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

Academic Program and Course Description Guide

2026

Academic Program Description Form

University Name: Northern Technical University

Faculty/Institute: **Polytechnic College - Mosul**

Scientific Department: Prosthetics and Orthotics Technologies

Academic or Professional Program Name: Diploma in Prosthetics and Orthotics Technologies

Final Certificate Name: Diploma in Prosthetics and Orthotics Technologies

Academic System: Decisions

Description Preparation Date: 1/9/2025

File Completion Date: 1/9/2025

Signature:

Head of Department Name: Dr. Ayman Sabah Rashed

Date 1/9/2025

Signature:

Scientific Associate Name: Dr. Hassan M. Qassim

Date:

The file is checked by: Ehssan .M . Ali

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 2/9/2025

Sig 2/9/2025

A.N

Approval of the Dean

1. Program Vision

To attain a leading position in the education, advancement, and dissemination of knowledge in prosthetics and orthotics technologies at both the local and regional levels, while contributing to the enhancement of individuals' quality of life through research-informed, innovative, and sustainable solutions.

2. Program Mission

To educate and train highly competent professionals in prosthetics and orthotics by integrating advanced theoretical frameworks with evidence-based clinical and technical practice, thereby addressing evolving healthcare needs, promoting functional independence, and supporting the social inclusion of individuals, in accordance with international standards and the ethical foundations of the profession.

3. Program Objectives

1. **Provide academically rigorous education:** Deliver comprehensive, high-quality curricula that combine theoretical depth with applied laboratory and clinical training to graduate practitioners equipped with advanced competencies.
2. **Foster scientific inquiry and innovation:** Strengthen research capacity in prosthetics and orthotics technologies by encouraging scholarly investigation, innovation, and the development of sustainable, evidence-based solutions.
3. **Enhance community engagement:** Expand the department's contributions to society by offering specialized technical services and expert consultation to healthcare institutions and community partners.
4. **Integrate emerging technologies:** Embed cutting-edge technologies—such as additive manufacturing, digital design, and artificial intelligence—within academic programs and practical training environments.
5. **Strengthen academic and professional partnerships:** Develop and sustain collaborative relationships with national and international academic institutions, research centers, and industry partners to support experiential learning and applied research.
6. **Cultivate professional and ethical values:** Uphold and promote the principles of professional ethics, social responsibility, and integrity as core components of student formation and professional identity.

4. Program Accreditation

The program has been applied for accreditation.

5. Other external influences

1- Scientific Developments

2- Scientific and Field Visits

3- Summer Training

4- Training Courses

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
University Requirements	9-11	18	21.9%	8 Essential 2 optional
Institute Requirements	8	19	19.5%	3 Essential
Department Requirements	24	81	58.5%	25 Essential 1 optional
Summer Training	completed	-------	-------	
Other	/	There isn't any		

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
2024-2025 / First	NTU100	Human rights and democracy	2	
	NTU101	English language	2	
	NTU102	computer	1	1
	NTU103	Arabic language	2	
	NTU104	Sports (optional)	1	1
	MTI100	Mathematics	2	

	MTI101	Mechanical Workshops		3
	MTI102	Engineering Drawing		3
	MTI103	Calculus	2	
	ETMI100	DC Current Circuits	2	2
	ETMI101	AC Current Circuit	2	2
	ETMI102	Analogue Electronic Principles	2	2
	ETMP101	Analogue Electronic	2	2
	ETMI104	Electronic workshop		3
	ETMI105	Electrical workshop		2
	ETMI108	Physics	2	2
	ETMI109	Medical Physics	2	2
	ETMP102	Principals of Medical Rehabilitation Methods	2	2
	ETMP103	Medical Rehabilitation Methods	2	2
	ETMI112	Mechanics	2	0
2024-2025 / Second	NTU200	English language	2	
	NTU201	computer	1	1
	NTU202	Arabic language	2	
	NTU203	Baath Party crimes in Iraq	2	
	NTU204	Professional ethics	2	
	MTI200	Research Project	2	
	MTI201	Specialized Workshop	3	
	MTI202	Application Project		2
	MTI203	professional Safety	2	
	ETMI200	Electrical Measurements and Sensors	2	2
	ETMI201	Basic Electronic Circuits	2	3
	ETMI202	Principles of Microcomputer	2	2
	ETMP201	Fabrication of Orthoses and Supports	2	2
	ETMP202	Maintenance of Orthotic and Prosthetic Devices		3
	ETMP203	Fabrication of Prosthetic Limbs	2	2
	ETMI207	Advanced Electronic Circuits	2	3
	ETMI209	Physiology	2	
	ETMI210	Maintenance of Electromechanical Medical Instrumentations		3
	ETMP204	Microprocessors	2	2
	ETMI213	PLC	1	2
	ETMI214	Renewable Energy Systems(selective)	1	2
	ETMI215	Computer Applications(selective)	1	2

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Explaining the scientific foundations of the anatomy and physiology of the human body related to prosthetics and orthotics. Identifying the materials used in the fabrication of prosthetic and orthotic devices, along with their properties and various applications.

	Understanding the fundamental principles of electronics. Comprehending the principles of occupational safety and the quality standards adopted in industrial and rehabilitation centers.
Skills	
Learning Outcomes 2	1. Designing and manufacturing upper- and lower-limb prosthetic devices using both traditional and modern technologies. 2. Fabricating and maintaining medical orthoses for various parts of the body. 3. Utilizing specialized equipment and machinery for molding, forming, cutting, and finishing in technical workshops. 4. Fitting and adjusting devices to meet the individualized needs of each patient. 5. Operating and maintaining supportive medical equipment used in rehabilitation and physical therapy.
Ethics	
Learning Outcomes 3	1. Learning how to interact effectively with others and work collaboratively as part of a team. 2. Adhering to professional ethics. 3. Respecting the dignity of the patient and their human needs. 4. Committing to occupational health and safety regulations in workshops and work environments.

9. Teaching and Learning Strategies

1. Theoretical lectures and practical laboratory training.
2. Discussion sessions and scientific updates.
3. Summer training in the public and private sectors.
4. Academic visits.
5. E-learning and educational videos.
6. Training courses.
7. Graduation research.

10. Evaluation methods

1. Monitor attendance and absence.
2. Theoretical and practical tests.
3. Monitor behavior and conduct in the classroom.
4. Monitor attendance at training sites and the extent of benefit.
5. Submit and discuss reports.
6. Discuss graduation projects.

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Lecturer	Mechanical engineering techniques	Theory of machines			Staff	
Lecturer	Electrical Power Engineering Technical	Electrical Power Engineering Technical			Staff	
Lecturer	linguistics and translation	translation			Staff	
Lecturer	water resources engineering	Irrigation			Staff	
Lecturer	Mechanical engineering	Materials			Staff	
assistant lecturer	Water Resources Engineering	Irrigation Engineering			Staff	
assistant lecturer	Electrical and Electronics engineering	Electrical and Electronics engineering			Staff	

Professional Development

Mentoring new faculty members

1- Teamwork skills.
2- Leadership skills and responsibility.

3- Training courses in the field of specialization. 4- Courses on teaching and learning. 5- Courses on how to publish scientific research.
Professional development of faculty members
1- Sending employees for training inside and outside the country. 2- Conducting field research related to prosthetics and orthotics. 3- Employing new and appropriate educational methods that serve the knowledge students have acquired and help them in various fields of work.

12.Acceptance Criterion
1- Central admission requirements approved by the Ministry of Higher Education and Scientific Research 2- Admission for both genders admission or others.

13.The most important sources of information about the program
1. Scientific curriculum and methodology 2. External academic resources (central libraries, the internet, and social media) 3. Seminars, workshops, and specialized courses.

14.Program Development Plan
1- Keeping pace with scientific developments in the field of specialization to keep pace with the labor market. 2- Updating lectures. 3- Using modern teaching methods. 4- Working to develop the department's educational laboratories. 5- Working to develop the department's educational fields.

