (staff)	Lecturer
Assistant Professor	Communications Engineering	Communications Engineering			Yes	
Lecturer (Instructor)	Information Engineering				Yes	
Lecturer (Instructor)	Electrical Engineering				Yes	
Lecturer (Instructor)	Arabic Language				Yes	

Assistant Lecturer	Solid State Physics				Yes	
Technical Staff						
Diploma					Yes	
Diploma					Yes	

Professional Development
Mentoring new faculty members
Training courses, workshops, and seminars in the field of networks Courses, workshops, and seminars on teaching and learning Courses, workshops, and seminars on laboratory equipment Courses, workshops, and seminars on how to publish scientific research
Professional Development for Faculty Members
Training courses, workshops, and seminars in the field of networks Developing scientific-publishing skills

Admission Criteria
The criteria adopted for central admission by the Ministry of Higher Education and Scientific Research

Key Sources of Information about the Program
The National Qualifications Framework (NQF) Academic accreditation standards Vision and mission of the educational institution, previous study plans Opinions and observations of faculty members Opinions of students and graduates Feedback from employers Similar programs at local and international universities Needs of the local and international labor market

Program Development Plan
First: Vision and Mission Vision: Advancing the network technologies program to become a leading program in preparing technical cadres capable of developing software. Mission:

Qualifying graduates who possess theoretical knowledge and applied skills in the field of networks and computer software.

Second: Development Goals

- Updating curricula
- Strengthening the practical, applied, and laboratory aspects.

Third: Curriculum Development

- Adding modern courses such as:
    1- Artificial Intelligence.
    2- Robotics Programming

Fourth: Teaching Staff

- Encouraging faculty members to:
    - Participate in modern training courses
    - Conduct applied scientific research
- Attract experts from the labor market as visiting instructors.

Sixth: Scientific Research and Innovation

- Supporting applied student projects.
- Cooperating with research centers.
- Publishing research in peer-reviewed scientific journals.

Seventh: Linking to the Labor Market

- Signing memoranda of understanding with:
    - Software companies
    - Investment projects
- Establishing an advisory committee from the labor market to evaluate the program.
- Following up on department graduates (tracer study) to improve outcomes.

Eighth: Infrastructure and Equipment

- Updating laboratories
- Providing modern equipment such as:
    - Humidity and temperature sensors
- Developing the print and electronic library.

Ninth: Quality Assurance and Evaluation

- Applying academic accreditation standards.
- Periodic evaluation of the program every one to two years.
- Surveys to measure the satisfaction of students and employers.
- Reviewing learning outcomes.

Program Skills Map

Program Skills Map															
Learning Outcomes Required of the Program												Core or Elective	Course Name	Course Code	Year/Level
Values				Skills				Knowledge							
C4	C3	C2	C1	B4	B3	B2	B1	A4	A3	A2	A1				
✓	✓	✓	✓		✓		✓		✓	✓	✓	Core	Democracy and Human Rights	NTU100	First Level
✓		✓	✓		✓	✓	✓			✓	✓	Core	English Language	NTU101	
		✓	✓	✓		✓	✓		✓	✓	✓	Core	Computer	NTU102	
✓		✓	✓		✓		✓			✓	✓	Core	Arabic Language	NTU103	
		✓	✓			✓	✓	✓	✓	✓	✓	Core	Mathematics	NCSET108	
		✓	✓	✓		✓	✓	✓	✓	✓	✓	Core	Computer Organization	NCSET103	
✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	Core	Programming in C	NCSET100	
		✓	✓	✓		✓	✓	✓	✓	✓	✓	Core	Electronics	NCSET104	
✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Core	Basics of Computer Networks	NCSET105	
✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	Core	Python Programming	NCSET101	
		✓	✓			✓	✓	✓	✓	✓	✓	Core	Computer Architecture	NCSET102	
		✓	✓	✓		✓	✓	✓	✓	✓	✓	Core	Electrical Engineering	NCSET106	
✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Core	Internet of Things	NCSET107	
		✓	✓	✓		✓	✓		✓	✓	✓	Core	Engineering Drawing	NCSET109	
✓		✓	✓		✓	✓	✓			✓	✓	Core	English Language	NTU200	Second Level
✓	✓	✓	✓		✓		✓	✓		✓	✓	Core	Crimes of the Baath Regime in Iraq	NTU203	
✓		✓	✓		✓		✓		✓	✓	✓	Core	Arabic Language	NTU202	
		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Core	Network Management	NCSET200	
✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	Core	Website Design	NCSET201	
		✓	✓	✓		✓	✓	✓	✓	✓	✓	Core	Operating Systems	NCSET202	
		✓	✓	✓		✓	✓		✓	✓	✓	Core	Digital Circuits	NCSET203	

Program Skills Map

Learning Outcomes Required of the Program												Core or Elective	Course Name	Course Code	Year/Level
Values				Skills				Knowledge							
C4	C3	C2	C1	B4	B3	B2	B1	A4	A3	A2	A1				
✓	✓	✓	✓		✓			✓		✓	✓	Core	Professional Ethics	**NTU204**	
		✓	✓	✓		✓	✓		✓	✓	✓	Core	Computer	**NTU201**	
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Core	Information and Network Security	**NCSET204**	
✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	Core	Website Programming	**NCSET205**	
	✓	✓	✓		✓	✓		✓	✓	✓	✓	Core	Introduction to Governance	**NCSET206**	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		Core	Project 1	**NCSET207**	

Human Rights and Democracy Course Description
1- Course Name
Human Rights and Democracy
2- Course Code
NTU 100
3- Semester / Year
2025 – 2026 First Level, First Semester
4- Available Attendance Forms
Traditional attendance (in-person), blended learning
5- Total Teaching Hours / Total Credit Units
30 hours / 2 units
6- Date of Preparing this Description
8/9/2025
7- Name of Course Coordinator
Name: Asst. Prof. Dr. Raad Hamza Awad Asst. Lect. Hamza Omar Sadiq Email: raadawad_hwj@ntu.edu.iqhamzaomer_hwj@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
1. Introduce the student to the basic concepts of human rights and democracy. 2. Enhance awareness of human values, justice, and freedom. 3. Understand the legal and international legitimacy foundations of human rights. 4. Link the principles of democracy to public and institutional life practices.
9- Course Outcomes and Teaching, Learning, and Assessment Methods
A- Knowledge Objectives A1- Identify the basic concepts related to human rights and democracy. A3- Analyze legal texts related to public rights and freedoms. B- Course-Specific Skill Objectives. B1- Discuss rights-related issues from a legal and humanitarian perspective. B2- Evaluate various democratic practices within the local and international context. C- Affective and Value Objectives C3- Promote human values, tolerance, and acceptance of others. C4- Develop a sense of responsibility toward respecting rights and community participation.
- Teaching and Learning Methods
Intensive theoretical lessons, data projector with educational films
- Assessment Methods
Commitment to and regularity of attendance, reports, in-class discussions, daily and monthly exams, end-of-semester exam

10- Course Structure Human Rights and Democracy (Theoretical Content)					
Week	**Hours**	**Required Learning Outcomes**	**Unit / Topic Name**	**Teaching Method**	**Assessment Method**
1	2	The student defines the concept of human rights and explains its basic objectives.	Human rights: definition and objectives.	Theoretical	Monthly exams and a final exam
2	2	The student explains the historical development of the idea of rights throughout the ages.	The roots of human rights and their development in human history; human rights in ancient and medieval times.	Theoretical	Monthly exams and a final exam
3	2	The student shows how the principles of human rights emerged in ancient societies.	Human rights in the civilization of Mesopotamia.	Theoretical	Monthly exams and a final exam
4	2	The student cites examples from ancient texts and laws (such as the Code of Hammurabi) that addressed human rights.	Human rights in the divine religions, with a special study of human rights in Islam.	Theoretical	Monthly exams and a final exam
5	2	The student explains how the divine religions addressed human rights, especially in Islam.	Human rights in the Middle Ages; rights in doctrines, schools of thought, theories, and the declarations and constitutions of nations.	Theoretical	Monthly exams and a final exam
6	2	The student describes how philosophies and schools of thought dealt with rights.	Human rights in contemporary and modern history; international recognition of human rights in the League of Nations and the United Nations.	Theoretical	Monthly exams and a final exam
7	2	The student learns about the role of the League of Nations and the United Nations in	Regional recognition of human rights; the 1950 European	Theoretical	Monthly exams and a final exam

		recognizing human rights.	Convention on Human Rights; the 1969 American Convention.		
8	2	- The student distinguishes between democratic and non-democratic systems - Learns about the characteristics of a democratic system	Introduction to Democracy - Definition of democracy - Difference between democratic and non-democratic systems	Theor etical	Monthly exams and a final exam
9	2	- The student identifies types of democracy and their examples - Explains the differences between them	Types of Democracy - Direct democracy - Representative democracy - Participatory democracy	Theor etical	Monthly exams and a final exam
10	2	- The student explains the basic principles of any democratic system - Links the principles to human values	Basic Principles of Democracy - Majority rule - Rule of law - Respect for rights and freedoms	Theor etical	Monthly exams and a final exam
11	2	- The student recognizes his/her role as a citizen - Expresses the importance of participation in public life	Active Citizenship - Concept of citizenship - Citizen's duties and rights - Participation in public life	Theor etical	Monthly exams and a final exam
12	2	- The student links democracy to the guarantee of rights - Analyzes the importance of freedom of opinion in democratic systems	Democracy and Human Rights - The relationship between democracy and rights protection - Freedom of expression, assembly, and organization	Theor etical	Monthly exams and a final exam
13	2	- The student explains the functions of each institution - Understands the balance of powers	Institutions of the Democratic System - Parliament - Judiciary - Media - Civil-society organizations	Theor etical	Monthly exams and a final exam

14 - 15	2	- The student explains the functions of each institution - Discusses the obstacles to building a democratic system	Institutions of the Democratic System Challenges Facing Democracy	Theoretical	Monthly exams and a final exam

Course Development Plan

- Updating the course content to keep pace with developments in the field of human rights.
- Developing students' awareness of human-rights principles and social responsibility.
- Strengthening critical-thinking, legal-analysis, and dialogue skills.
- Improving the use of modern technologies in teaching and assessment.

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Weeks One and Two	2.5	2.5
2	Discussion and dialogue	Weeks Three and Four	2.5	2.5
3	Quiz (1)	Weeks Five and Six	2	2
4	Quiz (2)	Weeks Seven and Eight	2	2
5	Report 2	Weeks Nine and Ten	1	1
6	Term Exam (1)	Weeks Eleven and Twelve	7.5	7.5
7	Term Exam (2)	Weeks 13-14-15	7.5	7.5
8	Coursework total	Coursework total	40	40
9	Final theoretical exam	End-of-semester exams	60	60
	Total	100	100%	100%

12- Teaching and Learning Resources	
1- Required Textbooks	• Human Rights and Democracy – Ministry of Higher Education and Scientific Research, Iraq (approved textbook). • Human Rights – a group of authors, Dar Al-Kutub Al-Ilmiyah. Democracy and Human Rights – an approved academic author, in accordance with the department's or college's requirements.
2- Main References (Sources)	• The Universal Declaration of Human Rights (1948). • The Arab Encyclopedia of Human Rights, or any recent

	academic reference in the field of human rights and democracy.
A- Recommended Books and References (Scientific journals, reports, etc.)	Human Rights, Dr. Mohammed Nour Farahat Introduction to Human Rights, Dr. Mahmoud Cherif Bassiouni Democracy and Human Rights, Dr. Abdelilah Belkeziz
B- Electronic References, Websites	Website of the Office of the United Nations High Commissioner for Human Rights (OHCHR) United Nations website – Human Rights

English Language Course Description

The English Language course at technical institutes aims to provide students with basic English-language skills that serve their academic specialization and help them in the labor market.
1- Course Name
English Language
2- Course Code
NTU 101
3- Semester / Year
2025 – 2026 First Level, First Semester
4- Available Attendance Forms
Traditional attendance (in-person) 2. Blended learning
5- Total Teaching Hours / Number of Credit Units
30 hours / 2 units
6- Date of Preparing this Description
8/9/2025
7- Name of Course Coordinator
Name: Asst. Lect. Ahmed Ibrahim Khalaf Email:ahmedibrahim.haw@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
1. Developing the student's basic English-language skills: listening, speaking, reading, and writing. 2. Enhancing the student's ability to use English in everyday and professional life situations. 3. Introducing the student to English terminology related to his/her specialization.
9- Course Outcomes and Teaching, Learning, and Assessment Methods
A- Knowledge Objectives A1- Identify basic vocabulary and terminology related to daily life and his/her professional specialization. A2- Distinguish between different tenses and use them in correct sentences. A3- Differentiate English sentences in terms of subject, verb, and object.
B- Course-Specific Skill Objectives.

B1- Form correct sentences.
B2- Pronounce English words and terms correctly and clearly.
B3- Write a paragraph or short letter in correct language.
C- Affective Objectives:
C1- The student shows interest in learning English and using it in academic and professional situations.
C2- The student appreciates the importance of English as a means of communication and knowledge exchange globally.
C3- The student shows a positive attitude toward continuously developing his/her language skills.

- Teaching and Learning Methods

Intensive theoretical lessons, data projector with educational films

- Assessment Methods

Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam

10- Course Structure English Language (Theoretical Content)

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	2	Identify and use the verb am/are/is correctly in simple sentences. Use the pronouns my/your to describe basic personal information.	Unit One: Hello — Am/are/is, my/your, This is (with practice in class)	Theoretical	Diagnostic, formative, and summative
2	2	Use subject pronouns he/she/they and possessive adjectives his/her accurately. Form and answer basic yes/no and wh- questions using "to be."	Unit Two: Your World — He/she/they, his/her, Questions	Theoretical	Diagnostic, formative, and summative
3	2	Provide simple personal information (e.g., age, nationality, likes/dislikes). Respond to personal questions using correct sentence structures.	Unit Three: All About Me	Theoretical	Diagnostic, formative, and summative
4	2	Use possessive adjectives and possessive 's to talk about relationships and belongings. Use has/have correctly with singular and plural nouns.	Unit Four: Family and Friends — Possessive adjectives, Possessive 's, Has/have, Adjective + noun	Theoretical	Diagnostic, formative, and summative
5	2	Use the present simple tense with I/you/we/they to describe routines. Use articles a/an correctly. Create descriptive phrases using adjective + noun structure	Unit Five: The Way I Live — Present simple I/you/we/they, A and an, Adjective + noun	Theoretical	Diagnostic, formative, and summative

6	2	Use the present simple tense with he/she and form questions and negatives. Use adverbs of frequency (e.g., always, usually, never) to describe daily habits.	Unit Six: Every Day — Present simple he/she, Questions and negatives, Adverbs of frequency	Theoretical	Diagnostic, formative, and summative
7	2	Use question words (e.g., what, who, where) to ask for specific information. Distinguish between subject and object pronouns.	Unit Seven: My Favorites — Question words, Pronouns, This and that	Theoretical	Diagnostic, formative, and summative
8	2	Describe a place using There is/There are and common prepositions of place. Talk about furniture, rooms, and locations using basic vocabulary.	Unit Eight: Where I Live — There is/are..., Prepositions	Theoretical	Diagnostic, formative, and summative
9	2	Use was/were born to describe personal history. Recognize and use common irregular verbs in the past simple tense.	Unit Nine: Times Past — Was/were born, Past simple irregular verbs	Theoretical	Diagnostic, formative, and summative
10	2	Use past simple tense for both regular and irregular verbs to describe past events. Form questions and negatives in the past tense. Use the time expression ago to talk about past events.	Unit Ten: We Had a Great Time! — Past simple regular & irregular, Questions, Negatives, Ago	Theoretical	Diagnostic, formative, and summative
11	2	Use can/can't to express ability and permission. Use adverbs to describe how something is done (e.g., quickly, well).	Unit Eleven: I Can Do That! — Can/can't, Adverbs, Requests	Theoretical	Diagnostic, formative, and summative
12	2	Use some/any in affirmative and negative sentences. Express preferences using like and would like.	Unit Twelve: Please, I'd Like... — Some and any, Like and would like, and thank you	Theoretical	Diagnostic, formative, and summative
13	2	Use the present continuous tense to describe current actions. Distinguish between present simple and present continuous in context.	Unit Thirteen: Here and Now — Present continuous, Present simple & present continuous	Theoretical	Diagnostic, formative, and summative
14-15	2	Make and talk about future plans using simple future expressions (e.g., going to).	It's Time to Go! — Future plans, Revision, writing an	Theoretical	Diagnostic, formative, and

		Review and consolidate key grammar and vocabulary from previous units. Write an email and an informal letter using appropriate format and language.	email and an informal letter		summative

Curriculum Development Plan

- Improving listening, speaking, reading, and writing skills.
- Developing vocabulary and basic grammar.
- Enhancing students' ability to communicate in English in various situations.
- Employing technology in teaching English.
- Developing critical-thinking and self-learning skills.

11- Course Assessment				
No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Weeks One and Two	2.5	2.5
2	Report 2	Weeks Three and Four	2.5	2.5
3	Quiz (1)	Weeks Five and Six	2	2
4	Quiz (2)	Weeks Seven and Eight	2	2
5	Quiz (3)	Weeks Nine and Ten	1	1
6	Term Exam (1)	Weeks Eleven and Twelve	7.5	7.5
7	Term Exam (2)	Weeks 13-14-15	7.5	7.5
8	Coursework total	Coursework total	40	40
9	Final theoretical exam	End-of-semester exams	60	60
	Total	100	100%	100%

12- Teaching and Learning Resources	
Classrooms, laboratories, and workshops	Available
1- Required Textbooks	New Headway (Beginner to Pre-Intermediate)
2- Main References (Sources)	Liz and John Soars - Oxford
A- Recommended Books and References (Scientific journals, reports, etc.)	Cutting Edge - Longman / Pearson
B- Electronic References, Websites	https://learnenglish.britishcouncil.org

Computer Principles Course Description
1- Course Name
Computer Principles
2- Course Code
NTU 102
3- Semester / Year
2025-2026, First Level, First Semester
4- Available Attendance Forms
Traditional attendance (in-person) 2. Blended learning
5- Total Teaching Hours / Number of Credit Units
30 hours / 2 units
6- Date of Preparing this Description
8/9/2025
7- Name of Course Coordinator
Name: Asst. Lect. Mustafa Fereydun Faiq Email:Mustafa.f.f.hti@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
This course aims to provide the student with basic knowledge in the field of computers and information technology, and to enable him/her to use the computer and its basic applications in academic and professional life.
9- Course Outcomes and Teaching, Learning, and Assessment Methods
A- KNOWLEDGE OBJECTIVES A1- DISTINGUISH BETWEEN DIFFERENT TYPES OF SOFTWARE (OPERATING SYSTEMS, APPLICATIONS, ANTIVIRUS). A4- EXPLAIN THE STEPS FOR USING THE BASIC OFFICE-SUITE PROGRAMS WORD, EXCEL, AND POWERPOINT.
B- COURSE-SPECIFIC SKILL OBJECTIVES. B1- EDIT DOCUMENTS USING MICROSOFT WORD WITH PROFESSIONAL FORMATTING. B2- CREATE SPREADSHEETS AND APPLY SIMPLE FORMULAS USING EXCEL. C- Affective Objectives: C1- The student shows interest in learning computer-usage skills and its various applications. C2- The student appreciates the importance of computers and information technology in advancing education and scientific research. C4- The student adheres to the ethics of using computers and the Internet and respects intellectual-property rights.
- Teaching and Learning Methods
Intensive theoretical lessons, data projector with educational films, practical lessons in the computer lab
- Assessment Methods
Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam

10- Course Structure Computer Principles (Theoretical Content)					
Week	**Hours**	**Required Learning Outcomes**	**Unit / Topic Name**	**Teaching Method**	**Assessment Method**
1	2	The student learns the basic components of the computer and its importance in daily and professional life.	Introduction to Computers	Theoretical + Practical	Diagnostic - Formative - Summative
2	2	The student distinguishes between application software and system software.	Types of Software	Theoretical + Practical	Diagnostic - Formative - Summative
3	2	The student explains the function of operating systems and compares their various types.	Operating Systems	Theoretical + Practical	Diagnostic - Formative - Summative
4	2	The student creates and edits documents using word-processing software.	Word Processing (Microsoft Word)	Theoretical + Practical	Diagnostic - Formative - Summative
5	2	The student uses spreadsheets to perform simple calculations.	Spreadsheets (Microsoft Excel)	Theoretical + Practical	Diagnostic - Formative - Summative
6	2	The student designs a presentation using the program's various tools.	Presentations (Microsoft PowerPoint)	Theoretical + Practical	Diagnostic - Formative

					- Summative
7	2	The student uses the Internet and email effectively and safely.	Internet and Email	Theoretical + Practical	Diagnostic - Formative - Summative
8	2	The student learns how to organize files and folders on the computer.	Working with Files	Theoretical + Practical	Diagnostic - Formative - Summative
9	2	The student learns the basics of information protection and securing devices and data.	Cybersecurity	Theoretical + Practical	Diagnostic - Formative - Summative
10	2	The student acquires basic programming concepts using a simple language such as Scratch or Python.	Basic Programming	Theoretical + Practical	Diagnostic - Formative - Summative
11	2	The student explains database concepts and how to work with them.	Database	Theoretical + Practical	Diagnostic - Formative - Summative
12	2	The student learns the types of input and output devices and their functions.	Input and Output Devices	Theoretical + Practical	Diagnostic - Formative - Summativ

					e
13	2	The student learns how to prepare a document for printing and adjust printer settings.	Printing and Settings	Theoretical + Practical	Diagnostic - Formative - Summative
14	2	The student applies the acquired skills in preparing a simple computer project.	Practical Project	Theoretical + Practical	Diagnostic - Formative - Summative
15	2	The student reviews the concepts and skills and prepares for the final exam.	Review and Final Exam	Theoretical + Practical	Diagnostic - Formative - Summative

13- Curriculum Development Plan

- Developing digital literacy among students.
- Developing skills in using computers and basic programs.
- Strengthening logical thinking and problem-solving.
- Teaching the basics of programming and artificial intelligence.
- Developing research and self-learning skills via the Internet.
- Strengthening cybersecurity and digital ethics.

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	50	50
9	Practical field	Week Fifteen	5	5

	project			
10	Practical assessment	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	10	10
	Total	100	100%	100%

13- Teaching and Learning Resources	
Classrooms, laboratories, and workshops	Available
1- Required Textbooks	Computer Fundamentals, Dr. Ismail Abdullah Hamid
2- Main References (Sources)	Computer Principles - Mu'tasim Mohammed Al-Nour
A- Recommended Books and References (Scientific journals, reports, etc.)	Computer Basics - Qais Al-Hadi Babiker Al-Hadi
B- Electronic References, Websites	•Cisco Networking Academy •Google for Education •GCFGlobal (Computer Basics)

Arabic Language Course Description
1- Course Name
Arabic Language
2- Course Code
NTU 103
3- Available Attendance Forms
Traditional attendance (in-person) 2. Blended learning
4- Semester / Year
2025-2026, First Level, First Semester
5- Total Teaching Hours / Total Credit Units
30 hours / 2 units
6- Date of Preparing this Description
1/10/2025
7- Name of Course Coordinator
Name: Asst. Prof. Dr. Qutaiba Saleh Sheikh Email:Qotaibah_hwj@ntu.edu.iq
8- Course Objectives (General Objectives of the Course).

This course aims to develop the student's language skills in comprehension, expression, and writing in Modern Standard Arabic, and to enable him/her to use the language correctly in academic and professional contexts, with a focus on written and oral communication skills in the workplace.

9- Course Outcomes and Teaching, Learning, and Assessment Methods

A- Knowledge Objectives

A1- Give five examples of the connecting hamza and the cutting hamza.

A2- Distinguish between the closed ta' (taa marbuta) and the letter ha.

B- Course-Specific Skill Objectives.

B1- Write a ten-line composition.

B2- How to distinguish between the letters Dad and Zaa.

C- Affective Objectives:

C2- Developing a positive attitude toward using Modern Standard Arabic in oral and written communication.

C3- Adhering to communication ethics and respecting others' opinions during dialogue and discussion.

- Teaching and Learning Methods

Intensive theoretical lessons, data projector with educational films

- Assessment Methods

Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam

10- Course Structure Arabic Language (Theoretical Content)

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	2	Distinguishes between the closed ta', the open ta', and the long ta' in terms of form and function. Corrects common errors in the use of the different forms of ta' in Arabic words.	Introduction to language errors - the closed, long, and open forms of ta'	Theoretical	Formative and summative
2	2	Differentiates between the elongated alif (ا) and the shortened alif (ى) in written usage. Applies the rules of writing alif according to its position and linguistic origin.	Rules for writing the elongated and shortened alif - solar and lunar letters	Theoretical	Formative and summative

3	2	Identifies the solar and lunar letters. Uses the definite article "al" correctly according to the type of the first letter in the word.	The Letters Dad and Zaa	Theoretical	Formative and summative
4	2	Differentiates between the sounds of Dad and Zaa in terms of pronunciation and usage. Corrects common errors in writing words containing either letter.	Writing the Hamza	Theoretical	Formative and summative
5	2	Learns the types of hamza (cutting, connecting, medial, final). Applies the correct spelling rules for writing the hamza in its different positions.	Punctuation Marks	Theoretical	Formative and summative
6	2	Identifies the types of punctuation marks and their uses. Uses punctuation marks accurately in writing to improve clarity of meaning.	The Noun and the Verb, and Distinguishing Between Them	Theoretical	Formative and summative
7	2	Distinguishes between the noun and the verb in terms of meaning and structure. Classifies words in sentences according to their type: noun, verb, or particle.	The Objects (Maf'ul Categories)	Theoretical	Formative and summative
8	2	Explains the types of objects (maf'ul) and their functions in the sentence. Analyzes sentences to identify the different types of objects.	Numbers	Theoretical	Formative and summative
9	2	Distinguishes between numbers by type (single, compound, conjoined) and agreement. Applies the rules of numbers and counted nouns correctly in various contexts.	Applications on Common Language Errors	Theoretical	Formative and summative
10	2	Learns the most common language errors in writing and expression. Corrects common language errors through practical activities and examples.	The Letter Nun and Tanween - The Meanings of Prepositions	Theoretical	Formative and summative
11	2	Differentiates between the letter	Formal Aspects of	Theore	Formativ

		nun and tanween in terms of pronunciation and function. Explains the meanings of prepositions in different contexts.	Administrative Correspondence	tical	e and summati ve
12	2	Learns the basic formal components of administrative letters. Adheres to the formal elements when writing an administrative letter (letterhead, title, date, signature, etc.).	The Language of Administrative Correspondence	Theore tical	Formativ e and summati ve
13 - 14	2	Uses formal, direct language appropriate to the nature of administrative correspondence. Avoids colloquial expressions and grammatical errors when writing formal letters.	Introduction to language errors - the closed, long, and open forms of ta'	Theore tical	Formativ e and summati ve
15	2	Analyzes various models of administrative correspondence (request, complaint, report, etc.). Writes models of administrative correspondence correctly in both form and content.	Models of Administrative Correspondence	Theore tical	Formativ e and summati ve

Curriculum Development Plan

- **Updating the course content in line with linguistic and academic developments.**
- **Adding practical applications in writing, expression, and spelling skills.**
- **Including contemporary texts alongside classical/heritage texts to develop linguistic-analysis skills.**

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Weeks One and Two	2.5	2.5
2	Report 2	Weeks Three and Four	2.5	2.5
3	Quiz (1)	Weeks Five and Six	2	2
4	Quiz (2)	Weeks Seven and Eight	2	2
5	Quiz (3)	Weeks Nine and Ten	1	1
6	Term Exam (1)	Weeks Eleven and Twelve	7.5	7.5
7	Term Exam (2)	Weeks 13-14-15	7.5	7.5
8	Coursework total	Coursework total	40	40
9	Final theoretical exam	End-of-semester exams	60	60
	Total	100	100%	100%

12- Teaching and Learning Resources	
1- Required Textbooks	Arabic Language for the Third Intermediate Grade: Fatima Nazim Al-Atabi et al., 1st ed., 2018. 4- General Arabic Language for Non-Specialist Departments: Abdul Qadir Hassan Amin et al., Ministry of Higher Education and Scientific Research, 2nd ed., 2000.
2- Main References (Sources)	Clear Spelling (Al-Imla Al-Wadih): Abdul Majeed Al-Tamimi, Hussam Al-Jeel, Dar Al-Mutanabbi Library, Baghdad, 6th ed., 1987. 2- Lessons in Language, Grammar, and Spelling for State Employees: Ismail Hamoud Atwan et al., Ministry of Education Press No. (3), Baghdad, 2nd ed., 1984.
A- Recommended Books and References (Scientific journals, reports)	In the Spirit of Arabic Literature: Nihal Mohammed Amin, Al-Saadoun Press, Baghdad.
B- Electronic References, Websites	:https://ksaa.gov.sa :https://learning.aljazeera.net/ar