Program Skills Outline																
				Required program Learning outcomes												
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2024-2025 / First	NTU100	Human rights and democracy	Basic												
	NTU101	English language	Basic	/	/			/				/			
	NTU102	computer	Basic	/				/	/			/	/		
	NTU103	Arabic language	Basic	/				/	/			/			
	NTU104	Sports	selective												
	MIT101	Mathematics	Basic	/				/				/			
	MIT102	Mechanical Workshops	Basic												
	MIT103	Engineering Drawing	Basic												
	ETMI100	Calculus	Basic	/				/	/			/			
	ETMI101	DC Current Circuits	Basic	/	/	/		/	/			/	/		
	ETMI102	AC Current Circuit	Basic	/				/				/			

	ETMP101	Analogue Electronic Principles	Basic	/				/				/			
	ETMI104	Analogue Electronic	Basic	/				/	/						
	ETMI105	Electronic workshop	Basic	/				/				/			
	ETMI108	Electrical workshop	Basic	/	/	/		/				/	/		
	ETMI109	Physics	Basic	/				/				/			
	ETMP102	Medical Physics	Basic	/				/				/			
	ETMP103	Principals of Medical Rehabilitation Methods	Basic	/	/	/		/				/	/		
	ETMI112	Medical Rehabilitation Methods	Basic	/	/	/		/				/	/		
2024-2025 / Second	NTU200	English language	Basic	/				/				/			
	NTU201	computer	Basic	/	/			/							
	NTU202	Arabic language	Basic	/				/				/			
	NTU203	Baath Party crimes in Iraq	Basic												
	NTU204	Professional ethics	Basic	/				/				/	/		

	MTI200	Research Project	Basic												
	MTI201	Specialized Workshop	Basic	/				/	/			/	/		
	MTI202	Application Project	Basic												
	MTI203	professional Safety	Basic												
	ETMI200	Electrical Measurements and Sensors	Basic	/	/			/				/	/		
	ETMI201	Basic Electronic Circuits	Basic	/				/	/			/	/		
	ETMI202	Principles of Microcomputer	Basic	/	/	/		/				/			
	ETMP201	Fabrication of Orthoses and Supports	Basic	/	/			/	/			/	/		
	ETMP202	Maintenance of Orthotic and Prosthetic Devices	Basic	/				/				/			
	ETMP203	Fabrication of Prosthetic Limbs	Basic	/		/		/	/			/			
	ETMI207	Advanced Electronic Circuits	Basic	/				/				/			
	ETMI209	Physiology	Basic	/		/		/	/			/			
	ETMI210	Maintenance of	Basic												

		Electromechanical Medical Instrumentations													
	ETMP204	Microprocessors	Basic	/		/		/	/			/			
	ETMI213	PLC	Basic	/	/			/	/			/	/		
	ETMI214	Renewable Energy Systems	selective	/				/				/			
	ETMI215	Computer Applications	selective		/				/				/		

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

Course Description Form

First Level / First Semester

English language

1. Course Name: English language	
2. Course Code: NTU 101	
3. Semester / Year: 1st semester/first year/courses	
4. Description Preparation Date: 1/ 7 / 2025	
5. Available Attendance Forms: mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(2 theoretical) weekly * 15 weeks = 30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Email:	
8. Course Objectives	
Course Objectives	1. Demonstrate understanding of fundamental grammar rules in academic writing contexts. 2. Develop analytical reading skills for interpreting academic English texts effectively. 3. Improve academic writing proficiency by composing clear, coherent, and well-structured texts
9. Teaching and Learning Strategies	
Strategy	1- Self-direction strategy. 2- Collaborative learning strategy. 3- Role-playing strategy. 4- Discussion and dialogue strategy. 5- Lecture strategy. 6- Research and discovery strategy.

	7- Brainstorming strategy.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Ability to Use Basic Grammar Rules	Hello	theoretical	Classroom and homework assignments, weekly and monthly exams
2	2	Correct application of tenses in sentences.	Your world	theoretical	Classroom and homework assignments, weekly and monthly exams
3	2	Understanding and using auxiliary verbs.	All about you	theoretical	Classroom and homework assignments, weekly and monthly exams
4	2	Improving Writing Skills	Family and friends	theoretical	Classroom and homework assignments, weekly and monthly exams
5	2	Writing short paragraphs with coherence and cohesion.	The way I live	theoretical	Classroom and homework assignments, weekly and monthly exams
6	2	Ability to write formal and informal letters.	Every day	theoretical	Classroom and homework assignments, weekly and monthly exams
7	2	Vocabulary Expansion.	My favourites	theoretical	Classroom and homework assignments, weekly and monthly exams
8	2	Learning new words e and using them in sentences.	Where I live	theoretical	Classroom and homework assignments, weekly and monthly exams
9	2	Knowing synonyms and antonyms of common word,	Times past	theoretical	Classroom and homework assignments, weekly and monthly exams
10	2	Regular& irregular, questions &negatives	We had a great time	theoretical	Classroom and homework assignments, weekly and monthly exams
11	2	Knowing synonyms and antonyms of common word	I can do that	theoretical	Classroom and homework assignments, weekly and monthly exams
12	2	Speaking and Pronunciation, signs all around	Please and thank you	theoretical	Classroom and homework assignments, weekly and monthly exams
13	2	Ability to engage	Here &	theoretical	Classroom and homework

		in simple and clear conversations.	now		assignments, weekly and monthly exams
14	2	Improving pronunciation and accurate word stress.	It's time to go	theoretical	Classroom and homework assignments, weekly and monthly exams
15	5	Scientific visit	Colleges of arts and education/ English dept.	theoretical	Discussion and dialogue

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

Daily preparation	10
1st month text	15
2nd month text	15
Final text	60

12.Learning and Teaching Resources

Required textbooks (curricular books, if any	not available
Main references (sources)	1- Beginner student's book, New headway plus
Recommended books and references (scientific journals, reports...)	1- Books on English language
Electronic References, Websites	Sites that care about English language

First Level / Second Semester

Computer

1. Course Name: Computer	
2. Course Code: NTU102	
3. Semester / Year: Second semester/second year/courses	
4. Description Preparation Date: 1/ 7 / 2025	
5. Available Attendance Forms: mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(1 theoretical +1 practical) weekly * 15 weeks = 30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Bassam abbas ali Email: bassamabbasalnajjar@ntu.edu.iq	
8. Course Objectives	
Objectives	1. Understand the basic components of a computer and how they work, as well as acquire skills in effective use of the operating system and file management. 2.Develop proficiency in using Microsoft Word to create and format professional documents. 3. Learn how to troubleshoot and resolve common errors when using a computer or word processing software.
9. Teaching and Learning Strategies	
Strategy	1. Self-direction strategy. 2. Collaborative learning strategy. 3. Continuous assessment strategies. 4. Discussion and dialogue strategy. 5. Lecture strategy. 6. Research and discovery

	strategy. 7. Active learning strategy.

10. Course structure

week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
1	2	1.The student will learn about the stages a computer goes through in its development and the generations it has passed through. 2. The student will master how to use the desktop environment and manage files.	Theoretical / Computer Phases and Generations Practical / Desktop in the Windows Operating System	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
2	2	1.The student will understand the characteristics of the electronic computer and the areas in which it is used. 2.The student will be able to use the Start menu and the Run dialog box to run programs and commands.	Theoretical / Electronic Computer (Features - Areas of Use) Practical / Start Menu and Command Dialog Box (RUN(Operating System (Windows)	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
3	2	1.The student will understand how to classify computers according to	Theoretical / Classification of Computers by Use Practical / Desktop	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams

		their uses. 2.The student will master customizing the Windows desktop and managing its features.	Features Operating System (Windows)		
4	2	1.The student will be able to distinguish between different types of computers and the uses of each according to their size. 2. The student will be able to manage and control various program windows within the Windows operating system.	Theoretical / Types of computers by size Practical / Working with program windows in the Windows operating system	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
5	2	1. The student will learn about the types and functions of basic computer input devices. 2. The student will create, organize, and manage files and folders effectively within the Windows operating system.	Theoretical / Physical structure of the computer (input devices(Practical / Files and folders in the operating system)Windows(	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
6	2	1.The student will understand the types and functions of basic computer output devices	Theoretical / Physical structure of the computer (output devices(Practical /	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams

		and how to connect them to perform tasks. 2. The student will perform operations to manage and recover deleted items using the Recycle Bin in Windows.	Dealing with the Recycle Bin in the Windows operating system		
7	2	1.The student will identify the external components of the system unit and understand their functions in detail. 2. The student will perform some tasks using the basic programs included with the Windows operating system.	Theoretical / External Parts of the System Unit Practical / Using Accessories	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
8	2	1.The student will become familiar with the internal components of the system unit and be able to explain their functions in detail. 2.The student will be able to solve computer problems using the help and support tools available within the Windows operating system.	Theoretical / Internal Parts of the System Unit Practical / How to Get Help with the Operating System (Windows)	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams

9	2	1.The student will be familiar with the functions of the central processing unit and types of secondary memory. 2. The student will create and edit documents using Microsoft Word 2010.	Theoretical / Central Processing Unit and Secondary Memory Practical / Word Processing Program (Microsoft Word 2010)	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
10	2	1.The student will identify the various ports on the back of the bag and understand the function of each port. 2. The student will master how to enter, format, and edit text effectively in Word 2010.	Theoretical / Back of System Box Ports Practical / Working with Text in Microsoft Word 2010	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
11	2	1. The student should become familiar with the different types of software that operate the computer and their functions, and be able to choose the software that serves the user. 2. The student should be able to adjust the layout of the program's page and determine the	Theoretical / Computer Software Practical / Page Layout in Microsoft Word 2010	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams

		appropriate type of paper and margins that should be used.			
12	2	1.The student will become familiar with digital storage capacity units and their uses, and will master how to convert from one unit to another. 2. The student will practice creating tables using various methods in the program and become proficient in entering various elements into tables.	Theoretical / Storage Units Page Layout in Microsoft Word 2010 Practical / Tables in Microsoft Word 2010	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
13	2	1.The student will be able to work with computer number systems, such as binary and decimal, and will be proficient in converting from one system to another. 2.The student will learn and be able to create tables in the program, link their elements, and demonstrate an	Theoretical / Number Systems in Computers Practical / Tables in Microsoft Word 2010	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams

		understanding of extracting final results from them.			
14	2	1.The student will become familiar with the computer platform and its main components, understand how the hardware and software components integrate so that the computer can perform the tasks for which it was designed, and understand how these components interrelate. 2. The student will learn the principles of text formatting to improve the appearance of documents in Word 2010.	Theoretical / Computer Platform Text Formatting in Microsoft Word 2010	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
15	2	1.The student will discuss how to identify and determine the specifications required for each type of computer use. 2. The student will master applying various formatting to texts to improve the	Theoretical / Main Features of a Personal Computer Practical / Text Formatting in Microsoft Word 2010	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams

		appearance of documents in Word 2010.			