Physical Education Course Description
1- Course Name
Physical Education
2- Course Code
NTU 104
3- Available Attendance Forms
Traditional attendance (in-person) 2. Blended learning
4- Semester / Year
2025-2026, First Level, First Semester
5- Total Teaching Hours / Number of Units
30 hours / 2 units
6- Date of Preparing this Description
8/9/2025
7- Name of Course Coordinator
Name: Asst. Lect. Mustafa Fereydun Faiq Email:Mustafa.f.f.hti@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
Learning the mechanics of human body movement and the common injuries that occur to it. Applying the basic skills of some individual and team sports. Learning the most important sports legislation and rules and how to manage sports tournaments and competitions.
9- Course Outcomes and Teaching, Learning, and Assessment Methods
A- Knowledge Objectives

A1- Identify the concepts of physical fitness, health, sports training, and nutrition. A2- Explain the importance of physical education in disease prevention and promoting a healthy lifestyle.
B- Course-Specific Skill Objectives. B1- List the basic skills in team sports. B2- What are the safety rules during sports activities? C- Affective Objectives C1- The student shows interest in practicing sports activities and maintaining physical fitness. C2- The student appreciates the importance of physical activity in promoting physical and mental health. C3- The student develops a positive attitude toward practicing sports as a healthy lifestyle. C4- The student adheres to sportsmanship and fair play during sports activities and competitions.
- Teaching and Learning Methods
Intensive theoretical lessons, data projector with educational films, practical lessons on fields and in sports halls
- Assessment Methods
Commitment to and regularity of attendance, reports, daily and monthly exams, end-of-semester exam

10- Course Structure Physical Education (Theoretical and Practical Content)

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	2	The student defines the concept of sport and its health and social importance.	Sport: definition, importance, and types	Theoretical + Practical	Written tests and skill tests
2	2	The student explains the basic principles of anatomy and muscular movement.	The Mechanics of Human Body Movement	Theoretical + Practical	Written tests and skill tests
3	2	The student identifies the types of injuries (tears, bruises, fractures, etc.).	Common Sports Injuries	Theoretical + Practical	Written tests and skill tests
4	2	The student learns the names of basic skills (passing, dribbling, shooting,	Basic Skills of Basketball	Theoretical + Practical	Written tests and skill tests
5	2	The student explains the official international rules (number of	International Rules of	Theoretical +	Written tests and skill tests

		players, playing time, fouls, scoring).	Basketball	Practical	
6	2	The student learns the game's skills (serving, receiving, hitting).	Basic Skills of Table Tennis and Its International Rules	Theoretical + Practical	Written tests and skill tests
7	2	The student lists the game's skills (serving, passing, blocking, setting).	Basic Skills of Volleyball and Its International Rules	Theoretical + Practical	Written tests and skill tests
8	2	The student learns the types of swimming (freestyle, breaststroke, backstroke, butterfly).	Swimming	Theoretical + Practical	Written tests and skill tests
9	2	The student identifies the basics of play and the rules (serving, points, faults).	Basic Skills of Tennis and Its International Rules	Theoretical + Practical	Written tests and skill tests
10	2	The student defines the basic rules of play, the number of players, and the field.	Basic Skills of Handball	Theoretical + Practical	Written tests and skill tests
11	2	The student learns the types of track and field events (running, jumping, throwing).	International Rules of Handball	Theoretical + Practical	Written tests and skill tests
12	2	The student identifies the skills (passing, shooting, control, covering).	Track and Field Events (types, international rules)	Theoretical + Practical	Written tests and skill tests
13	2	The student explains the types of competitions (knockout, league, round-robin, etc.).	Basic Skills of Football	Theoretical + Practical	Written tests and skill tests
14	2	The student applies the regulatory procedures in organizing sports events.	Managing Sports Competitions and Tournaments	Theoretical + Practical	Written tests and skill tests
15		The student understands sports laws and legislation.	Sports Laws and Legislation	Theoretical + Practical	Written tests and skill tests
Curriculum Development Plan					

- Improving students' physical fitness and general health.
- Developing basic and specialized motor skills.
- Fostering the spirit of cooperation and teamwork.
- Instilling the values of discipline, commitment, and respect.
- Discovering and developing sports talents.

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	50	50
9	Practical field project	Week Fifteen	5	5
10	Practical assessment	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	10	10
	Total	100	100%	100%

12- Teaching and Learning Resources

1- Required Textbooks	Foundations of Physical Education and Sports Science By: Prof. Dr. Mahmoud Dawood Al-Rubaie
2- Main References (Sources)	Educational Curricula and Physical Education Curricula By: Prof. Dr. Mundhir Hashem Al-Khatib
A- Recommended Books and References (Scientific journals, reports, etc.)	Comprehensive Sports Library Library of Educational Science - International

	Arab Academy
B- Electronic References, Websites	https://openphysed.org/physical-education?utm_source=chatgpt.com

Mathematics Course Description
1. Course Name
Mathematics
2. Course Code
TIHA100
3. Available Attendance Forms
1. Traditional attendance 2. Blended e-learning
4. Semester / Year
2025 – 2026 First Stage / First Semester
5. Total Teaching Hours / Number of Units
45 hours / 3 units
6. Date of Preparing this Description
1/10/2025
7. Name of Course Coordinator
Name: Asst. Lect. Muqdad Daham JasimMuqdad.da@ntu.edu.iq

8. Course Objectives (General Objectives of the Course)
The course aims to help the student understand the mathematical laws and problems needed to solve simple and complex electrical circuits, and to build a mathematical foundation that serves the technical specialization courses.

9. Course Outcomes and Teaching, Learning, and Assessment Methods
The student acquires the ability to work with matrices, complex numbers, and trigonometric functions, and to apply differentiation concepts in solving practical

engineering and physics problems.

- Teaching and Learning Methods

Presentation and theoretical explanation with Q&A and discussion.

- Active learning through effective participation in activities and practical applications.
- Self-learning, cooperative learning, and blended learning.

- Assessment Methods

- Assignments and homework.
- Quiz.
- Practical exam.
- Monthly exam.
- Final written exam.

10- Course Structure Mathematics

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical	Written exam + in-class discussion + assignments	The student reviews the number sets (natural, integer, rational, real). Solves first- and second-degree algebraic equations. Explains the importance of mathematics in solving electrical-circuit problems.	General Introduction: Real Numbers and Algebraic Equations	3	1
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of a matrix and its order. Distinguishes between types of matrices (square, zero, diagonal, identity, symmetric). Writes a matrix from a given system of equations.	Matrices: Definition and Types	3	2
Theoretical	Written exam + in-class discussion + assignments	The student performs addition and subtraction operations between matrices. Applies scalar multiplication and matrix-by-matrix multiplication. Explains the conditions for multiplying two matrices.	Matrix Operations: Addition, Subtraction, and Multiplication	3	3
Theoretical	Written exam + in-class discussion + assignments	The student calculates the determinant of a second- and third-order matrix. Applies the cofactor expansion method. Explains the properties of determinants.	Determinants	3	4
Theoretical	Written exam + in-class discussion + assignments	The student calculates the inverse of a square matrix. Solves a system of linear equations using Cramer's method. Solves a system of linear equations using the matrix inverse.	Matrix Inverse and Solving Systems of Linear Equations	3	5
Theoretical	Written exam + in-class discussion + assignments	The student applies matrices in formulating electrical-circuit equations (Kirchhoff's laws). Solves practical problems on simple electrical circuits using matrices.	Applications of Matrices in Solving Electrical Circuits	3	6
Theoretical	Written exam + in-class	The student defines the complex number and its real and imaginary parts. Represents a complex number	Complex Numbers: Definition and	3	7

	discussion + assignments	graphically on the complex plane (Argand diagram). Performs addition, subtraction, multiplication, and division of complex numbers.	Components		
Theoretical	Written exam + in-class discussion + assignments	The student converts a complex number from algebraic form to polar and exponential form and vice versa. Calculates the modulus and argument of a complex number.	Polar and Exponential Forms of Complex Numbers	3	8
Theoretical	Written exam + in-class discussion + assignments	The student applies De Moivre's theorem to find powers and roots of complex numbers. Uses complex numbers to represent alternating current and voltage in electrical circuits.	De Moivre's Theorem and Its Applications	3	9
Theoretical	Written exam + in-class discussion + assignments	The student defines the basic trigonometric ratios (sine, cosine, tangent) and their relationships. Draws trigonometric curves and determines the period, amplitude, and phase shift.	Trigonometric Functions: Definition and Basic Properties	3	10
Theoretical	Written exam + in-class discussion + assignments	The student proves the basic trigonometric identities. Solves simple trigonometric equations. Applies the angle addition, subtraction, and double-angle rules.	Trigonometric Identities and Solving Trigonometric Equations	3	11
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of the limit of a function at a point. Calculates the limits of algebraic and trigonometric functions. Explains the concept of continuity of a function at a point and over an interval.	Limits and Continuity	3	12
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of the derivative as a rate of change. Differentiates algebraic, exponential, logarithmic, and trigonometric functions using the basic differentiation rules.	Differentiation: Basic Concept and Derivatives of Basic Functions	3	13
Theoretical	Written exam + in-class discussion + assignments	The student applies the product rule and the quotient rule for differentiation. Applies the chain rule to differentiate composite functions. Finds higher-order derivatives.	Advanced Differentiation Rules (Product, Quotient, Chain)	3	14
Theoretical	Written exam + in-class discussion + assignments	The student uses differentiation to find the rate of change of current and voltage in electrical circuits. Solves comprehensive applied problems. Reviews the course's key concepts in preparation for the final exam.	Applications of Differentiation in Solving Electrical-Circuit Problems and General Review	3	15

11- Course Assessment:

Relative Weight %	Grade	Assessment Timing (Week)	Assessment Methods	No.
5	5	Week Four	Scientific Report (1)	1
5	5	Week Eight	Scientific Report (2)	2
5	5	Week Six	Quiz (1)	3
5	5	Week Eleven	Quiz (2)	4

11- Course Assessment:				
Relative Weight %	**Grade**	Assessment Timing (Week)	Assessment Methods	**No.**
15	**15**	Week Seven	Term Exam (1)	**5**
15	**15**	Week Thirteen	Term Exam (2)	**6**
10	**10**	Throughout the semester	Class participation and homework	**7**
40	**40**	End-of-semester exams	Final theoretical exam	**8**
100%	**100**		Total	

12- Teaching and Learning Resources	
Available in the college library	Required Textbooks
▪ **Applied Engineering Mathematics - approved curricular sources** ▪ **• Fundamentals of Differential and Integral Calculus for Technical Institutes - approved curricular sources**	Main References (Sources)
▪ **Calculus**	A- Recommended Books and References: scientific journals, reports

Computer Organization Course Description
1- Course Name
Computer Organization
2- Course Code
CPN 103
3- Available Attendance Forms
Traditional attendance (in-person) 2. Scientific field attendance 3. Blended learning
4- Semester / Year
2025-2026, First Level, Second Semester
5- Total Teaching Hours / Number of Units
45 hours / 5 units
6- Date of Preparing this Description
1/10/2025
7- Name of Course Instructor

Name: Dr. Hassan Abdulsalam

Email:h.a.hamid@ntu.edu.iq

The course aims to introduce the student to the computer's internal components, how they are organized and interact, and to understand the mechanism of instruction execution within the processor and memory.

9- Course Outcomes and Teaching, Learning, and Assessment Methods

The student acquires the ability to analyze the structure of the processor and memory, understand the instruction execution cycle, distinguish between different addressing modes, and deal with the basics of computer performance.

- Presentation and theoretical explanation with Q&A and discussion.
- Active learning through effective participation in activities and practical applications.
- Self-learning, cooperative learning, and blended learning.

Assessment Methods

Practical assessment, theoretical assessment, occupational-safety-skills assessment, observation- and audit-based assessment

10- Course Structure: Computer Organization Theoretical Content

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of the computer and its main components (processor, memory, input/output units). Explains the basic computer operation cycle and the Von Neumann principle in computer organization.	General Introduction to Computer Organization and Its Basic Components	3	1
Theoretical	Written exam + in-class discussion + assignments	The student distinguishes between different number systems. Converts numbers between binary, decimal, octal, and hexadecimal. Explains the importance of the binary system in computer operation.	Number Systems (Binary, Octal, Decimal, Hexadecimal)	3	2
Theoretical	Written exam + in-class discussion + assignments	The student performs addition, subtraction, and multiplication on binary numbers. Represents negative numbers using the 1's and 2's complement methods.	Arithmetic Operations on the Binary System and Representation of Negative Numbers	3	3
Theoretical	Written exam + in-class discussion + assignments	The student explains the BCD, Gray, and ASCII codes and their importance. Converts between these codes and the binary system. Explains how letters and symbols are represented inside the computer.	Digital Codes and Data Representation	3	4
Theoretical	Written exam + in-class discussion + assignments	The student defines the basic logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR). Draws the truth table for each gate	Basic Logic Gates	3	5

		and explains its logic symbol.			
Theoretical	Written exam + in-class discussion + assignments	The student applies the laws and theorems of Boolean algebra. Simplifies logic functions algebraically using postulates and De Morgan's laws.	Boolean Algebra	3	6
Theoretical	Written exam + in-class discussion + assignments	The student uses the Karnaugh map to simplify two-, three-, and four-variable logic functions. Derives the simplified equation from the truth table.	Karnaugh Maps and Logic Function Simplification	3	7
Theoretical	Written exam + in-class discussion + assignments	The student designs the half-adder and full-adder circuits. Explains how to build a multi-bit ripple-carry adder.	Combinational Logic Circuits: Adders	3	8
Theoretical	Written exam + in-class discussion + assignments	The student explains the operation of the encoder and decoder. Explains the operating principle of the multiplexer and demultiplexer and their uses.	Combinational Circuits: Encoders, Decoders, and Multiplexers	3	9
Theoretical	Written exam + in-class discussion + assignments	The student distinguishes between the types of flip-flops (SR, D, JK, T). Draws the state table and excitation table for each type of flip-flop and explains their applications.	Sequential Logic Circuits: Flip-Flops	3	10
Theoretical	Written exam + in-class discussion + assignments	The student explains the structure of shift registers and their types. Distinguishes between synchronous and asynchronous counters.	Registers and Counters	3	11
Theoretical	Written exam + in-class discussion + assignments	The student lists the components of the CPU: the arithmetic logic unit (ALU), the control unit (CU), and the internal registers. Explains the role of each component in executing instructions.	CPU Organization	3	12
Theoretical	Written exam + in-class discussion + assignments	The student explains the stages of the instruction execution cycle (fetch, decode, execute). Distinguishes between different addressing modes (direct, indirect, indexed, immediate).	Instruction Execution Cycle and Addressing Modes	3	13
Theoretical	Written exam + in-class discussion + assignments	The student explains the memory hierarchy (registers, cache memory, main memory RAM/ROM, secondary memory). Compares the types of memory in terms of speed, capacity, and cost.	Memory Organization and Its Hierarchy	3	14
Theoretical	Written exam + in-class discussion + assignments	The student explains the methods of data transfer between the processor and input/output units (polling, interrupts,	Input/Output Units, Buses, and General Review	3	15

		DMA). Explains the role of buses (data bus, address bus, control bus). Reviews the course's key concepts in preparation for the final exam.			

Curriculum Development Plan

Updating the scientific content to keep pace with recent developments in computer organization.

- Strengthening the practical and applied aspects.
- Developing students' skills in using modern technologies.
- Linking the curriculum to labor-market needs.

12- Course Assessment

Relative Weight %	Grade	Assessment Timing (Week)	Assessment Methods	No.
2.5	2.5	Week Four	Report 1	1
2.5	2.5	Week Five	Report 2	2
2	2	Week Six	Quiz (1)	3
2	2	Week Fourteen	Quiz (2)	4
1	1	Week Fifteen	Quiz (3)	5
7.5	7.5	Week Six	Term Exam (1)	6
7.5	7.5	Week Eleven	Term Exam (2)	7
40	40	End-of-semester exams	Final theoretical exam	8
5	5	Week Fifteen	Practical field project	9
2	2	Weeks Three and Five	Practical assessment	10
1	1	Week One	Practical Quiz (1)	11
0.5	0.5	Week Four	Practical Quiz (2)	12
1	1	Week Fourteen	Practical Quiz (3)	13
5.5	5.5	Weeks 6, 8, 9, 10, 11, 12, 13	Direct questions and homework	14
20	20	End-of-semester exams	Final practical exam	15
100%	100%	100	Total	

12- Teaching and Learning Resources

▪ • Computer Organization and Architecture - William Stallings ▪ • Computer Organization and Design - Patterson & Hennessy	Required Textbooks

1- Course Name
Programming with C++
2- Course Name / Code
CPN 100
3- Available Attendance Forms
Traditional attendance (in-person) 2. Scientific field attendance 3. Blended learning

4- Semester / Year
2025-2026, First Level, First Semester
5- Total Teaching Hours
30 hours / 2 units
6- Date of Preparing this Description
1/10/2025
7- Name of Course Instructor
Name: Dr. Hassan Abdulsalam Email: h.a.hamid@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
The course aims to introduce the student to the basics of structured and object-oriented programming in C++, and to equip him/her with the skill of designing and writing simple to moderately complex programs and solving problems programmatically.
9- Course Outcomes and Teaching, Learning, and Assessment Methods
The student acquires the ability to write programs using variables, conditional statements, loops, functions, arrays, and pointers, along with an introduction to object-oriented programming concepts.
- Teaching and Learning Methods
Intensive theoretical lessons, data projector with educational films, practical application every lecture
Assessment Methods
Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam

10- Course Structure: Programming with C++ (Theoretical Content)					
Teaching Method	**Assessment Method**	**Required Learning Outcomes**	**Unit / Topic Name**	**Hours**	**Week**
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of programming and the stages of program development. Explains the history of C++ and its features. Learns the development environment (IDE) and how to write, compile, and run the first program (Hello World).	General Introduction to Programming, C++, and the Programming Environment	3	1
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between basic data types (int, float, double, char, bool). Defines variables and constants. Applies arithmetic operators (+, -, *, /, %) and their precedence.	Variables, Data Types, and Arithmetic Operators	3	2
Theoretical + Practical	Written exam + practical application + assignments	The student uses cin and cout for data input and output. Applies the if, if-else, and if-else if statements for decision-making within the program.	Input/Output Statements (cin, cout) and if/else Conditional Statements	3	3
Theoretical + Practical	Written exam + practical application + assignments	The student uses the switch-case statement for multi-path control. Applies comparison operators (==, !=, <, >) and logical operators (&&, ||, !).	The switch Statement, Logical Operations, and Comparison Operations	3	4
Theoretical + Practical	Written exam + practical application + assignments	The student builds a for loop to perform definite iteration. Uses nested loops to solve practical problems.	for Loops	3	5
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between while and do-while loops in terms of the loop condition. Uses the break and continue statements to control loop flow.	while and do-while Loops	3	6
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of an array and how to declare and initialize it. Applies read, write, search, and sort operations on one-dimensional arrays.	One-Dimensional Arrays	3	7
Theoretical + Practical	Written exam + practical application + assignments	The student defines two-dimensional arrays and how to work with them. Applies matrix addition and multiplication operations using nested loops.	Two-Dimensional Arrays	3	8
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of a function and its benefits in modular programming. Builds functions with return values and void functions. Distinguishes between pass-by-value and pass-by-reference.	Functions: Definition, Calling, and Parameter Passing	3	9
Theoretical + Practical	Written exam + practical application + assignments	The student applies function overloading. Uses default arguments. Explains the principle of recursion.	Advanced Functions: Overloading, Default Arguments, and Recursive Functions	3	10
Theoretical + Practical	Written exam + practical application + assignments	The student works with the string data type and its built-in functions (length, substr, find, concatenation). Applies comparison and processing operations on text.	Strings and Their Processing	3	11

Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of a pointer and its relationship to variables and arrays. Uses the address-of (&) and dereference (*) operators. Applies dynamic memory allocation using new and delete.	Pointers and Dynamic Memory	3	12
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of a class and an object. Builds a class containing data members and member functions.	Introduction to Object-Oriented Programming: Classes and Objects	3	13
Theoretical + Practical	Written exam + practical application + assignments	The student builds constructors of various types and the destructor. Applies the encapsulation principle using access specifiers (public, private, protected).	Constructors, Destructors, and Encapsulation	3	14
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of inheritance between classes and its types. Explains the principle of polymorphism and virtual functions. Reviews the course's key concepts in preparation for the final exam.	Inheritance, Polymorphism, and General Review	3	15

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	50	50
9	Practical project	Week Fifteen	5	5
10	Practical assessment	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	10	10
	Total	100	100%	100%

12- Teaching and Learning Resources

1- Required Textbooks	

2- Main References (Sources)	• C++ How to Program - Deitel & Deitel • Computer Programming in C++ - approved curricular sources

Electronic Principles Course Description

The course aims to introduce the student to electronic components made from semiconductors of various types, structures, and properties, and their uses in electronic circuits, along with analyzing their electronic circuits.

1- Course Name
Electronic Principles
2- Course Code
CPN 104
3- Available Attendance Forms
Traditional attendance (in-person) 2. Scientific field attendance 3. Blended learning
4- Semester / Year
2025-2026, First Level, Second Semester
5- Total Teaching Hours / Number of Units
45 hours / 5 units
6- Date of Preparing this Description
1/10/2025
7- Name of Course Coordinator
Name: Lect. Husniya Jasim Abdullah Email:husniyah_hwj@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
The course aims to introduce the student to electronic components made from semiconductors of various types, structures, and properties, and their uses in electronic circuits, along with analyzing their electronic circuits.
9- Course Outcomes and Teaching, Learning, and Assessment Methods
The student acquires an understanding of optoelectronics and its components, along with the skill of analyzing rectifier, filter, and clipper circuits, simplified integrated circuits, and amplifier applications.
Teaching and Learning Methods
Intensive theoretical lessons, data projector, solving mathematical problems, homework, planning field experiments
- Assessment Methods
Commitment to and regularity of attendance, class participation, homework, daily and monthly exams, end-of-semester exam

10- Course Structure	**Electronics**	**(Theoretical and Practical Content)**

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between conducting, insulating, and semiconducting materials. Explains the atomic structure of semiconductors (silicon and germanium) and their importance in the manufacture of electronic components.	General Introduction to Electronics: Conducting Materials and Semiconductors	3	1
Theoretical + Practical	Written exam + practical application + assignments	The student explains the doping process and the formation of N-type and P-type semiconductors. Explains the structure of the PN junction, the depletion region, and the barrier potential.	Semiconductor Theory: N-Type, P-Type, and the PN Junction	3	2
Theoretical + Practical	Written exam + practical application + assignments	The student defines the diode's symbol and structure. Explains the diode's operation under forward and reverse bias. Draws the I-V characteristic curve of the diode.	The Diode: Structure, Properties, and Characteristic Curve	3	3
Theoretical + Practical	Written exam + practical application + assignments	The student designs a half-wave rectifier circuit. Designs both types of full-wave rectifier circuits (center-tapped and bridge rectifier). Calculates the rectified voltage values.	Diode Applications: Rectifier Circuits (Half-Wave and Full-Wave)	3	4
Theoretical + Practical	Written exam + practical application + assignments	The student explains the role of the capacitor filter in smoothing the rectified wave. Explains the properties of the Zener diode and its use in voltage regulation.	Filters, the Zener Diode, and Voltage Regulation Circuits	3	5
Theoretical + Practical	Written exam + practical application + assignments	The student defines the structure of the bipolar junction transistor and its terminals (base, emitter, collector). Distinguishes between the two transistor types (NPN, PNP) and their symbols.	The Bipolar Junction Transistor (BJT): Structure and Types	3	6
Theoretical + Practical	Written exam + practical application + assignments	The student explains the mechanism of the transistor's operation as a switch and an amplifier. Distinguishes between the transistor's three operating regions: cutoff, active, and saturation.	Transistor Operation and Operating Regions	3	7
Theoretical + Practical	Written exam + practical application + assignments	The student designs various transistor biasing circuits (fixed base bias, feedback bias, voltage-divider bias). Calculates the operating point (Q-point).	Transistor Biasing Circuits	3	8
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of signal amplification using the transistor. Calculates the amplification factors (current gain β and voltage gain) in a simple amplifier circuit.	The Transistor as an Amplifier: Amplification Concept and Gain	3	9
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between the three amplifier configurations in terms of voltage and current gain and input/output resistance. Identifies the applications of each configuration.	Basic Amplifier Circuits (Common Emitter, Common Base, Common Collector)	3	10
Theoretical + Practical	Written exam + practical application + assignments	The student defines the structure of the field-effect transistor (JFET) and the MOSFET. Distinguishes between them and the bipolar junction	The Field-Effect Transistor (FET) and MOSFET	3	11

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
		transistor in terms of operating principle and applications.			
Theoretical + Practical	Written exam + practical application + assignments	The student defines the op-amp symbol and its inputs (inverting and non-inverting). Explains the ideal characteristics of the op-amp (input resistance, output resistance, voltage gain).	Operational Amplifiers (Op-Amp): Structure and Ideal Characteristics	3	12
Theoretical + Practical	Written exam + practical application + assignments	The student designs the inverting and non-inverting amplifier circuits using the op-amp. Calculates the voltage gain for each circuit. Builds a summing amplifier circuit.	Op-Amp Applications (Inverting, Non-Inverting, Summing)	3	13
Theoretical + Practical	Written exam + practical application + assignments	The student explains the operating principle of oscillator circuits and the conditions for oscillation. Explains the operation of linear voltage regulators (IC regulators such as the 78xx series).	Oscillators and Voltage Regulators	3	14
Theoretical + Practical	Written exam + practical application + assignments	The student explains the difference between analog and digital circuits. Learns about the most famous digital integrated-circuit families (TTL, CMOS). Reviews the course's key concepts in preparation for the final exam.	Introduction to Digital Integrated Circuits and General Review	3	15

Curriculum Development Plan

Continuously updating the curriculum to keep pace with labor-market developments through the curriculum-update committee and the scientific committee.

• Holding scientific seminars and conferences aimed at updating curricula.

• Keeping up with ongoing scientific and technical developments in the field of specialization.

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	40	40
9	Practical field project	Week Fifteen	5	5
10	Practical assessment	Weeks Three and	2	2

			Five		
	11	Practical Quiz (1)	Week One	1	1
	12	Practical Quiz (2)	Week Four	0.5	0.5
	13	Practical Quiz (3)	Week Fourteen	1	1
	14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
	15	Final practical exam	End-of-semester exams	20	20
		Total	100	100%	100%

12- Teaching and Learning Resources	
Classrooms and laboratory	• Electronic Devices and Circuit Theory - Boylestad & Nashelsky • Electronic Principles - approved curricular sources

Basics of Computer Networks Course Description
1- Course Name
Basics of Computer Networks
2- Course Code
CPN 105
3- Available Attendance Forms
Traditional attendance (in-person) 2. Scientific field attendance 3. Blended learning
4- Semester / Year
2025-2026, First Level, First Semester
5- Total Teaching Hours
45 hours / 5 units
6- Date of Preparing this Description
1/10/2025
7- Name of Course Instructor
Name: Asst. Prof. Dr. Suhail Najm Shihab Email:drsuhel_hwj@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
The course aims to introduce the student to the basic concepts of computer networks, their types and topologies, understand the reference models (OSI and TCP/IP), and equip him/her with the ability to work with IP addressing and design a simple local network, serving subsequent technical specialization courses.
9- Course Outcomes and Teaching, Learning, and Assessment Methods
The student acquires the ability to identify network types and topologies, understand the functions of the OSI and TCP/IP model layers, work with IPv4 addressing and subnetting, and understand the basics of

network security and simple local-network design.