11. Course Evaluation	
Grades are distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written tests, reports, etc	
Daily preparation	10
daily oral tests	20
monthly or written tests	40
Preparing reports	20
Practical activity	10

12. Learning and teaching resources	
Required textbooks (curriculum books, if available)	Remember all the textbooks if any
Main References (Sources)	Cite references (sources), if any. Computer and Office Applications Book, Part 1
Recommended books and references (scientific) journals, reports...	Write the name of the recommended reference for each course. 1- Books that focus on software.
Electronic references and websites	Remember the websites (such as the department's YouTube channel or any link that can be used according to the specialization Sites that are interested in software applications.

First Level / First Semester

Arabic Language

1. Course name: Arabic Language	
2. Course code: NTU103	
3. Semester/Year: First semester / First year / Courses	
4. Description Preparation Date: 1/ 7 / 2025	
5. Available Attendance Forms: mandatory	
6. Number of Credit Hours (Total) : (2 theoretical) per week x 15 weeks = 30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Bassam abbas ali Email: bassamabbasalnajjar@ntu.edu.iq	
8. Course Objectives	
Objectives	The objective of studying the Arabic language course is to: 1. Provide students with the skill of speaking fluent Arabic, free from colloquialisms, and to address common errors. 2. Develop students' linguistic wealth and raise their awareness of the importance of the Arabic language as a tool for thought and a means of expression within themselves and their community. This will encourage students to embrace learning it with conviction and interest. 3.Developing the ability to compose sentences, avoiding writing words with common mistakes, and how to formulate an administrative letter.

9. Teaching and Learning Strategies	
Strategy	.1 Self-direction strategy. 2. Collaborative learning strategy. .3 Role-playing strategy. .4 Discussion and dialogue strategy. .5 Lecture strategy. .6Brainstorming strategy.

10. Course structure

week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
1	2	The student should become familiar with the concept of linguistic errors and master writing the open and connected taa.	1. The concept of linguistic errors 2. Rules for writing open and closed taa	Theoretical	Classroom and homework assignments, weekly and monthly exams
2	2	The student must adhere to the rules for writing the extended and shortened alif, and must recognize and differentiate between the solar and lunar letters.	1. The extended and shortened alif 2. The solar and lunar letters	Theoretical	Classroom and homework assignments, weekly and monthly exams
3	2	The student should pay attention to the difference between the letters “Ḍad” and “Ḍadh” and master their use.	Dad and Tha	Theoretical	Classroom and homework assignments, weekly and monthly exams
4	2	The student should be able to distinguish between the hamzat al-wasl and the hamzat al-qata’, the places where each is used, and the rules for writing the medial and final hamza.	Writing the Hamza: -Connecting and disconnecting -The medial Hamza -The extreme Hamza	Theoretical	Classroom and homework assignments, weekly and monthly exams
5	2	The student should become familiar with the types of punctuation marks used in the language and their uses, especially in formal correspondence.	punctuation marks	Theoretical	Classroom and homework assignments, weekly and monthly exams
6	2	The student should observe the differences between nouns and verbs and be able to distinguish between them.	Noun, verb, and the difference between them	Theoretical	Classroom and homework assignments, weekly and monthly exams

7	2	To be able to distinguish between the direct object and the absolute object, and to master parsing.	Objects: -The direct object -The absolute object	Theoretical	Classroom and homework assignments, weekly and monthly exams
8	2	The student should demonstrate a complete understanding of the object of purpose, the object of place, and the object of accompaniment, and be able to parse each of them.	-The object for which -The object in which - The object with	Theoretical	Classroom and homework assignments, weekly and monthly exams
9	2	The student must adhere to the rules for writing numbers and counted items.	number	Theoretical	Classroom and homework assignments, weekly and monthly exams
10	2	The difference between the hamzat al-wasl and the hamzat al-qata' and the places where each is used	Common language errors applications		
11	2	The student will extract most of the common linguistic errors in society and how to spread their correction in society.	Common language errors applications	Theoretical	Classroom and homework assignments, weekly and monthly exams
12	2	The student should be able to recognize the meanings of prepositions, easily distinguish the distinguishing alif in the Arabic language, and clearly understand the rule of nun and tanween.	Meanings of prepositions. The rule of the distinguishing alif. The rule of the nun and tanween.	Theoretical	Classroom and homework assignments, weekly and monthly exams
13	2	The student should take into account the formal aspects of the administrative letter and memorize it correctly.	Formal aspects of administrative discourse	Theoretical	Classroom and homework assignments, weekly and monthly exams
14 - 15		The student should be able to formulate an administrative letter in a language free of errors.	The language of administrative discourse	Theoretical	Classroom and homework assignments, weekly and monthly exams

11. Course Evaluation	
Grades are distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written tests, reports, etc	
Daily preparation	10

daily oral tests	20
monthly or written tests	50
Preparing reports	20
Learning and teaching resources	
Required textbooks (curriculum books, if available)	Remember all the textbooks if any.
Main References (Sources)	The unified Arabic language curriculum taught in all departments of the Technical Institute / Mosul
Recommended books and references (scientific) journals, reports...	All language dictionaries, books and writings of linguists and grammarians.
Electronic references and websites	Sites that are interested in the Arabic language

First Level / First Semester

Mathematics

1. Course Name: Mathematics					
2. Course Code: MIT100					
3. Semester / Year: First semester/ First year/courses					
4. Description Preparation Date: 1/7/2025					
5. Available Attendance Forms: mandatory					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 weekly * 15 weeks = 30 hours					
7. Course administrator's name (mention all, if more than one name)					
Name: Sawla Taha Hamed Email: sawla99@ntu.edu.iq					
8. Course Objectives					
Course Objectives	1. Learning The student, the mathematical basics necessary to understand and analyses quantitative phenomena using the principles of mathematics. 2. Enabling The student to apply these principles in technical and applied fields within his technical specialization. 3. Developing t of computational and analytical skills on The student. 4. Enabling the student to perform the basic calculations and algebraic operations accurately and quickly.				
9. Teaching and Learning Strategies					
Strategy	1- Self-direction strategy. 2- Collaborative learning strategy. 3- Role-playing strategy. 4- Discussion and dialogue strategy. 5- Lecture strategy. 6- Research and discovery strategy. 7- Brainstorming strategy.				
10. Course Structure					
Week	**Hours**	**Required**	**Unit or subject**	**Learning**	**Evaluation**

		Learning Outcomes	name	method	method
1	2	The student should learn the concept of matrices	Introduction to matrices	Theoretical	Classroom and homework assignments
2	2	The student should learn the Types of matrices, algebraic operations on matrices	Types of matrices, algebraic operations on matrices	Theoretical	Classroom and homework assignments, weekly exams
3	2	The student should learn how to calculate the value of determinants for the matrices	Find the determinants for the matrices	Theoretical	Classroom and homework assignments, weekly and monthly exams
4	2	The student should learn Solving linear equations	Solving linear equations	Theoretical	Classroom and homework assignments, weekly and monthly exams
5	2	The student should learn	The Kramer method, its applications	Theoretical	Classroom and homework assignments, weekly and monthly exams
6	2	The student will learn how to apply the Kramer rule to solve linear equations	Introduction to vectors, algebraic operations on vectors, add and subtraction of vectors, multiplying a constant in the vector, finding the length of the vector	Theoretical	Classroom and homework assignments, weekly and monthly exams
7	2	The student will learn the Algebraic multiplication of vectors, directional multiplication of vectors	Algebraic multiplication of vectors, directional multiplication of vectors	Theoretical	Classroom and homework assignments, weekly and monthly exams
8	2	The student will learn how to Find the angle between two vectors, find the vertical vector on two vectors	Find the angle between two vectors, find the vertical vector on two vectors	Theoretical	Classroom and homework assignments, weekly and monthly exams
9	2	The student should know the types of algebraic functions	Algebraic functions	Theoretical	Classroom and homework assignments,

					weekly and monthly exams
10	2	To understand the student, the Trigonometric functions	Trigonometric functions	Theoretical	Classroom and homework assignments, weekly and monthly exams
11	2	The student will able to draw trigonometric functions	Drawing trigonometric functions	Theoretical	Classroom and homework assignments, weekly and monthly exams
12	2	To understand the student, the Exponential functions	Exponential functions	Theoretical	Classroom and homework assignments, weekly and monthly exams
13	2	The student will able to student the Logarithmic functions, natural logarithms	Logarithmic functions, natural logarithms	Theoretical	Classroom and homework assignments, weekly and monthly exams
14	2	The student will able to draw the Exponential and logarithmic functions	Drawing the elecial and logarithmic functions	Theoretical	Classroom and homework assignments, weekly and monthly exams
15	2	To understand the student, the difference between apparent function and the implied function	The apparent function, the implied function	Theoretical	Classroom and homework assignments, weekly and monthly exams