- Teaching and Learning Methods

Intensive theoretical lessons, data projector with educational films, practical application every lecture

- Assessment Methods

Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam

10- Course Structure

Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method	
1	3	The student defines the concept of a computer network and its benefits. Reviews a historical overview of network development and the origin of the Internet. Explains the basic components of any network (sender, receiver, transmission medium).	General Introduction to Computer Networks: Definition, Importance, and Historical Development	Theoretical + Practical	Written exam + practical application + assignments	
2	3	The student distinguishes between the local area network (LAN), metropolitan area network (MAN), wide area network (WAN), and personal area network (PAN). Explains the characteristics and uses of each type.	Types of Networks by Geographic Scope (LAN, MAN, WAN, PAN)	Theoretical + Practical	Written exam + practical application + assignments	
3	3	The student explains the star, ring, bus, mesh, and hybrid topologies. Compares them in terms of cost, reliability, and ease of expansion.	Network Topologies	Theoretical + Practical	Written exam + practical application + assignments	
4	3	The student lists the seven layers of the OSI model. Explains the function of each layer and its role in the communication process between devices.	The OSI Reference Model: The Seven Layers and Their Functions	Theoretical + Practical	Written exam + practical application + assignments	
5	3	The student lists the four layers of the TCP/IP model. Compares the OSI and TCP/IP models in terms of the number of layers and their functions.	The TCP/IP Model and Its Comparison with the OSI Model	Theoretical + Practical	Written exam + practical application + assignments	
6	3	The student distinguishes between types of wired cables (twisted pair, coaxial cable, fiber optic). Compares them in terms of transmission speed, range, and cost.	Wired Communication Media	Theoretical + Practical	Written exam + practical application + assignments	
7	3	The student explains the principle of wireless communication, radio waves, and infrared. Lists the most important wireless-network standards (Wi-Fi, Bluetooth).	Wireless Communication Media and Transmission Technologies	Theoretical + Practical	Written exam + practical application + assignments	
8	3	The student distinguishes between the functions of different network devices. Explains the difference between a switch and a router in terms of operating layer and function.	Network Devices (Hub, Switch, Router, Bridge, Repeater, Gateway)	Theoretical + Practical	Written exam + practical application + assignments	
9	3	The student explains the function of the data-link layer. Explains the structure of a MAC address and its role in identifying devices on the local network. Defines the Ethernet protocol	The Data-Link Layer, the Ethernet Protocol, and MAC Addressing	Theoretical + Practical	Written exam + practical application + assignments	

		and its data frame.			
Theoretical + Practical	Written exam + practical application + assignments	The student explains the function of the network layer and the role of the IP protocol. Explains the structure of an IPv4 address and its classes (Class A, B, C). Distinguishes between private and public addresses.	The Network Layer: The IP Protocol and IPv4 Addressing	3	10
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of the subnet mask. Calculates the number of subnetworks and hosts resulting from the subnetting of a given IP address.	Subnetting and the Subnet Mask	3	11
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between the connection-oriented TCP protocol and the connectionless UDP protocol. Explains the connection-establishment mechanism in TCP (the three-way handshake) and the concept of port numbers.	The Transport Layer: TCP and UDP Protocols	3	12
Theoretical + Practical	Written exam + practical application + assignments	The student explains the function of the HTTP protocol for web browsing, FTP for file transfer, DNS for domain-name resolution, and DHCP for automatic IP-address distribution.	The Application Layer: HTTP, FTP, DNS, DHCP Protocols	3	13
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of the firewall and its role in protecting the network. Lists the most important common security threats (viruses, denial-of-service attacks, phishing) and the basic methods of protection against them.	Basic Network Security: Firewalls and Common Threats	3	14
Theoretical + Practical	Written exam + practical application + assignments	The student designs a diagram for a simple local network connecting a number of devices using a switch and a router. Reviews the course's key concepts in preparation for the final exam.	Simple Local Network Design and General Review	3	15

Curriculum Development Plan

• Continuously updating the curriculum to keep pace with labor-market developments through the curriculum-update committee and the scientific committee.

• Holding scientific seminars and conferences aimed at updating curricula.

• Keeping up with ongoing scientific and technical developments in the field of specialization.

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5

7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	50	50
9	Practical field project	Week Fifteen	5	5
10	Practical assessment	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	10	10
	Total	100	100%	100%

12- Teaching and Learning Resources	
1- Required Textbooks	Computer Networks - Concepts and Applications - Dr. Sami Burhan • Introduction to Computer Networks and the Internet - a group of academics • Computer Network Fundamentals - CCNA Cisco - Mohamed Abdel-Aati

Python Programming Course Description

1. Course Name
Python Programming
2. Course Code
CPN 101
3. Available Attendance Forms
In-person
4. Semester / Year
First Level, First Semester / 2025 - 2026
5. Total Teaching Hours / Number of Units
45 hours / 5 units
6. Date of Preparing this Description
1/10/2025
7. Name of Course Coordinator
Dr. Hassan Abdulsalam

Email h.a.hamid@ntu.edu.iq

8. Course Objectives

The course aims to introduce the student to the Python language and its programming environment, and to equip him/her with the skill of designing and writing programs using control structures, functions, and object-oriented programming, in preparation for using it in network applications and data analysis.

Course Outcomes (Strategies)

A- Knowledge Objectives

The student acquires the ability to write Python programs that work with lists, dictionaries, files, and exceptions, in addition to the basics of object-oriented programming and common Python libraries.

Teaching and Learning Methods

Presentation and theoretical explanation with Q&A and discussion.

- Active learning through effective participation in activities and practical applications.
- Self-learning, cooperative learning, and blended learning.

10- Course Structure

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of programming and the stages of program development. Explains the features of Python and its fields of use. Learns the development environment and how to write and run the first program (Hello World).	General Introduction to Programming, Python, and the Programming Environment	3	1
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between basic data types (int, float, str, bool). Defines variables in Python. Applies arithmetic operators (+, -, *, /, //, %, **) and their precedence.	Variables, Basic Data Types, and Arithmetic Operators	3	2
Theoretical + Practical	Written exam + practical application + assignments	The student uses the input() and print() functions for data input and output. Applies the if, elif, and else statements for decision-making within the program.	Input/Output Statements (input, print) and Conditional Statements	3	3
Theoretical + Practical	Written exam + practical application + assignments	The student builds a for loop to iterate over lists, strings, and the range() function. Uses nested loops to solve practical problems.	for Loops and the range() Function	3	4
Theoretical + Practical	Written exam + practical application + assignments	The student builds a while loop for conditional iteration. Uses the break and continue statements to control loop flow.	while Loops and break/continue Statements	3	5
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of a list and how to create it and access its elements. Applies add, remove, sort, and slicing operations on lists.	Lists and Their Basic Operations	3	6
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between lists and tuples in terms of mutability. Explains the properties of sets and their operations (union,	Tuples and Sets	3	7

		intersection, difference).			
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of a dictionary and the key-value structure. Applies add, remove, search, and iteration operations on dictionaries.	Dictionaries and Their Operations	3	8
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of a function and its benefits in organizing the program. Builds functions using def with parameters and return values. Explains local and global variable scope.	Functions: Definition, Calling, and Parameter Passing	3	9
Theoretical + Practical	Written exam + practical application + assignments	The student applies default parameter values. Uses *args and **kwargs to pass a variable number of arguments. Builds short lambda functions and uses them with map and filter.	Advanced Functions: Default Values, *args, **kwargs, and Lambda Functions	3	10
Theoretical + Practical	Written exam + practical application + assignments	The student works with built-in string functions (split, join, replace, find). Applies text-formatting methods using f-strings and format().	Strings: Processing and Formatting	3	11
Theoretical + Practical	Written exam + practical application + assignments	The student opens text files using open() and the different opening modes. Applies read, write, and append operations on files using the with statement.	File Handling: Reading and Writing	3	12
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of an exception and its common types. Applies the try/except/finally structure to handle errors during program execution.	Exception Handling	3	13
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of a class and an object in Python. Builds a class containing attributes and methods using __init__ and the self parameter.	Introduction to Object-Oriented Programming: Classes and Objects	3	14
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of inheritance between classes in Python. Imports and uses some common built-in libraries (math, random, datetime). Reviews the course's key concepts in preparation for the final exam.	Inheritance, Introduction to Modules, and General Review	3	15

Course Development Plan

- [Legacy template text carried over from an unrelated course - see note]
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- [Legacy template text carried over from an unrelated course - see note]

11- Course Assessment

Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
Daily oral exams	Theoretical: 2 - 15	Theoretical 3	5%

	Practical: 2 - 15	Practical 2	
Daily written exams	Theoretical: 2 - 15 Practical: 2 – 15	Theoretical 5 Practical 5	10%
Two term exams during the semester, for both practical and theoretical parts	Theoretical: 2 - 15 Practical: 2 - 15	Theoretical 10 Practical 5	15%
Assigning students to prepare reports on course topics	Theoretical: 7 - 13 Practical: 6 - 14	Theoretical 7 Practical 3	10%
Final exam	Theoretical: 15 Practical: 15	Theoretical 40 Practical 20	40% 20%
Total		100	100%
12- Teaching and Learning Resources			
1- Required Textbooks	• Learning Python Programming from Scratch to Mastery - Eng. Abdullah Al-Sharif • Python Crash Course - Eric Matthes		

Computer Architecture Course Description
1- Course Name
Computer Architecture
2- Course Code
CPN 102
3- Available Attendance Forms
Traditional attendance (in-person) 2. Scientific field attendance 3. Blended learning
4- Semester / Year
2025-2026, First Level, First Semester
5- Total Teaching Hours / Number of Units
45 hours / 5 units
6- Date of Preparing this Description
1/10/2025
7- Name of Course Coordinator
Name: Lect. Hassan Abdulsalam Email:h.a.hamid@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
The course aims to introduce the student to the general principles of computer architecture, its various styles, and methods of improving

performance through parallelism and hierarchical storage.

9- Course Outcomes and Teaching, Learning, and Assessment Methods

Presentation and theoretical explanation with Q&A and discussion.

• Active learning through effective participation in activities and practical applications.

• Self-learning, cooperative learning, and blended learning.

10- Course Structure Computer Architecture (Theoretical Content)

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of computer architecture and distinguishes it from the concept of organization. Reviews the historical development of computer generations and its impact on modern architecture.	Introduction to Computer Architecture: Basic Concepts and the Difference Between Architecture and Organization	3	1
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of performance and its relation to execution time. Calculates the clock rate, cycles per instruction (CPI), and the total execution time of a given program.	Computer Performance Metrics	3	2
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of the instruction set and its role as an interface between software and hardware. Distinguishes between types of instructions (data transfer, arithmetic, program-flow control).	Instruction Set Architecture (ISA)	3	3
Theoretical	Written exam + in-class discussion + assignments	The student explains the different addressing modes (direct, immediate, indexed, indirect). Compares the RISC and CISC design philosophies in terms of the number of instructions and their complexity.	Addressing Modes and Processor Classification (RISC vs CISC)	3	4
Theoretical	Written exam + in-class discussion + assignments	The student explains the components of the single-cycle datapath. Traces the execution path of a single instruction through the processor's various components.	Single-Cycle Processor Datapath Design	3	5
Theoretical	Written exam + in-class discussion + assignments	The student distinguishes between hardwired control units and microprogrammed control units. Explains the control signals needed to execute instructions.	The Control Unit: Hardwired and Microprogrammed Design	3	6
Theoretical	Written exam + in-class discussion + assignments	The student explains the operating principle of pipelining in processors. Lists the basic pipeline stages (fetch, decode, execute, memory access, write-back). Calculates the	Pipelining: Concept and Stages	3	7

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
		theoretical speedup resulting from using a pipeline.			
Theoretical	Written exam + in-class discussion + assignments	The student classifies the types of pipeline hazards (structural, data, control). Explains methods for handling these hazards, such as forwarding and stalling.	Pipeline Hazards and How to Handle Them	3	8
Theoretical	Written exam + in-class discussion + assignments	The student explains the memory hierarchy in terms of speed, capacity, and cost. Explains the principle of temporal and spatial locality of reference and its impact on memory design.	The Memory Hierarchy and the Principle of Locality	3	9
Theoretical	Written exam + in-class discussion + assignments	The student lists the cache-mapping methods (direct mapping, fully associative mapping, set-associative mapping). Calculates hit and miss rates.	Cache Memory: Design and Mapping	3	10
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of virtual memory and its benefits. Explains the paging mechanism, the page table, and the role of the translation lookaside buffer (TLB).	Virtual Memory and Address Translation	3	11
Theoretical	Written exam + in-class discussion + assignments	The student distinguishes between data-transfer methods (programmed I/O, interrupts, direct memory access - DMA). Explains the advantages and disadvantages of each method.	I/O Systems and Data-Transfer Methods	3	12
Theoretical	Written exam + in-class discussion + assignments	The student lists Flynn's taxonomy of computer systems (SISD, SIMD, MISD, MIMD). Explains the operating principle of multi-core processors and their importance.	Parallel Processing and Flynn's Taxonomy	3	13
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of superscalar processing. Explains the principle of out-of-order execution and its effect on improving performance.	Advanced Architectures: Superscalar Processing and Out-of-Order Execution	3	14
Theoretical	Written exam + in-class discussion + assignments	The student reviews the most important recent trends in computer architecture (GPUs, cloud computing, AI processors). Reviews the course's key concepts in preparation for the final exam.	Recent Trends in Computer Architecture and General Review	3	15

Curriculum Development Plan

Continuously updating the curriculum to keep pace with labor-market developments through the curriculum-update committee and the scientific committee.

• Holding scientific seminars and conferences aimed at updating curricula.

• Keeping up with ongoing scientific and technical developments in the field of specialization.

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5

2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	50	50
9	Practical field project	Week Fifteen	5	5
10	Practical assessment	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	10	10
	Total	100	100%	100%

12- Teaching and Learning Resources	
Classrooms, laboratories, and workshops	Available
Required Textbooks	• Computer Architecture: A Quantitative Approach - Hennessy & Patterson

Principles of Electrical Engineering Course Description
1- Course Name
Principles of Electrical Engineering
2- Course Code
CPN 106
3- Available Attendance Forms
Traditional attendance (in-person) 2. Scientific field attendance 3. Blended learning
4- Semester / Year
2025-2026, First Level, First Semester
5- Total Teaching Hours / Units
45 hours / 5 units

6- Date of Preparing this Description

8/9/2025

7- Name of Course Instructor

Name: Lect. Husniya Jasim Abdullah

Email:h.a.hamid@ntu.edu.iq

8- Course Objectives (General Objectives of the Course)

The course aims to introduce the student to the basic principles of electrical circuits and their laws, and to analyze DC and AC circuits, in preparation for understanding the power systems used in network equipment.