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

Daily preparation	10
Daily oral exam	10
Classroom activity	10
Monthly and written tests	40
Reporting	20
Practical activity	10

12. Learning and Teaching Resources

Required textbooks (curricular books, if any	
Main references (source	1- Thomas Calculus by George B. Thomas, JR. 2 Calculus by Frank Ayers

Recommended books ar references (scientific journals, reports...)	1-Panal calter “Technical Mathematics” 2- Murray R. “ Mathematical handbook” 3- Shantinarayam “ Engineering Mathematics part 1 – 1987” 4- Garlick B. “ Technical Mathematics” 1981.
Electronic References, Websites	https://youtube.com/@alihasanali?si=7pfr85WMfs5U9hw1

First Level / second Semester

Mathematics

1. Course Name: Calculus					
2. Course Code: MIT103					
3. Semester / Year: second semester/ First year/courses					
4. Description Preparation Date: 1/7/2025					
5. Available Attendance Forms: mandatory					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 weekly * 15 weeks = 30 hours					
7. Course administrator's name (mention all, if more than one name)					
Name: Sawla Taha Hamed Email: sawla99@ntu.edu.iq					
8. Course Objectives					
Course Objectives	1. Introducing the student to using mathematics in other scientific topics and increasing his ability to think logically when solving exercises. 2. increasing his ability and how to link data with his information to obtain a solution to the problem. 3. Providing the student with information to increase the logical ideas to solve any problem. 4. Providing the student with information about the conecting of the giving data with his information				
9. Teaching and Learning Strategies					
Strategy	1- Self-direction strategy. 2- Collaborative learning strategy. 3- Role-playing strategy. 4- Discussion and dialogue strategy. 5- Lecture strategy. 6- Research and discovery strategy. 7- Brainstorming strategy.				
10. Course Structure					
Week	Hours	Required	Unit or	Learning	Evaluation method

		Learning Outcomes	subject name	method	
1	2	1- The student should know how to derivative the algebraic functions 2- The student will be able to use chain base 3- The student will be able to derive implied function	Derivative, derivative of algebraic functions, chain base applications, implied function	Theoretical	Classroom and homework assignments, weekly and monthly exams
2	2	The student will be able to derive the exponential function and logarithmic function .	The derivative of the exponential function, the derivative of the logarithmic function	Theoretical	Classroom and homework assignments, weekly and monthly exams
3	2	The student will be able to derive the trigonometric functions and circular functions	The derivative of the trigonometric function, the derivative of circular functions	Theoretical	Classroom and homework assignments, weekly and monthly exams
4	2	The student will be able to solve the Partial differentiation	Partial differentiation	Theoretical	Classroom and homework assignments, weekly and monthly exams
5	2	The student should know how to find the integration of the exponential and logarithmic functs	Integration of exponential and logarithmic functions	Theoretical	Classroom and homework assignments, weekly and monthly exams
6	2	The student should know how to find the integration of the trigonometric functions	Integration of trigonometric functions	Theoretical	Classroom and homework assignments, weekly and monthly exams
7	2	The student should be able to perform the specific integration and calculate (the area under the curve), (the area between two curves)	Definite integral, applications (distance under the curve, distance between the curve)	Theoretical	Classroom and homework assignments, weekly and monthly exams

8	2	The student should learn to find the rotational volumes and the arc length of the curve	The rotational magnitudes and arc length of the curve	Theoretical	Classroom and homework assignments, weekly and monthly exams
9	2	The student should know the approximation in integration and the trapezoid rule, the Simpson rule	Approximation in integration (trapezoid rule, Simpson's rule)	Theoretical	Classroom and homework assignments, weekly and monthly exams
10	2	The student should know the Integration methods, retail integration	Integration methods, retail integration	Theoretical	Classroom and homework assignments, weekly and monthly exams
11	2	The student should learn integration in the manner of compensation	Integration by compensation method	Theoretical	Classroom and homework assignments, weekly and monthly exams
12	2	student should learn the integration of partial fractions	Integration by partial fraction method	Theoretical	Classroom and homework assignments, weekly and monthly exams
13	2	The student should be able to solve differential equations of the first order and the first separate homogeneous degree	Solving differential equations of first order and first order, discrete homogeneous	Theoretical	Classroom and homework assignments, weekly and monthly exams
14	2	The student should understand differential equations - linear - and their applications	Differential equations - linear - applications	Theoretical	Classroom and homework assignments, weekly and monthly exams
15	2	The student should learn compound numbers, collect, subtract and divide – multiply	Complex numbers - addition - subtraction - division - multiplication	Theoretical	Classroom and homework assignments, weekly and monthly exams

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such

as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Daily preparation	10
Daily oral exam	10
Classroom activity	10
Monthly and written tests	40
Reporting	20
Practical activity	10

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any	
Main references (source	1- Thomas Calculus by George B. Thomas, JR. 2 Calculus by Frank Ayers
Recommended books an references (scientific journals, reports...)	1-Panal calter “Technical Mathematics” 2- Murray R. “ Mathematical handbook” 3- Shantinarayam “ Engineering Mathematics part 1 – 1987” 4- Garlick B. “ Technical Mathematics” 1981.
Electronic References, Websites	https://youtube.com/@alihasanali?si=7pfr85WMfs5U9hw1

First Level / Second Semester

Engineering Drawing

1. Course: Engineering Drawing	
2. Course Code :MTI102	
3. Semester / Year: Second Semester / First Year / Courses	
4. Date of preparation of this description: 1/7/2025	
5. Available Forms of Attendance: Mandatory	
6. Number of Credit Hours (Total)	
(4 practical) per week * 15 weeks = 60 hours	
7. Course administrator name (list all names, if more than one)	
8. Course Objectives (General Objectives of the Course)	
Objectives	1. This course provides a necessary summary of the most important characteristics of AutoCAD as follows: Definition of engineering drawing orders 2. Communicate design concepts and its goal using a unified pictorial language consisting of forms, symbols and its uses, engineering drawing tools. Types of geometric lines and their uses, exercises + function. 3. Computer drawing geometric shapes (rectangle, parallelogram, square, circle) exercises + function. Dimensions and how to put on the drawing. Principles of projection in geometric drawing) simple shapes (projection drawing and three-dimensional drawing). Cartesian on three levels. Uncomplicated, medium forn Complexity, complex geometric shapes
9. Teaching and Learning Strategies	
Strategy	1- Self-direction strategy. 2- Participatory learning strategy. 3- Role-playing strategy. 4- Discussant and dialogue strategy.

	5- Lecture strategy. 6- Research and discovery strategy. 7- Brainstorming strategy.

10.Course structure

week	Hours	Required Learning Outcomes	Unit / Subject Name	Method of education	Evaluation method
1	4	Introduction to AutoCAD	Introduction to Orders and Directives	Theoretical + Practical	Class assignments and weekly and monthly exams
2	4	Perspective Drawing ISO Miter	Panels that only include the use of fonts	practical	Class assignments and weekly and monthly exams
3	4	Perspective Drawing ISO Miter	Panels involving the use of lines and cylinder	practical	Classroom and home assignments and weekly and monthly exams
4	4	Perspective Drawing ISO Miter	Plates involving the use of lines, cylinder and cavities	practical	Class assignments and weekly and monthly exams
5	4	Perspective Drawing ISO Miter	Paintings involving the use of lines and drawing distractions	practical	Classroom and home assignments and weekly and monthly exams
6	4	drawing shapes with inclination at an angle in the ISO,	Application of the use of angles in ISO Metrek	practical	Class assignments and weekly and monthly exams
7	4	Perspective Drawing ISO Miter	Drawing different paintings that ensure lines, deviations and cavities	practical	Class assignments and weekly and monthly exams
8	4	Perspective Drawing ISO Miter	Drawing different and complex paintings	practical	Class assignments and weekly and

					monthly exams
9	4	Introduction to projections	Introduction to the axes and how to define the perspective interface	practical	Class assignments and weekly and monthly exams
10	4	Drawing projections	Draw projections for simple shapes with lines only	practical	Class assignments and weekly and monthly exams
11	4	Drawing projections	draw the three projections of cylindrical shapes,	practical	Class assignments and weekly and monthly exams
12	4	Drawing projections	Drawing the three projections of hollow shapes,	practical	Class assignments and weekly and monthly exams
13	4	Drawing projections	draw the three projections of oblique shapes (angled deviation)	practical	Class assignments and weekly and monthly exams
14	4	Drawing projections	Drawing the three projections of hollow and inclined cylindrical shapes,	practical	Class assignments and weekly and monthly exams
15	4	Drawing projections	Drawing the Three Projections of Complex Shapes,	practical	Class assignments and weekly and monthly exams

11. Course Evaluation

Distribution of grades out of 100 according to the tasks assigned to the student such as daily preparation, daily oral tests, monthly or written tests, reports... Etcetera.

Daily preparation	10
Daily Operation Testing	25
Monthly and practical testing	50
Practical activity	15

12. Learning and Teaching Resources	
Required textbooks (curriculum books, if applicable)	Remember all textbooks, if any.
Main references (sources)	Remember references (sources) if any 1. A variety of engineering sketchbooks prepared by the department
Recommended books and references (scientific journals, reports...)	Write the name of the recommended reference for each course 1- Books that are concerned with applied engineering drawing 2- Reports on applied engineering drawing.
Websites & References	Remember the websites (such as the departmen YouTube channel or any link that can be us according to the specialization Sites that are interested in applied engineeri drawing.

Second Level / Second Semester

Renewable energy

1. Course Name: Renewable energy	
2. Course Code: ETMI214	
3. Semester / Year: Second semester/first year/courses	
4. Description Preparation Date: 1/ 7 / 2025	
5. Available Attendance Forms: mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(2 theoretical + 3 practical) weekly * 15 weeks = 75 hours	
7. Course administrator's name (mention all, if more than one name)	
8. Course Objectives	
Course Objectives	1- Providing students with ba knowledge about renewable ener sources and their applications. 2- Promote sustainability concepts a equip them with the practical ski necessary to install, operate, and mainta renewable energy systems, thus prepari them for the labor market and contributi to finding clean energy solutions.

	3- Introducing students to mode technologies used in this field. The cou also seeks to develop their environmen awareness.

9. Teaching and Learning Strategies

Strategy	1- Self-direction strategy. 2- Collaborative learning strategy. 3- Role-playing strategy. 4- Discussion and dialogue strategy. 5- Lecture strategy. 6- Research and discovery strategy. 7- Brainstorming strategy.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	1- The student will be introduced to the basic concepts of renewable energy and its sources. 2- The student will appreciate the importance of using renewable energy sources in reducing pollution and preserving the environment.	Introduction to Renewable Energy	theoretical	Classroom and homework assignments, weekly and monthly exams
1	3	The student should use appropriate measuring tools to determine the intensity of solar radiation or wind speed.	Learn about safety tools and measurements in the energy lab.	practical	Classroom and homework assignments, weekly and monthly exams
2	2	The student will understand the characteristics, advantages and disadvantages of each type of renewable energy.	The difference between traditional and renewable energy, the importance of renewable energy	theoretical	Classroom and homework assignments, weekly and monthly exams
2	3	The student will be able to measure solar radiation using a solar meter.	solar energy Measuring solar radiation using a solar meter	practical	Classroom and homework assignments, weekly and monthly exams
3	2	The student will compare	Solar Energy -	theoretical	Classroom

		renewable energy and conventional energy in terms of environmental impact, cost, and sustainability.	Basics Solar Radiation - Solar Cells - System Components		and homework assignments, weekly and monthly exams
3	3	The student will install a small solar energy system in a laboratory or training project.	Learn about the components of a photovoltaic (PV) solar system	practical	Classroom and homework assignments, weekly and monthly exams
4	2	The student will be able to predict future developments in the field of renewable energy in Iraq and the world.	Solar energy systen (photovoltaic syster PV - thermal systen	theoretical	Classroom and homework assignments, weekly and monthly exams
4	3	The student will be able to connect a simple circuit for a solar system.	solar energy Connecting a simple circuit for a solar photovoltaic system to power a small load	practical	Classroom and homework assignments, weekly and monthly exams
5	2	The student will learn about the industrial and technical applications of renewable energy in the fields of refrigeration, air conditioning, or electricity.	solar energy Solar thermal collectors (Flat Plate - Evacuated Tube).	theoretical	Classroom and homework assignments, weekly and monthly exams
5	3	The student will learn about the applications of solar heaters.	solar energy Home and industrial solar heater applications	practical	Classroom and homework assignments, weekly and monthly exams
6	2	The student will be able to calculate the efficiency of solar energy.	Solar energy efficiency calculation	theoretical	Classroom and homework assignments, weekly and monthly exams
6	3	The student will be able to assemble and operate a typical solar heater – recording	solar energy Assembly and operation of a	practical	Classroom and homework

		temperatures.	typical solar water heater – recording temperatures		assignments, weekly and monthly exams
7	2	The student should know the components of turbines.	wind energy Turbine components, design, and uses in energy production..	theoretical	Classroom and homework assignments, weekly and monthly exams
7	3	The student will construct a simple model of a wind turbine power system.	wind energy Wind turbine assembly and explanation of its basic components (educational model).	practical	Classroom and homework assignments, weekly and monthly exams
8	2	The student will be able to calculate the efficiency of wind energy.	wind energy Wind energy efficiency calculation	theoretical	Classroom and homework assignments, weekly and monthly exams
8	3	The student calculates the efficiency of a wind turbine at different air speeds.	wind energy Calculating wind turbine efficiency at different wind speeds	practical	Classroom and homework assignments, weekly and monthly exams
9	2	The student will learn about the geothermal energy and its use in cooling and heating.	geothermal energy Geothermal energy and its use in cooling and heating	theoretical	Classroom and homework assignments, weekly and monthly exams
9	3	The student should be able to distinguish between the applications of geothermal energy in winter and summer.	geothermal energy geothermal energy applications	practical	Classroom and homework assignments, weekly and monthly exams
10	2	1- The student should understand hydropower. 2- The student should explain the generation of energy from water (hydroelectricity).	Hydro energy Hydro energy - generating energy from water (hydroelectricity)	theoretical	Classroom and homework assignments, weekly and

					monthly exams
10	3	The student will be able to distinguish between the types of hydropower plants.	Hydro energy Types of Hydropoenergy Plants (Educational Video)	practical	Classroom and homework assignments, weekly and monthly exams
11	2	The student should differentiate between the types of water turbines.	Hydro energy Hydropower Applications Explanation of Types of Hydro Turbines	theoretical	Classroom and homework assignments, weekly and monthly exams
11	3	The student should know the components of the Pelton turbine.	Hydro energy Pelton Turbine Components	practical	Classroom and homework assignments, weekly and monthly exams
12	2	The student should distinguish between bioenergy and biomass.	Bioenergy and biomass	theoretical	Classroom and homework assignments, weekly and monthly exams
12	3	The student will be able to identify the types of biofuels.	Biofuel Types of biofuels, biogas production, heating applications	practical	Classroom and homework assignments, weekly and monthly exams
13	2	The student converts biomass into energy (thermal, electrical, biofuel)	Bioenergy Converting biomass to energy (thermal, electrical, biofuel)	theoretical	Classroom and homework assignments, weekly and monthly exams
13	3	The student will be able to identify the use of heat generated from the combustion of biomass to produce electricity.	Bioenergy Using the heat produced by burning biomass to produce electricity.	practical	Classroom and homework assignments, weekly and monthly exams

14	2	The student will understand the process of decomposition of organic matter by bacteria in the absence of oxygen to produce methane gas.	anaerobic digestion The process of decomposition of organic matter by bacteria in the absence of oxygen to produce methane gas.	theoretical	Classroom and homework assignments, weekly and monthly exams
14	3	To introduce the student to biodiesel.	Biodiesel Biodiesel (liquid fuel obtained from vegetable oils or animal fats)	practical	Classroom and homework assignments, weekly and monthly exams
15	5	1- The student should learn how hydropower plants work. 2- The student should take responsibility for using natural resources in sustainable ways. 3- The student must demonstrate keenness to apply ethical and professional standards in field work.	Hydropower Scientific visit	Theoretical + practical	Discussion and dialogue

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

Daily preparation	10
Daily oral exam	20
Monthly and written tests	40
Reporting	20
Practical activity	10

12.Learning and Teaching Resources

Required textbooks (curricular books, if any	not available
Main references (sources)	1- Renewable Energy: Power for a Sustainable Future 2- Solar Engineering of Thermal Processes 3- Wind Energy Explained: Theory, Design and Application
Recommended books and references (scientific journals, reports...)	1- Books on renewable energy. 2- Reports on renewable energy.
Electronic References, Websites	https://www.youtube.com/watch?v=mh51mAUexK4&list=PLwdnzlV3ogoXUifhvYB65lLJCZ74o_fAk

Second Level / Second Semester

English language

1. Course Name: English language	
2. Course Code: NTU 200	
3. Semester / Year: 2nd semester/2nd year/courses	
4. Description Preparation Date: 1/ 7 / 2025	
5. Available Attendance Forms: mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(2 theoretical) weekly * 15 weeks = 30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Email:	
8. Course Objectives	
Course Objectives	**1-**1. Demonstrate understanding of fundamental grammar rules in academic writing contexts. 2. Develop analytical reading skills for interpreting academic English texts effectively. 3. Improve academic writing proficiency by composing clear, coherent, and well-structured texts
9. Teaching and Learning Strategies	
Strategy	1- Self-direction strategy. 2- Collaborative learning strategy. 3- Role-playing strategy. 4- Discussion and dialogue strategy. 5- Lecture strategy.