9- Course Outcomes and Teaching, Learning, and Assessment Methods

The student acquires the ability to analyze simple electrical circuits using Ohm's law and Kirchhoff's laws, and to understand the basics of alternating current, transformers, and electrical safety.

- Teaching and Learning Methods

Intensive theoretical lessons, data projector with educational films, practical application with every lecture

- Assessment Methods

Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam

10- Course Structure Principles of Electrical Engineering

Theoretical Content

Continuously updating the curriculum to keep pace with labor-market developments through the curriculum-update committee and the scientific committee.

• Holding scientific seminars and conferences aimed at updating curricula.

• Keeping up with ongoing scientific and technical developments in the field of specialization.

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of computer architecture and distinguishes it from the concept of organization. Reviews the historical development of computer generations and its impact on modern architecture.	Introduction to Computer Architecture: Basic Concepts and the Difference Between Architecture and Organization	3	1
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of performance and its relation to execution time. Calculates the clock rate, cycles per instruction (CPI), and the total execution time of a given program.	Computer Performance Metrics	3	2
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of the instruction set and its role as an interface between software and hardware. Distinguishes between types of instructions (data transfer, arithmetic, program-flow control).	Instruction Set Architecture (ISA)	3	3

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical	Written exam + in-class discussion + assignments	The student explains the different addressing modes (direct, immediate, indexed, indirect). Compares the RISC and CISC design philosophies in terms of the number of instructions and their complexity.	Addressing Modes and Processor Classification (RISC vs CISC)	3	4
Theoretical	Written exam + in-class discussion + assignments	The student explains the components of the single-cycle datapath. Traces the execution path of a single instruction through the processor's various components.	Single-Cycle Processor Datapath Design	3	5
Theoretical	Written exam + in-class discussion + assignments	The student distinguishes between hardwired control units and microprogrammed control units. Explains the control signals needed to execute instructions.	The Control Unit: Hardwired and Microprogrammed Design	3	6
Theoretical	Written exam + in-class discussion + assignments	The student explains the operating principle of pipelining in processors. Lists the basic pipeline stages (fetch, decode, execute, memory access, write-back). Calculates the theoretical speedup resulting from using a pipeline.	Pipelining: Concept and Stages	3	7
Theoretical	Written exam + in-class discussion + assignments	The student classifies the types of pipeline hazards (structural, data, control). Explains methods for handling these hazards, such as forwarding and stalling.	Pipeline Hazards and How to Handle Them	3	8
Theoretical	Written exam + in-class discussion + assignments	The student explains the memory hierarchy in terms of speed, capacity, and cost. Explains the principle of temporal and spatial locality of reference and its impact on memory design.	The Memory Hierarchy and the Principle of Locality	3	9
Theoretical	Written exam + in-class discussion + assignments	The student lists the cache-mapping methods (direct mapping, fully associative mapping, set-associative mapping). Calculates hit and miss rates.	Cache Memory: Design and Mapping	3	10
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of virtual memory and its benefits. Explains the paging mechanism, the page table, and the role of the translation lookaside buffer (TLB).	Virtual Memory and Address Translation	3	11
Theoretical	Written exam + in-class discussion + assignments	The student distinguishes between data-transfer methods (programmed I/O, interrupts, direct memory access - DMA). Explains the advantages and disadvantages of each method.	I/O Systems and Data-Transfer Methods	3	12
Theoretical	Written exam + in-class discussion + assignments	The student lists Flynn's taxonomy of computer systems (SISD, SIMD, MISD, MIMD). Explains the operating principle of multi-core processors and their importance.	Parallel Processing and Flynn's Taxonomy	3	13
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of superscalar processing. Explains the principle of out-of-order execution and its effect on improving performance.	Advanced Architectures: Superscalar Processing and Out-of-Order Execution	3	14

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical	Written exam + in-class discussion + assignments	The student reviews the most important recent trends in computer architecture (GPUs, cloud computing, AI processors). Reviews the course's key concepts in preparation for the final exam.	Recent Trends in Computer Architecture and General Review	3	15

11- Course Assessment				
No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	50	50
9	Practical field project	Week Fifteen	5	5
10	Practical assessment	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	10	10
	Total	100	100%	100%
12- Teaching and Learning Resources				
Classrooms, laboratory, and field		**Available**		
1- Required Textbooks		• Fundamentals of Electrical Engineering - approved curricular sources • Fundamentals of Electric Circuits - Sadiku		

Internet of Things Course Description
1- Course Name
Internet of Things
2- Course Code
CPN 107
3- Available Attendance Forms
In-person
4- Semester / Year

2025-2026, First Level, Second Semester

5- Total Teaching Hours

75 hours / 5 units

6- Date of Preparing this Description

1/10/2025

7- Name of Course Coordinator:

Name: Asst. Prof. Dr. Suhail Najm Shihab
Email: drsuhel_hwj@ntu.edu.iq

8- Course Objectives (General Objectives of the Course)

The course aims to introduce the student to the concept of the Internet of Things (IoT), its architecture and technologies, and to enable him/her to work with microcontrollers, sensors, and the communication protocols used in its applications.

9- Course Outcomes and Teaching, Learning, and Assessment Methods

The student acquires the ability to design a simple IoT application using a microcontroller and sensors, and to understand transport protocols and data security in this field.

- Teaching and Learning Methods

Intensive theoretical lessons, data projector with educational films, practical application with every lecture

- Assessment Methods

Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam

10- Course Structure

Curriculum Development Plan

Continuously updating the curriculum to keep pace with labor-market developments through the curriculum-update committee and the scientific committee.

• Holding scientific seminars and conferences aimed at updating curricula.

• Keeping up with ongoing scientific and technical developments in the field of specialization.

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of the Internet of Things (IoT) and its basic idea. Reviews the historical development of the concept and its various fields of application in daily life and industry.	General Introduction to the Internet of Things: Definition, Concept, and Development	3	1
Theoretical + Practical	Written exam + practical application + assignments	The student explains the basic layers of IoT systems (perception layer, network layer, application layer). Explains the role of each layer and its components.	IoT System Architecture	3	2
Theoretical + Practical	Written exam + practical application + assignments	The student lists common sensor types (temperature, humidity, motion, light, gas). Explains the operating principle of each sensor and its fields of use.	Sensors: Types and Applications	3	3
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of an actuator and its role in converting electrical signals into motion or action. Lists common actuator types (motors, valves, relays).	Actuators and Their Role in IoT Systems	3	4

Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between a microcontroller and a single-board computer. Learns about common development boards (Arduino, Raspberry Pi, ESP32), their specifications, and fields of use.	Microcontrollers and Development Boards (Arduino, Raspberry Pi, ESP32)	3	5
Theoretical + Practical	Written exam + practical application + assignments	The student writes a simple program to control a sensor and read its value. Programs a development board to control an actuator based on a given sensor value.	Basic Microcontroller Programming for Controlling Sensors and Actuators	3	6
Theoretical + Practical	Written exam + practical application + assignments	The student explains the operating principle of short-range communication protocols (Bluetooth, Zigbee, RFID, NFC). Compares them in terms of range, power consumption, and fields of use.	Short-Range Communication Protocols (Bluetooth, Zigbee, RFID, NFC)	3	7
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between long-range communication technologies (Wi-Fi, LoRaWAN, Cellular/NB-IoT). Explains the criteria for choosing the appropriate technology according to the application's requirements.	Long-Range Wireless Communication Protocols (Wi-Fi, LoRaWAN, NB-IoT)	3	8
Theoretical + Practical	Written exam + practical application + assignments	The student explains the operating principle of the MQTT protocol based on publish/subscribe. Compares it with the CoAP and HTTP protocols in terms of use in IoT applications.	IoT Application-Layer Protocols (MQTT, CoAP, HTTP)	3	9
Theoretical + Practical	Written exam + practical application + assignments	The student explains the role of cloud computing in IoT systems. Learns about the most popular IoT cloud platforms and their basic functions.	Cloud Computing and IoT Cloud Platforms	3	10
Theoretical + Practical	Written exam + practical application + assignments	The student explains the nature of the big data generated by IoT devices. Explains the methods of storing and processing this data and the role of edge computing.	Storing and Processing Big Data Generated by the IoT	3	11
Theoretical + Practical	Written exam + practical application + assignments	The student lists the most important security threats facing IoT systems. Explains basic protection methods (encryption, authentication, software updates).	IoT Security: Threats and Protection Methods	3	12
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of the smart city and smart home and their applications. Lists practical examples of IoT systems used in these two fields.	IoT Applications: Smart Cities and Smart Homes	3	13
Theoretical + Practical	Written exam + practical application + assignments	The student explains IoT applications in smart agriculture and remote healthcare. Explains the concept of the Industrial Internet of Things (IIoT) and its role in modern industry.	IoT Applications: Smart Agriculture, Healthcare, and Industry	3	14
Theoretical + Practical	Written exam + practical application + assignments	The student designs a diagram for a simple IoT project connecting a sensor and an actuator via a development board and displaying data remotely. Reviews the course's key concepts in preparation for the final exam.	Simple IoT Project Design and General Review	3	15

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	40	40
9	Practical field project	Week Fifteen	5	5
10	Programming assessment	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	20	20
	Total	100	100%	100%

13- Teaching and Learning Resources	
Classrooms and laboratory	Available
1- Required Textbooks	• Internet of Things: A Hands-On Approach - Bahga & Madisetti

Engineering Drawing Course Description

1. Course Name
Engineering Drawing
2. Course Code
TIHA 105
3. Available Attendance Forms
In-person
4. Semester / Year
First Level, Second Semester / 2025 - 2026
5. Total Teaching Hours / Number of Units
45 hours / 3 units

6. Date of Preparing this Description
1/10/2025
7. Name of Course Coordinator
Name: Asst. Lect. Sara Burhan Ezzat Email sarah-hwj@ntu.edu.iq
8. Course Objectives
The course aims to introduce the student to the basics of engineering drawing, its tools and standard specifications, and to equip him/her with the skill of representing three-dimensional objects via orthographic projection and various views, and correctly dimensioning them, along with an introduction to computer-aided design (CAD), serving subsequent technical specialization courses.
9. Course Outcomes (Strategies)
The student acquires the ability to use engineering-drawing tools and perform basic geometric constructions, draw the three orthographic views, sections, and isometric drawings, and dimension them according to standard specifications, in addition to a practical introduction to using computer-aided drawing software.
Teaching and Learning Methods
- Delivering lectures. - Using dialogue and discussion with students to convey theoretical information. - Applying theoretical lessons and using modern laboratories. - Using computers and display devices during lectures.
Assessment Methods
Written exams (daily, monthly, and end-of-semester) to measure knowledge attainment. –
10. Course Structure
Course Development Plan
- [Legacy template text carried over from an unrelated course - see note] - [Legacy template text carried over from an unrelated course - see note] - [Legacy template text carried over from an unrelated course - see note] - [Legacy template text carried over from an unrelated course - see note]

11. Course Assessment

Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
Daily oral exams	Theoretical: 2 - 15 Practical: 2 - 15	Theoretical 3 Practical 2	5%
Daily written exams	Theoretical: 2 - 15 Practical: 2 - 15	Theoretical 5 Practical 5	10%
Two term exams during the semester, for both practical and	Theoretical: 2 - 15 Practical: 2 - 15	Theoretical 10 Practical 5	15%

theoretical parts			
Assigning students to prepare reports on course topics	Theoretical: 7 - 13 Practical: 6 - 14	Theoretical 7 Practical 3	10%
Final exam	Theoretical: 15 Practical: 15	Theoretical 40 Practical 20	40% 20%
		100	100%

12. Teaching and Learning Resources

1- Required Textbooks	Fundamentals of Engineering Drawing - approved curricular sources • Engineering Drawing - N.D. Bhatt . ●

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical + Practical	Written exam + practical application + drawing assignments	The student explains the importance of engineering drawing as a communication language between engineers and technicians. Learns the manual engineering-drawing tools (ruler, protractor, compass, drawing board) and how to use them.	General Introduction to Engineering Drawing: Importance and Tools Used	3	1
Theoretical + Practical	Written exam + practical application + drawing assignments	The student distinguishes between standard engineering line types (continuous, dashed, center line) and their uses. Explains the concept of drawing scale and applies it to enlarging and reducing shapes.	Types of Engineering Lines and Drawing Scales	3	2
Theoretical + Practical	Written exam + practical application + drawing assignments	The student writes engineering lettering and numerals according to standard specifications. Designs the title block for the engineering drawing sheet.	Engineering Lettering, Numerals, and Titles	3	3
Theoretical + Practical	Written exam + practical application + drawing assignments	The student performs basic geometric constructions (bisecting a line and an angle, drawing perpendicular and parallel lines, dividing a line into equal parts) using manual drawing tools.	Basic Geometric Constructions	3	4
Theoretical + Practical	Written exam + practical application + drawing assignments	The student draws regular polygons (triangle, square, hexagon) using geometric construction. Draws circles tangent to lines and other circles.	Drawing Regular Polygons and Tangent Circles	3	5
Theoretical + Practical	Written exam + practical application + drawing assignments	The student explains the concept of orthographic projection and its importance in representing three-dimensional objects on a two-dimensional plane. Distinguishes between the basic projection planes.	Orthographic Projection: Basic Concepts	3	6
Theoretical + Practical	Written exam + practical application + drawing assignments	The student distinguishes between first-angle and third-angle projection methods. Explains the symbols of each method and the regions of the world where each is used.	Projection Methods: First-Angle and Third-Angle	3	7

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical + Practical	Written exam + practical application + drawing assignments	The student draws the front, top, and side views of a simple engineering object. Applies the rules of alignment between the three views.	Drawing the Three Views of Simple Objects	3	8
Theoretical + Practical	Written exam + practical application + drawing assignments	The student explains the purpose of using sections in engineering drawing. Distinguishes between types of sections (full, half, local) and how to hatch them.	Sectional Views and Their Types	3	9
Theoretical + Practical	Written exam + practical application + drawing assignments	The student explains the principle of isometric drawing and its three axes. Draws simple engineering objects using isometric projection.	Isometric Drawing	3	10
Theoretical + Practical	Written exam + practical application + drawing assignments	The student applies standard dimensioning rules (dimension lines, extension lines, arrows, numerals). Distinguishes between chain, parallel, and datum dimensioning systems.	Dimensioning: Rules and Fundamentals	3	11
Theoretical + Practical	Written exam + practical application + drawing assignments	The student explains the need for auxiliary views when inclined surfaces are present. Draws an auxiliary view of an object containing an inclined surface to show its true size.	Auxiliary Views and Drawing Complex Sections	3	12
Theoretical + Practical	Written exam + practical application + drawing assignments	The student learns the standard engineering symbols for various materials (metal, wood, glass). Explains surface-finish symbols.	Engineering Symbols, Material Symbols, and Finishes	3	13
Theoretical + Practical	Written exam + practical application + drawing assignments	The student learns the concept of computer-aided design (CAD) and its advantages compared to manual drawing. Executes a simple engineering drawing using a basic CAD program.	Introduction to Computer-Aided Design (CAD)	3	14
Theoretical + Practical	Written exam + practical application + drawing assignments	The student produces a complete engineering-drawing sheet including the three views and dimensions of a given engineering object. Reviews the course's key concepts in preparation for the final exam.	Comprehensive Engineering-Drawing Project and General Review	3	15

Network Management Course Description

1. Course Name
Network Management
2. Course Code
CPN 202
3. Available Attendance Forms
In-person
4. Semester / Year
First Level, Second Semester / 2025 - 2026
5. Total Teaching Hours / Number of Units

75 hours / 5 units

6. Date of Preparing this Description

1/10/2025

7. Name of Course Coordinator

Name: Asst. Prof. Raed Waadallah

8. Course Objectives

The course aims to introduce the student to network-management concepts, tools, and protocols, and to enable him/her to monitor network performance and troubleshoot faults.