	6- Research and discovery strategy. 7- Brainstorming strategy.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Extracting key information from lectures or conversations.	Getting to know you	theoretical	Classroom and homework assignments, weekly and monthly exams
2	2	Reading and Comprehending Complex Texts	The way we live	theoretical	Classroom and homework assignments, weekly and monthly exams
3	2	Understanding both literary and non-literary texts at an advanced level.	It all went wrong	theoretical	Classroom and homework assignments, weekly and monthly exams
4	2	Analyzing texts and extracting their underlying meanings	Let’s go shopping	theoretical	Classroom and homework assignments, weekly and monthly exams
5	2	Interaction in Real-Life Situations	What do you want to do	theoretical	Classroom and homework assignments, weekly and monthly exams
6	2	Ability to communicate in everyday situations	Tell me what is it like	theoretical	Classroom and homework assignments, weekly and monthly exams
7	2	Understanding English-Speaking Cultures	fame	theoretical	Classroom and homework assignments, weekly and monthly exams
8	2	Deliver short oral presentations in English.	Do's and dont's	theoretical	Classroom and homework assignments, weekly and monthly exams
9	2	Use new English vocabulary in appropriate	Going places	theoretical	Classroom and homework assignments,

		contexts.			weekly and monthly exams
10	2	Write clear and coherent sentences and short paragraphs.	Scared to death	theoretical	Classroom and homework assignments, weekly and monthly exams
11	2	Passives and nouns and verbs	Things that changed the world	theoretical	Classroom and homework assignments, weekly and monthly exams
12	2	Expand vocabulary with new words and phrases regularly	Dreams and reality	theoretical	Classroom and homework assignments, weekly and monthly exams
13	2	Analyze English texts and deduce main ideas and details..	Earning a living	theoretical	Classroom and homework assignments, weekly and monthly exams
14	2	Understand spoken English in everyday conversations	Family ties	theoretical	Classroom and homework assignments, weekly and monthly exams
15	5	Scientific visit	Colleges of arts and education/English dept.	Theoretical	Discussion and dialogue

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

Daily preparation	10
1st month text	15
2nd month text	15
Final text	60

12.Learning and Teaching Resources

Required textbooks (curricular books, if any	not available
Main references (sources)	1- Beginner student's book, New headway plus
Recommended books and references (scientific journals, reports...)	1- Books on English language
Electronic References, Websites	Sites that care about English language

Second Level / first Semester

Computer

1. Course Name: Computer	
2. Course Code: NTU201	
3. Semester / Year: first semester/second year/courses	
4. Description Preparation Date: 1/ 7 / 2025	
5. Available Attendance Forms: mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(1 theoretical +1 practical) weekly * 15 weeks = 30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Bassam abbas ali Email: bassamabbasalnajjar@ntu.edu.iq	
8. Course Objectives	
Objectives	The student will learn basic computer security concepts, types of malware (such as viruses and spyware), and methods for protection against them. The student will distinguish between different types of software licenses (such as free, paid, and open source), and understand the importance of intellectual property rights to avoid legal problems. The student will understand common methods of cyber attacks, such as phishing and distributed denial of service (Dos) attacks, and learn how to secure their personal data online. The student will gain basic knowledge about operating systems (such as Windows, Linux, and macOS) and their classifications, as well as an understanding of network components and their requirements. The student will master the skills of using

	PowerPoint to create professional presentations, and master the basic principles of Excel to enter data and perform simple calculations. 6. Harmful effects Computers and Public Health: The student understands the potential health effects of excessive computer use, such as eye strain and back pain, and learns how to adopt correct sitting and working postures to ensure physical safety.
Strategy	1. Self-directed strategy. 2. Collaborative learning strategy. 3. Role-playing strategy. 4. Discussion and dialogue strategy. 5. Research and discovery strategy. 6. Brainstorming strategy. 7. Project-based learning strategy. 8. Learning through problem-solving strategy.

10. Course structure

week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
1	**2**	- The student must ensure the safety of both personal and public computers - The student must adhere to globally recognized cyber ethics. - The student must be able to identify various forms of cyber bullying in the digital world. - The student must understand the importance and privacy of computers. - The student must be fully familiar with the presentation software interface and be proficient in operating the program and interacting smoothly with the user interface.	Theoretical / Computer Security and Software Licensing -Cyber Ethics -Types of Abuse in the Digital World -Computer Privacy Practical / Presentation Program (Power Point) -Purpose of the Program -Program Operation -User Interface	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams
2	**2**	- The student must identify the types of software and application licenses and adhere to their standards . - The student must be able to open and edit saved documents .	Theoretical / Computer Software Licenses. Practical / Presentation Program (Power Point.(-Opening saved	Theoretical + practical	Classroom and homework assignments, weekly and monthly exams

		- The student must be able to save documents after creating or editing them.	documents. -Closing and saving documents.		
3	**2**	- The student will be able to identify the sources of cyber-attacks - Demonstrate a commitment and awareness to avoiding them . - The student will be able to list the elements of the home page tab in the presentation program . - Be able to use each element correctly.	Theoretical/Cyber Hacking Practical/Power Point Presentation - Home tab	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams
4	**2**	- The student should understand the danger of malware . - The student should know its types and seek ways to avoid it . - The student should fully understand the elements of the Insert tab . - The student should be proficient in dealing with it in the presentation program.	Theoretical / Malware Practical / PowerPoint Presentation - Insert Tab.	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams
5	**2**	- The student will gain a comprehensive understanding of how computers can harm public health, especially in the long term, and will learn the correct sitting position . - The student will be able to distinguish between the elements of the design tab and begin designing their own templates to use according to their needs.	Theoretical: The harms of computers on public health. Practical: Presentation program (Power Point) - Design tab.	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams
6	**2**	- The student will demonstrate a scientific understanding of the operating system, identify its functions, and understand the objectives for which it was designed . - The student will be able to link the elements of the transition tab with the elements selected when designing specific documents . - The student will be able to	Theoretical / Operating Systems - Definition of Operating Systems - Functions of Operating Systems - Objectives of Operating Systems - Practical / Presentation Program)Power Point(	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams

		easily create a clear and distinctive document .	- Transitions Tab		
7	**2**	-The student should be able to classify operating systems according to the number of users or the nature of the system being used. -The student should perform some movements that add a distinctive elegance to the templates.	Theoretical / Operating Systems Classification: - By System Nature - By Users Practical / Presentation Program)Power Point(- Animations Tab	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams
8	**2**	-The student will identify the differences between various operating systems. -The student will be able to identify the pros and cons of each system, enabling them to optimally select the appropriate operating system for their use. -The student will be able to determine the appropriate presentation method for each slide, based on its content and the elements that should be emphasized during the presentation.	Theoretical / Examples of some operating systems : DOS operating system- - Mac operating system - Windows operating system - Linux operating system - Android operating system . Practical / Presentation program)Power Point(- Slideshow tab .	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams
9	**2**	-The student should be able to identify the system requirements to determine whether or not it can be used on their personal computer. -The student should master the use of the Review tab to note strengths and weaknesses in the design, and review and correct spelling errors before exporting the template.	Theoretical / Windows 7 - System requirements - New features in the system - Practical / Presentation program)Power Point(- Review tab	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams
10	**2**	-The student will become familiar with the nature of the network. -The student will be able to list the types of networks. -The student will be able to choose the appropriate method for comprehensive presentation. -The student will be able to explain and present the template simultaneously, so	Theoretical / Networks - Network - Types of Networks Practical / Presentation Program)Power Point(- View Tab	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams

		that the idea is fully conveyed to the recipient.			
11	**2**	-The student will discuss the communication media used in networks and list the protocols used in networks, with the ability to determine the appropriate protocol for each network operation. -The student will become familiar with the spreadsheet program. -The student will fully understand its importance and the possibilities of its use, in addition to how to open the program.	Theoretical / Networks - Communication Media - Protocols Practical / Excel - Program Concept - Program Benefits - Opening the Program	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams
12	**2**	-The student will demonstrate an understanding of the advantages of the network. -Record his information about network requirements and fully understand what internet service is and what it can offer. -The student will begin working with a spreadsheet program. -Familiarize himself with the data the program handles.	Theoretical / Networks - Student Benefits - Computer Network Requirements - The Internet - What the Internet Offers Practical / Excel - Program Interface - Basic Data Types and How to Enter Them	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams
13	**2**	-The student will be familiar with the types of services offered by the Internet. -They will have a thorough understanding of how the Internet works. -They will be able to explore various websites themselves. -They will create a workbook and learn how to work with a worksheet.	Theoretical / Networks - Main Internet Services - How the Internet Works - Websites Practical / Excel - Working with Worksheets	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams
14	**2**	-The student will understand what search engines are. -Understand what a browser is and its uses. -Understand the capabilities of Internet Explorer. -The student will be prepared to choose the appropriate browser for their use. -Master how to work with	Theoretical / Networks - Search Engines - Browsers - Internet Explorer Practical / Excel - Working with Cells	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams

		spreadsheet cells.			
15	**2**	-The student should begin utilizing the capabilities of popular search engines. -The student should utilize the capabilities of the search engine (Google) in his study requirements, such as writing reports, searching for information that will help him in his studies, preparing reports, and graduation projects. -The student should apply the correct method for creating new workbooks. -The student should learn how to save and maintain documents. -The student should open saved documents, edit them, and then re-save them correctly.	Theoretical / Networks - Using popular search engines - The search engine (Google) Practical / Excel - How to create a new workbook - Saving the workbook - Opening saved workbooks.	Theoretic al + practical	Classroom and homework assignments, weekly and monthly exams

11. Course Evaluation

Grades are distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written tests, reports, etc

Daily preparation	10
daily oral tests	20
monthly or written tests	40
Preparing reports	20
Practical activity	10

12. Learning and teaching resources

Required textbooks (curriculum books, if available)	Remember all the textbooks if any
Main References (Sources)	Cite references (sources), if any. Computer and Office Applications Book,
Recommended books and references (scientific) journals, reports...	Write the name of the recommended reference for each course. 1- Books that focus on software.
Electronic references and websites	Remember the websites (such as the department's YouTube channel or any link that can be

	used according to the specialization Sites that are interested in computer , networks ,and software applications.

Second Level / Second Semester

Arabic Language

1. Course name: Arabic Language	
2. Course code: NTU202	
3. Semester/Year: Second semester / Second year / Courses	
4. Description Preparation Date: 1/ 7 / 2025	
5. Available Attendance Forms: mandatory	
6. Number of Credit Hours (Total) : (2 theoretical) per week x 15 weeks = 30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Bassam abbas ali Email: bassamabbasalnajjar@ntu.edu.iq	
8. Course Objectives	
Objectives	The objective of studying the Arabic language course is to: 1. Provide students with the skill of speaking fluent Arabic, free from colloquialisms, and to address common errors. 2. Develop students' linguistic wealth and raise their awareness of the importance of the Arabic language as a tool for thought and a means of expression within themselves and their community. This will encourage students to embrace learning it with conviction and interest. 3.Developing the ability to compose sentences, avoiding writing words with common mistakes, and how to formulate an administrative letter.
9. Teaching and Learning Strategies	

Strategy	.1 Self-direction strategy. 2. Collaborative learning strategy. .3 Role-playing strategy. .4 Discussion and dialogue strategy. .5 Lecture strategy. .6Brainstorming strategy.

10. Course structure

week	Hours	Required learning outcomes	Unit name/topic	Teaching method	Evaluation method
1	2	The student should be able to know the correct rules for writing the subject and predicate and be able to parse each of them correctly.	Subject and predicate	Theoretical	Classroom and homework assignments, weekly and monthly exams
2	2	The student should be able to distinguish between the verb, the subject, and the object, and should follow the correct rules in parsing each of them.	verb, subject and object	Theoretical	Classroom and homework assignments, weekly and monthly exams
3	2	The student should demonstrate a thorough understanding of transitive and intransitive verbs and discuss the difference between them.	Intransitive and transitive verbs	Theoretical	Classroom and homework assignments, weekly and monthly exams
4	2	To apply the correct rules in identifying and parsing pronouns and to be able to distinguish between separate, attached, prominent and hidden pronouns.	pronouns	Theoretical	Classroom and homework assignments, weekly and monthly exams
5	2	To adhere to the rules of diacritics and become familiar with the original and subsidiary diacritics.	Original and secondary diacritical marks	Theoretical	Classroom and homework assignments, weekly and monthly exams
6	2	To identify the five verbs wherever they appear and to apply the rules for writing them correctly according to the rules of the language.	The five verbs	Theoretical	Classroom and homework assignments, weekly and monthly exams
7	2	To learn the conjunctions in the language, memorize their meanings, and be familiar with the correct positions for these letters.	Conjunctions and their meanings	Theoretical	Classroom and homework assignments, weekly and monthly exams
8	2	The student must adhere to the rules for writing numbers	Number and counted	Theoretical	Classroom and homework

		and counted items.			assignments, weekly and monthly exams
9	2	The student should demonstrate a clear understanding of the hamzat al-wasl and hamzat al-qata' and be able to write the correct diacritics when they occur.	Hamzat al-Wasl and Hamzat al-Qat`	Theoretical	Classroom and homework assignments, weekly and monthly exams
10-11	2	The student should be familiar with the extra letters in the Arabic language, know the reasons for their use, and be able to formulate his writing without errors.	Extra letters	Theoretical	Classroom and homework assignments, weekly and monthly exams
12-13	2	The student should implement the correct rules for writing the letter "noon" and "tanween" and adhere to these rules and explain the rules of the letter "noon" and "tanween" himself.	Noon and Tanween	Theoretical	Classroom and homework assignments, weekly and monthly exams
14	2	The student should take into account the formal aspects of the administrative letter and memorize them correctly and be able to formulate a complete administrative letter free of linguistic errors.	Administrative speech	Theoretical	Classroom and homework assignments, weekly and monthly exams
15	2	The student should explore the common linguistic errors in society and be able to correct them and try to spread correct words in society.	Some common language mistakes	Theoretical	Classroom and homework assignments, weekly and monthly exams

11. Course Evaluation	
Grades are distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily oral tests, monthly or written tests, reports, etc	
Daily preparation	10
daily oral tests	20
monthly or written tests	50
Preparing reports	20

12 . Learning and teaching resources	
Required textbooks (curriculum books, if available)	Remember all the textbooks if any.

Main References (Sources)	The unified Arabic language curriculum taught in all departments of the Technical Institute / Mosul
Recommended books and references (scientific) journals, reports...	All language dictionaries, books and writings of linguists and grammarians.
Electronic references and websites	Sites that are interested in the Arabic language

Second Level / first Semester

Professional Ethics

1. Course Name: Professional Ethics	
2. Course Code: NTU204	
3. Semester / Year: Semester One / Second Year / Courses	
4. Description Preparation Date: 1/7/2025	
5. Available Attendance Forms: mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(2 theoretical) weekly * 15 weeks = 30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Mohammed Nazra Yousif Email: mohammednazar1983@ntu.edu.iq	
8. Course Objectives	
Course Objectives	1- Understanding the fundamentals of professional ethics and general principles. 2- Recognizing the differences between work behavior, profession, and craft. 3- Identifying methods and approaches for instilling professional ethical values and how to apply ethics in professional practice.
9. Teaching and Learning Strategies	
Strategy	1- Self-direction strategy. 2- Collaborative learning strategy. 3- Role-playing strategy. 4- Discussion and dialogue strategy. 5- Lecture strategy. 6- Research and discovery strategy. 7- Brainstorming strategy.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	To introduce the student to the concept of professional ethics and its importance in the work environment.	Introduction to Ethics and Its Importance in Human Life and Society – The Difference Between General Ethics and Professional Ethics.	theoretical	Classroom and homework assignments, weekly and monthly exams
2	2	To explain to the student the concept of professional ethics and the most important basic principles associated with it.	The concept of professional ethics - definition, objectives, and basic functions of professional ethics.	theoretical	Classroom and homework assignments, weekly and monthly exams
3	2	The student should list the professional rights and duties of the technician in the refrigeration and air conditioning sector.	The Importance of Professional Ethics in Technical Specialties – with a Focus on the Refrigeration and Air Conditioning Profession	theoretical	Classroom and homework assignments, weekly and monthly exams
4	2	The student will be able to predict future developments in the field of renewable energy in Iraq and the world.	Core professional values: honesty, integrity, responsibility, mastery, and discipline.)	theoretical	Classroom and homework assignments, weekly and monthly exams
5	2	The student must respect the intellectual property rights of others' designs or professional innovations.	Professional behavior in the workplace: adherence to regulations, cooperation, positive communication.	theoretical	Classroom and homework assignments, weekly and monthly exams
6	2	The student must participate in work teams, taking into	Ethics in dealing with	theoretical	Classroom and