٩. Course Outcomes (Strategies)

The student acquires the ability to use network management and monitoring tools, apply dynamic routing protocols, and set up basic monitoring systems for a small network.

Teaching and Learning Methods

- Presentation and theoretical explanation with Q&A and discussion.

• Active learning through effective participation in activities and practical applications.

• Self-learning, cooperative learning, and blended learning.

Assignments and homework.

• Quiz.

• Practical exam.

• Monthly exam.

• Final written exam.

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10. Course Structure

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of network management and its importance in the workplace. Lists the basic tasks of a network administrator (monitoring, maintenance, security, user management).	Introduction to Network Management: Concepts and Basic Tasks of a Network Administrator	3	1
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between common network operating systems (Windows Server, Linux). Explains the basic differences between them in terms of use, cost, and support.	Network Operating Systems	3	2
Theoretical + Practical	Written exam + practical application + assignments	The student installs a server operating system at a basic level. Performs the initial server settings (hostname, static IP address, basic roles).	Configuring and Managing Network Servers: Installation and Basic Setup	3	3
Theoretical + Practical	Written exam + practical application + assignments	The student installs the DHCP service on the server. Configures a scope to automatically distribute IP addresses to network devices and defines its basic options.	Managing the DHCP Service and Automatic IP-Address Distribution	3	4
Theoretical + Practical	Written exam + practical application + assignments	The student installs the DNS service on the server. Creates a zone and adds basic DNS records to resolve domain names to IP addresses.	Managing the DNS Service and Domain-Name Resolution	3	5
Theoretical + Practical	Written exam + practical application + assignments	The student installs Active Directory. Creates user accounts and groups and organizes them within organizational units.	Managing Users and Groups (Active Directory)	3	6
Theoretical + Practical	Written exam + practical application + assignments	The student configures shared folders on the network. Applies NTFS and share permissions to users and groups.	Managing Permissions on Shared Resources	3	7
Theoretical + Practical	Written exam + practical application + assignments	The student configures the basic settings of a switch and a router via the command-line interface (CLI). Explains common initial configuration commands.	Managing Active Devices: Switches and Routers	3	8
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of a virtual local area network (VLAN) and its benefits. Creates and configures multiple VLANs on a switch and links them via routing.	Virtual LANs (VLANs) and Network Segmentation	3	9
Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between static routing and dynamic routing. Configures basic routing paths between two subnetworks.	Basic Routing Protocols	3	10
Theoretical + Practical	Written exam + practical application + assignments	The student uses basic network-monitoring tools (ping, tracert, Wireshark). Explains the basic indicators of network performance (response time, bandwidth, packet loss).	Network Monitoring and Its Tools	3	11
Theoretical + Practical	Written exam + practical application + assignments	The student follows a structured methodology for troubleshooting common network problems. Diagnoses and resolves basic connectivity issues between devices on the network.	Network Troubleshooting	3	12

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical + Practical	Written exam + practical application + assignments	The student configures basic rules on a firewall to control data traffic. Explains the concept of intrusion detection and prevention systems (IDS/IPS).	Network Security Management: Firewalls and Intrusion Detection Systems	3	13
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of network virtualization and software-defined networks (SDN). Explains the role of cloud computing in managing modern network resources.	Introduction to Network Virtualization and Cloud Computing	3	14
Theoretical + Practical	Written exam + practical application + assignments	The student implements a comprehensive project to set up a local network including a server, DHCP and DNS services, users, and permissions. Reviews the course's key concepts in preparation for the final exam.	Setting Up and Managing a Comprehensive Local Network, and General Review	3	15

Website Design Course Description

1- Course Name

Website Design

2- Course Code

CPN 203

3- Available Attendance Forms

Traditional attendance 2. Scientific field attendance 3. Blended learning

4- Semester / Year

2025-2026, First Level, First Semester

5- Total Teaching Hours

75 hours / 5 units

6- Date of Preparing this Description

1/10/2025

7- Name of Course Coordinator:

Name: Asst. Prof. Raed Waadallah Dawood

Email:raid_hwj@ntu.edu.iq

8- Course Objectives (General Objectives of the Course)

The course aims to introduce the student to the basics of website design, building pages with HTML and CSS, and designing responsive user interfaces.

9- Course Outcomes and Teaching, Learning, and Assessment Methods

The student acquires the ability to design comprehensive, responsive web pages, apply user-experience principles, and publish a simple website on web hosting.

- Teaching and Learning Methods

Intensive theoretical lessons, data projector with educational films, practical application with every lecture

- Assessment Methods

Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of a website and its basic components. Explains the difference between front-end web design and back-end server programming. Learns the code editors and tools used.	General Introduction to Website Design and Design Principles	3	1
Theoretical + Practical	Written exam + practical application + assignments	The student writes a simple HTML page using basic tags (headings, paragraphs, links, images). Explains the general structure of an HTML document.	HTML Basics: Tags and Basic Elements	3	2
Theoretical + Practical	Written exam + practical application + assignments	The student uses HTML5 semantic elements (header, nav, main, section, footer) to structure the page in an organized way that is understandable to search engines.	Structuring a Web Page Using HTML5 and Semantic Elements	3	3
Theoretical + Practical	Written exam + practical application + assignments	The student links a CSS file to an HTML page. Applies different CSS selectors (type, class, ID). Modifies color, font, and spacing properties.	CSS Basics: Selectors, Properties, and Colors	3	4
Theoretical + Practical	Written exam + practical application + assignments	The student explains the CSS box model (border, padding, margin). Controls the display properties of page elements.	Page Styling with CSS: The Box Model	3	5
Theoretical + Practical	Written exam + practical application + assignments	The student builds flexible layouts using Flexbox. Controls the alignment and distribution of elements within the container using various Flexbox properties.	Designing Menus and Layouts Using Flexbox	3	6
Theoretical + Practical	Written exam + practical application + assignments	The student builds grid layouts using CSS Grid. Defines the rows, columns, and gaps between grid items.	Grid Design Using CSS Grid	3	7
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of responsive design and its importance for various screen sizes. Applies media queries to adapt the page design to device size.	Responsive Design and Media Queries	3	8
Theoretical + Practical	Written exam + practical application + assignments	The student designs a data-entry form using the form tag and its elements (input, select, textarea, button). Explains the basic validation properties built into HTML5.	HTML Forms and Input Handling	3	9
Theoretical + Practical	Written exam + practical application + assignments	The student writes basic JavaScript code including variables, data types, arithmetic operations, and conditional statements.	Introduction to JavaScript: Variables, Operations, and Conditional Statements	3	10
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of the Document Object Model (DOM). Uses JavaScript to access HTML elements and dynamically modify their content and properties.	Working with the DOM and Interacting with Page Elements	3	11
Theoretical + Practical	Written exam + practical application + assignments	The student attaches events (click, submit, change) to page elements using JavaScript. Applies form-data validation before submission.	JavaScript Events and Form Validation	3	12

Theoretical + Practical	Written exam + practical application + assignments	The student explains the difference between user experience (UX) and user interface (UI). Applies basic design principles (contrast, consistency, ease of navigation) in his/her designs.	User Experience (UX) and User Interface (UI) Principles	3	13
Theoretical + Practical	Written exam + practical application + assignments	The student explains the steps for publishing a website on web hosting and connecting it to a domain name. Lists the basics of search-engine optimization (meta tags, keywords, load speed).	Publishing a Website Online and Basics of Search Engine Optimization (SEO)	3	14
Theoretical + Practical	Written exam + practical application + assignments	The student designs a comprehensive, multi-page website using HTML, CSS, and JavaScript. Reviews the course's key concepts in preparation for the final exam.	Comprehensive Website Design Project and General Review	3	15

12- Teaching and Learning Resources

1- Required Textbooks	• HTML and CSS: Design and Build Websites - Jon Duckett • Don't Make Me Think - Steve Krug

Daily oral exams	Theoretical: 2 - 15 Practical: 2 - 15	Theoretical 3 Practical 2	5%
Daily written exams	Theoretical: 2 - 15 Practical: 2 - 15	Theoretical 5 Practical 5	10%
Two term exams during the semester, for both practical and theoretical parts	Theoretical: 2 - 15 Practical: 2 - 15	Theoretical 10 Practical 5	15%
Assigning students to prepare reports on course topics	Theoretical: 7 - 13 Practical: 6 - 14	Theoretical 7 Practical 3	10%
Final exam	Theoretical: 15 Practical: 15	Theoretical 40 Practical 20	40% 20%
Total		100	100%

Operating Systems Course Description

1- Course Name

Operating Systems

2- Course Code

CPN 206

3- Available Attendance Forms

Traditional attendance (in-person) 2. Scientific field attendance 3. Blended learning

4- Semester / Year

2025-2026, First Level, Second Semester

5- Total Teaching Hours

75 hours / 5 units

6- Date of Preparing this Description

1/10/2025

7- Name of Course Instructor

Name: Lect. Raed Abdul Karim
Email:raedkarim@ntu.edu.iq

8- Course Objectives (General Objectives of the Course)

The course aims to introduce the student to operating-system concepts and their basic functions in managing processes, memory, files, and devices.

9- Course Outcomes and Teaching, Learning, and Assessment Methods

The student acquires the ability to analyze CPU-scheduling algorithms, manage memory and files, and work with basic Linux commands.

• Presentation and theoretical explanation with Q&A and discussion.

• Active learning through effective participation in activities and practical applications.

• Self-learning, cooperative learning, and blended learning.

Assessment Methods

Assignments and homework.

• Quiz.

• Practical exam.

• Monthly exam.

• Final written exam.

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of an operating system and its role as an intermediary between the user and the hardware. Lists the basic functions of an operating system (processor, memory, file, and I/O management).	General Introduction to Operating Systems: Definition and Basic Functions	3	1

Theoretical	Written exam + in-class discussion + assignments	The student distinguishes between types of operating systems (batch, time-sharing, real-time, distributed, multiprocessor). Explains the characteristics and uses of each type.	Types of Operating Systems	3	2
Theoretical	Written exam + in-class discussion + assignments	The student defines the concept of a process and distinguishes it from a program. Explains the different process states (new, ready, running, waiting, terminated) and the transitions between them.	The Process Concept and Its Different States	3	3
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of CPU scheduling and its goals. Applies the First-Come-First-Served (FCFS) and Shortest-Job-First (SJF) algorithms and calculates performance metrics (waiting time, turnaround time).	CPU Scheduling: Basic Algorithms (FCFS, SJF)	3	4
Theoretical	Written exam + in-class discussion + assignments	The student applies the Round Robin algorithm and priority-scheduling algorithm. Compares the different scheduling algorithms in terms of efficiency and fairness.	Advanced CPU Scheduling (Round Robin, Priority Scheduling)	3	5
Theoretical	Written exam + in-class discussion + assignments	The student distinguishes between a process and a thread. Explains the benefits of using multiple threads and the types of threading models (user-level, kernel-level).	Threads and Concurrency	3	6
Theoretical	Written exam + in-class discussion + assignments	The student explains the critical-section problem resulting from process concurrency. Lists the conditions that must be met in any solution to the critical-section problem.	Concurrency and the Critical-Section Problem	3	7
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of a semaphore and its uses in concurrency. Applies semaphores to solve classical concurrency problems such as the producer-consumer problem.	Semaphores and Solving Classical Concurrency Problems	3	8
Theoretical	Written exam + in-class discussion + assignments	The student lists the four necessary conditions for deadlock to occur. Explains the methods of dealing with deadlock (prevention, avoidance, detection and recovery).	Deadlock: Causes and Methods of Detection and Handling	3	9
Theoretical	Written exam + in-class discussion + assignments	The student explains basic memory-management methods (fixed and variable partitioning). Applies memory-allocation algorithms (first fit, best fit, worst fit).	Memory Management: Fixed and Variable Partitioning	3	10
Theoretical	Written exam + in-class discussion + assignments	The student explains the principle of paging and the page table. Explains the concept of segmentation and compares it with paging.	Paging and Segmentation	3	11
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of virtual memory and its benefits. Applies page-replacement algorithms (FIFO, LRU, Optimal) and calculates the page-fault rate.	Virtual Memory and Page Replacement	3	12
Theoretical	Written exam + in-class discussion + assignments	The student explains the concept of a file, the file system, and its functions. Lists directory-organization methods and disk-space-allocation methods for files.	File Management and File Systems	3	13

Theoretical	Written exam + in-class discussion + assignments	The student explains the components of the I/O management system. Applies basic disk-scheduling algorithms (FCFS, SSTF, SCAN) to improve read/write performance.	I/O Device Management and Disk Scheduling	3	14
Theoretical	Written exam + in-class discussion + assignments	The student explains the basics of operating-system security (authentication, access control, virus protection). Reviews the course's key concepts in preparation for the final exam.	Operating System Security and General Review	3	15

Curriculum Development Plan

• Continuously updating the curriculum to keep pace with labor-market developments through the curriculum-update committee and the scientific committee.

• Holding scientific seminars and conferences aimed at updating curricula.

• Keeping up with ongoing scientific and technical developments in the field of specialization.

11- Course Assessment

Relative Weight %	Grade	Assessment Timing (Week)	Assessment Methods	No.
2.5	2.5	Week Four	Report 1	1
2.5	2.5	Week Five	Report 2	2
2	2	Week Six	Quiz (1)	3
2	2	Week Fourteen	Quiz (2)	4
1	1	Week Fifteen	Quiz (3)	5
7.5	7.5	Week Six	Term Exam (1)	6
7.5	7.5	Week Eleven	Term Exam (2)	7
50	50	End-of-semester exams	Final theoretical exam	8
5	5	Week Fifteen	Practical field project	9
2	2	Weeks Three and Five	Practical assessment	10
1	1	Week One	Practical Quiz (1)	11
0.5	0.5	Week Four	Practical Quiz (2)	12
1	1	Week Fourteen	Practical Quiz (3)	13
5.5	5.5	Weeks 6, 8, 9, 10, 11, 12, 13	Direct questions and homework	14
10	10	End-of-semester exams	Final practical exam	15
100%	100%	100	Total	

13- Teaching and Learning Resources

Available	Classrooms and

	laboratories
• Operating System Concepts - Silberschatz, Galvin & Gagne • Modern Operating Systems - Andrew S. Tanenbaum	Required Textbooks

Website Programming Course Description
1- Course Name
Website Programming
2- Course Code
CPN 204
3- Available Attendance Forms:
Traditional attendance (in-person), scientific field attendance, blended learning
4- Semester / Year:
2025-2026, Second Level, First Semester
5- Total Teaching Hours:
75 hours
6- Date of Preparing this Description
1/10/2025
7- Name of Course Coordinator
Name: Asst. Prof. Dr. Suhail Najm Shihab Email:drsuhel_hwj@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
The course aims to enable the student to build dynamic web pages using JavaScript and server-side programming languages, and to work with databases within web applications.
9- Course Outcomes and Teaching, Learning, and Assessment Methods
The student acquires the ability to program interactive web pages, work with forms and databases from the server side, and build a comprehensive dynamic website.
- Teaching and Learning Methods
Intensive theoretical lessons, data projector with educational films, practical application with every lecture
- Assessment Methods
Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam
Course Structure

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week

Theoretical + Practical	Written exam + practical application + assignments	The student distinguishes between static and dynamic websites. Explains the role of server-side programming languages in building interactive websites. Learns the PHP runtime environment and its setup.	Introduction to Dynamic Website Programming	3	1
Theoretical + Practical	Written exam + practical application + assignments	The student writes simple PHP code embedded within an HTML page. Defines variables and distinguishes between basic PHP data types.	PHP Basics: General Syntax, Variables, and Data Types	3	2
Theoretical + Practical	Written exam + practical application + assignments	The student applies the if, else, and switch conditional statements in PHP. Uses for, while, and foreach loops to process data.	Conditional Statements and Loops in PHP	3	3
Theoretical + Practical	Written exam + practical application + assignments	The student defines indexed and associative arrays in PHP. Applies common array-processing functions (sorting, searching, merging).	Arrays in PHP and Their Processing	3	4
Theoretical + Practical	Written exam + practical application + assignments	The student builds custom functions in PHP using the function keyword. Passes parameters by value and by reference and uses return values.	Functions in PHP and Parameter Passing	3	5
Theoretical + Practical	Written exam + practical application + assignments	The student designs an HTML form and processes its data via PHP. Distinguishes between the GET and POST data-submission methods and when to use each.	Form Processing and Receiving Data via GET and POST	3	6
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of a session and a cookie and the difference between them. Creates, reads, and deletes a session and a cookie using PHP.	Sessions and Cookies	3	7
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of a relational database and tables. Writes basic SQL queries (SELECT, INSERT) using a MySQL database-management tool.	Introduction to Databases and MySQL	3	8
Theoretical + Practical	Written exam + practical application + assignments	The student connects a PHP page to a MySQL database using MySQLi or PDO. Executes insert and select queries and displays the data on the web page.	Connecting to the Database from PHP and Executing Queries	3	9
Theoretical + Practical	Written exam + practical application + assignments	The student executes the update and delete operations on database data. Builds a comprehensive CRUD data-management system for a single table.	Updating and Deleting Data, and Building a Comprehensive CRUD System	3	10
Theoretical + Practical	Written exam + practical application + assignments	The student designs a login and new-account registration system using PHP and MySQL. Applies a basic password-hashing mechanism and validates user data.	Login System and User Authentication	3	11
Theoretical + Practical	Written exam + practical application + assignments	The student designs a form for uploading files to the server using PHP. Validates the type and size of the uploaded file before saving it.	File Upload and Handling	3	12

Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of SQL injection attacks and prevention methods (prepared statements). Explains the concept of XSS attacks and how to protect against them.	Dynamic Website Security: SQL Injection and Cross-Site Scripting	3	13
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of frameworks and their benefit in speeding up website development. Builds a simple class in PHP using object-oriented programming principles.	Introduction to Frameworks and Object-Oriented Programming in PHP	3	14
Theoretical + Practical	Written exam + practical application + assignments	The student implements a comprehensive dynamic-website project including an input form, a database connection, and a login system. Reviews the course's key concepts in preparation for the final exam.	Comprehensive Dynamic Website Project and General Review	3	15

Course Development Plan

• Continuously updating the curriculum to keep pace with labor-market developments through the curriculum-update committee and the scientific committee.

• Holding scientific seminars and conferences aimed at updating curricula.

- • Keeping up with ongoing scientific and technical developments in the field of specialization.

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	50	50
	Practical field project	Week Fifteen	5	5
10	Practical assessment	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	10	10
	Total	100	100%	100%

12- Teaching and Learning Resources

Classrooms, laboratory, and field	Available
1- Required Textbooks	• PHP and MySQL Web Development - Luke Welling & Laura Thomson • JavaScript: The Definitive Guide - David Flanagan

Encryption and Computer Security Course Description
1- Course Name
Encryption and Computer Security
2- Course Code
CPN 201
3- Available Attendance Forms:
Traditional attendance (in-person), scientific field attendance, blended learning
4- Semester / Year:
2025-2026, Second Level, First Semester
5- Total Teaching Hours / Number of Credit Units
60 hours / 5 units
6- Date of Preparing this Description
1/10/2025
7- Name of Course Coordinator
Name: Asst. Prof. Raed Abdul Karim Email: Drjasim_hwj@ntu.edu.iq
8- Course Objectives (General Objectives of the Course)
The course aims to introduce the student to the basic concepts of encryption and its classical and modern systems, and to equip him/her with the ability to analyze symmetric and asymmetric encryption algorithms such as AES and RSA, and understand hash functions, digital signatures, and public-key infrastructure, serving subsequent information-security and technical specialization courses.
- Course Outcomes and Teaching, Learning, and Assessment Methods
The student acquires the ability to analyze classical and modern encryption systems, distinguish between symmetric and asymmetric encryption, and understand the AES and RSA algorithms and hash functions, in addition to understanding the principle of digital signatures, digital certificates, and secure communication protocols.
- Teaching and Learning Methods
Intensive theoretical lessons, data projector with educational films, practical laboratory application with every lecture
- Assessment Methods
Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-semester exam

12- Teaching and Learning Resources	
1- Required Textbooks	[Legacy template text carried over from an unrelated course - see note]
	[Legacy template text carried over from an unrelated course - see note]
2- Main References (Sources)	
A- Recommended Books and References (Scientific journals, reports, etc.)	[Legacy template text carried over from an unrelated course - see note]
	[Legacy template text carried over from an unrelated course - see note]
	[Legacy template text carried over from an unrelated course - see note]
	[Legacy template text carried over from an unrelated course - see note]
B- Electronic References, Websites	https://agriculture.uodiyala.edu.iq/wp-content/uploads/2023/09/%D9%83%D9%84-%D9%85%D89-1.pdf

No.	Assessment Methods	Assessment Timing (Week)	Grade	Relative Weight %
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	50	50
9	Practical field project	Week Fifteen	5	5
10	[Legacy template text carried over from an unrelated course - see note]	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	10	10
	Total	100	100%	100%

Visual Basic Programming Course Description

1- Course Name

Programming with Visual Basic

2- Course Code

CPN 205

3- Available Attendance Forms:

Traditional attendance (in-person), scientific field attendance, blended learning

4- Semester / Year:

2025-2026, Second Level, Second Semester

5- Total Teaching Hours:

75 hours / 5 units

6- Date of Preparing this Description

1/10/2025

7- Name of Course Coordinator

Name: Ahsan Abdulsalam

Email:h.a.hamid@ntu.edu.iq

8- Course Objectives (General Objectives of the Course)

The student acquires the ability to design interactive graphical user interfaces using Visual Basic, write code including variables, conditional statements, loops, and functions, handle errors and files, and build applications connected to databases.

9- Course Outcomes and Teaching, Learning, and Assessment Methods

The course aims to introduce the student to the basics of visual programming using Visual Basic, and to equip him/her with the skill of designing graphical user interfaces and working with various controls, writing code to control program logic, handling errors and files, and connecting to databases, serving subsequent technical specialization courses.

Teaching and Learning Methods

- Presentation and theoretical explanation with Q&A and discussion.
- Active learning through practical applications on the computer in the lab.
- Self-learning, cooperative learning, and blended learning.

Assessment Methods

- Programming assignments and homework.
- Quiz.
- Practical exam (designing and programming an application).
- Monthly exam.
- Final written exam

- Teaching and Learning Methods

Intensive theoretical lessons, data projector with educational films, practical laboratory application with every lecture

- Assessment Methods

Commitment to and regularity of attendance, reports, homework, daily and monthly exams, end-of-

semester exam

Teaching Method	Assessment Method	Required Learning Outcomes	Unit / Topic Name	Hours	Week
Theoretical + Practical	Written exam + practical application + assignments	The student defines the concept of visual programming and distinguishes it from traditional text-based programming. Learns the Visual Basic development environment and its basic components.	General Introduction to Visual Programming and the Visual Basic Environment	3	1
Theoretical + Practical	Written exam + practical application + assignments	The student creates a new form and controls its basic properties (name, size, color, title). Distinguishes between the design window and the code window.	Learning the Form Design Interface and Controlling Properties	3	2
Theoretical + Practical	Written exam + practical application + assignments	The student adds basic controls to the form and modifies their properties. Writes simple code in a button click event.	Basic Controls (Label, TextBox, Button) and Their Events	3	3
Theoretical + Practical	Written exam + practical application + assignments	The student defines variables using Dim and specifies their type. Applies basic arithmetic and logical operators in Visual Basic.	Variables, Data Types, and Arithmetic Operators in VB	3	4
Theoretical + Practical	Written exam + practical application + assignments	The student applies the If...Then...Else statement for decision-making. Uses the Select Case statement for multi-path control.	If and Select Case Conditional Statements	3	5
Theoretical + Practical	Written exam + practical application + assignments	The student builds a For...Next loop for definite iteration. Uses While and Do...Loop for conditional iteration.	For, While, and Do Loop Iteration	3	6
Theoretical + Practical	Written exam + practical application + assignments	The student defines one- and two-dimensional arrays in Visual Basic. Applies read, write, and iteration operations on array elements.	Arrays in Visual Basic	3	7
Theoretical + Practical	Written exam + practical application + assignments	The student builds a sub procedure and a function in Visual Basic. Passes parameters and uses return values to organize the code.	Sub Procedures and Functions	3	8
Theoretical + Practical	Written exam + practical application + assignments	The student uses advanced controls (ComboBox, ListBox, CheckBox, RadioButton) in designing interactive interfaces. Programs their basic events.	Advanced Controls (ComboBox, ListBox, CheckBox, RadioButton)	3	9
Theoretical + Practical	Written exam + practical application + assignments	The student designs main and sub-menus for the application. Explains the concept of the multiple-document interface (MDI) and how to create an application containing several child windows.	Menus, Toolbars, and Multiple Windows (MDI)	3	10
Theoretical + Practical	Written exam + practical application + assignments	The student explains the concept of exceptions in Visual Basic. Applies the Try...Catch...Finally structure to handle potential errors during program execution.	Error Handling Using Try/Catch	3	11
Theoretical + Practical	Written exam + practical application + assignments	The student opens text files and reads from and writes to them using the StreamReader and StreamWriter objects.	Working with Text Files (File Handling)	3	12

Theoretical + Practical	Written exam + practical application + assignments	The student connects a Visual Basic project to a database using ADO.NET. Executes basic queries (SELECT, INSERT) through code.	Basic Database Connectivity (ADO.NET)	3	13
Theoretical + Practical	Written exam + practical application + assignments	The student displays database data in the DataGridView control. Binds other controls (TextBox, ComboBox) to the database data.	Displaying Database Data in Controls (DataGridView)	3	14
Theoretical + Practical	Written exam + practical application + assignments	The student designs a comprehensive application using Visual Basic that includes a user interface and a database connection. Reviews the course's key concepts in preparation for the final exam.	Comprehensive Application Project Design and General Review	3	15

Curriculum Development Plan

- [Legacy template text carried over from an unrelated course - see note]
- [Legacy template text carried over from an unrelated course - see note]
- [Legacy template text carried over from an unrelated course - see note]

11- Course Assessment

No.	Assessment Methods	Assessment Timing (Week)	Grade	**Relative Weight %**
1	Report 1	Week Four	2.5	2.5
2	Report 2	Week Five	2.5	2.5
3	Quiz (1)	Week Six	2	2
4	Quiz (2)	Week Fourteen	2	2
5	Quiz (3)	Week Fifteen	1	1
6	Term Exam (1)	Week Six	7.5	7.5
7	Term Exam (2)	Week Eleven	7.5	7.5
8	Final theoretical exam	End-of-semester exams	50	50
9	Practical field project	Week Fifteen	5	5
10	Practical assessment	Weeks Three and Five	2	2
11	Practical Quiz (1)	Week One	1	1
12	Practical Quiz (2)	Week Four	0.5	0.5
13	Practical Quiz (3)	Week Fourteen	1	1
14	Direct questions and homework	Weeks 6, 8, 9, 10, 11, 12, 13	5.5	5.5
15	Final practical exam	End-of-semester exams	10	10
	Total	100	100%	100%

12- Teaching and Learning Resources

Required Textbooks	Programming with Visual Basic (Floyd)