		account the ethics of cooperation and interaction.	colleagues and clients - respect for opinions and privacy.		homework assignments, weekly and monthly exams
7	2	The student will acquire The student will acquire environmental awareness in using materials and gases in a way that does not harm the environment.	Use public and private resources and property in an ethical manner.	theoretical	Classroom and homework assignments, weekly and monthly exams
8	2	The student classifies the types of professional behaviors.	First semester exam (theoretical) + general review of the previous.	theoretical	Classroom and homework assignments, weekly and monthly exams
9	2	The student must demonstrate loyalty to the profession and the institution in which he works.	The technician's ethical responsibility is to carry out work accurately and safely, and to maintain occupational safety.	theoretical	Classroom and homework assignments, weekly and monthly exams
10	2	The student should have a high sense of ethical responsibility in all his professional practices.	Ethical challenges in business: corruption, bribery, forgery, negligence.	theoretical	Classroom and homework assignments, weekly and monthly exams
11	2	The student must adhere to professional confidentiality and protect customer data.	Ethics of maintaining the confidentiality of technical and commercial information of clients and companies.	theoretical	Classroom and homework assignments, weekly and monthly exams
12	2	The student must adhere to and apply the rules of occupational safety and ethical security during maintenance and installation.	Labor laws and legislation related to the profession (awareness summary).	theoretical	Classroom and homework assignments, weekly and monthly exams
13	2	That the student solves	Real or	theoretical	Classroom

		professional problems according to ethical values and not just technical ones.	hypothetical case studies of an ethical professional situation for analysis and discussion		and homework assignments, weekly and monthly exams
14	2	The student must have a desire to be a good role model for his colleagues through his professional conduct.	Work Ethics During Field Training and Practical Application – Positive Representation of the Educational Institution	theoretical	Classroom and homework assignments, weekly and monthly exams
15	5	The student will analyze the role of ethics in enhancing the quality of artistic and technical work.	Discussion and dialogue + theoretical exam.	theoretical	Discussion and dialogue + theoretical exam

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

Daily preparation	10
Daily oral exam	20
Monthly and written tests	40
Reporting	20
Classroom activity	10

12.Learning and Teaching Resources

Required textbooks (curricular books, if any	not available
Main references (sources)	1- Engineering Ethics: Concepts and Cases 2- Ethics and Professionalism Engineering 3- Business Ethics: Ethical Decision Making & Cases
Recommended books and references (scientific journals, reports...)	Business Ethics: Ethical Decision Makin & Cases
Electronic References, Websites	https://www.youtube.com/watch?v=Bva3 wWCTUA

Second Level / First Semester
Specialized Workshop

1. Course Title: Specialized Workshop	
2. Course Code MTI201	
3. Semester / Year: First Semester / Second Year / Courses	
4. Date of preparation of this description: 1/7/2025	
5. Available Forms of Attendance: Mandatory	
6. Number of Credit Hours (Total)	
(6 work) per week * 15 weeks = 90 hours	
7. Course administrator name (list all names, if more than one)	
8. Course Objectives (General Objectives of the Course)	
Course Objectives	1. Perform cutting, bending, and welding operations using professional techniques to ensure high-quality connections in compliance with industrial safety standards. 2. Form precise and reliable joints to ensure th integrity of the system and prevent leakage in various refrigeration systems. 3. Analyze and understand the operation of components in conventional and advanced vapor-compression refrigeration cycles, and interpret the interaction as an integrated system. 4. Connect and test mechanical and electrical refrigeration circuits in the laboratory using advanced diagnostic and verification methods. 5. Accurately use digital and analog measurin instruments, and interpret readings related to pressure, temperature, current, and voltage under various operating conditions. 6. Carry out refrigerant charging and recovery procedures for different refrigerant types using well-defined technical steps and applying proper

	control techniques for quantity and pressure. 7. Implement preventive and scheduled maintenance (PM) programs for early fault detection in refrigeration units and execute both basic ar advanced repair procedures. 8. Strictly adhere to occupational safety procedures when handling gases, electrical equipment, a welding tools in the workshop environment.

9. Teaching and Learning Strategies

Strategy	Experiential Learning Collaborative Learning Mini Projects Demonstration

10.Course structure

week	Hours	Required Learning Outcomes	Unit / Subject Name	Method of education	Evaluation method
1	6	1. To understand occupational safety instructions and procedures specific to refrigeration and air conditioning workshops. 2. To adhere to the implementation of safety measures while performing tasks within the	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		workshop. 3. To demonstrate professional discipline and accuracy during the execution of practical tasks in the workshop. 4. To collaborate effectively with colleagues as part of a team during maintenance and assembly operations. 5. To ensure proper use of tools and equipment while maintaining cleanliness and organization of the work environment.			
2	6	1. To identify the common types of pipes used in refrigeration and air conditioning systems	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models)

		(e.g., copper, steel, plastic). 2. To distinguish the properties of each type of pipe in terms of material characteristics such as corrosion resistance, weldability, and flexibility. 3. To understand the impact of pipe material on the performance of refrigeration and air conditioning systems in terms of efficiency and service life. 4. To determine the appropriate use for each type of pipe (e.g., supply lines, drainage pipes, high-pressure and low-pressure pipes). 5. To classify pipes based			3-Short tests 4-Weekly reports

		on manufacturing material and intended application within the system. 6. To apply skills in identifying and selecting the suitable pipe type during system design or maintenance. 7. To comply with technical standards and safety regulations when handling different types of pipes in the workplace.			
3	6	1. To identify the hand tools and equipment used for cutting, expanding, and bending pipes. 2. To understand the principles and methods of handling	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		metal pipes (such as copper or aluminum) during shaping. 3. To determine the appropriate angles for pipe bending according to design or connection requirements. 4. To accurately perform pipe cutting steps using manual or automatic cutting tools. 5. To execute pipe expansion according to specified measurements using suitable tools. 6. To carry out pipe bending at various angles while ensuring the material is not damaged or compromis			

		ed. 7. To adhere to occupational safety procedures when using cutting, bending, and expanding tools. 8. To demonstrate a high level of accuracy and efficiency during mechanical operations on pipes. 9. To verify the quality of shaped pipes and compare them with the required technical specifications.			
4	6	1. To identify the components and parts of the gas welding system (such as oxygen cylinder, acetylene cylinder, pressure regulator, torch,	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		hoses). 2. To understand the operating principles of the gas welding system and the ignition mechanism of the gas mixture used in welding. 3. To explain the function of each welding equipment component and its role in ensuring a proper and safe welding process. 4. To distinguish between types of flames produced (neutral flame, oxidizing flame, reducing flame) and the appropriate use of each in pipe welding. 5. To apply the basic rules for preparing and operating			

		gas welding equipment correctly and safely. 6. To identify factors affecting the quality of pipe welding such as temperature, gas type, and material nature. 7. To comply with occupational safety requirements specific to welding work to avoid hazards. 8. To assess the readiness of the welding system by inspecting equipment, hoses, and safety valves before starting work.			
5	6	1. To prepare the worksite and gas welding equipment according to	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making

		occupational safety standards. 2. To select the appropriate type and grade of filler material for copper pipe welding. 3. To properly prepare the pipe surface (cleaning, sanding, removing oils) before starting the welding process. 4. To adjust the torch flame according to the required welding type (usually a neutral flame). 5. To secure the pipes in a suitable position to ensure continuous and uniform welding. 6. To perform the welding process using the gas torch			models) 3-Short tests 4-Weekly reports

		with appropriate movements to ensure balanced heating and uniform distribution of the filler metal. 7. To monitor the required temperature to avoid pipe damage or welding failure. 8. To adhere to safety procedures during work, such as wearing protective glasses, gloves, and ensuring proper ventilation. 9. To evaluate the weld quality visually or by using non-destructive testing methods when possible. 10. To demonstrate high accuracy and skill in performing clean, safe, and			

		effective welding of copper pipes.			
6	6	1. To identify the main mechanical components in vapor compression refrigeration systems (compressor, condenser, expansion valve, evaporator). 2. To understand the operating mechanism of each mechanical component within the refrigeration cycle and its role in heat transfer and cooling the medium. 3. To recognize the auxiliary electrical components in household appliances (relay, thermostat, start	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		capacitor, electric motor, protective devices). 4. To explain the relationship between the mechanical circuit and the electrical circuit in operating the system as an integrated unit. 5. To distinguish between the systems used in various household appliances such as: 6. Refrigerator (simple thermal separation cooling system with automatic temperature control). 7. Freezer (cooling system with low cooling capacity to achieve subzero temperatures). 8. Water cooler			

		(cooling system with an internal tank and electrical circuit for level control). 9. To correlate household appliance faults with the roles of their mechanical and electrical components. 10. To use schematic diagrams to understand the arrangement and connection of components within the appliance. 11. To demonstrate an integrated understanding of how the system operates as a closed loop for heat transfer and temperature control.			

7	6	1. To identify the basic components of split air conditioning units (indoor unit – outdoor unit). 2. To recognize the main mechanical parts (compressor, condenser, evaporator, expansion valve, fans). 3. To identify the electrical components (electronic control board, thermostat, control devices, capacitor, sensors). 4. To understand the function of each mechanical component in the cooling process and heat transfer. 5. To understand the role of	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		each electrical component in controlling system operation and regulating thermal response. 6. To connect the mechanical and electrical circuits to understand the integrated system performance. 7. To distinguish between different electrical wire signals and colors used in connections. 8. To analyze potential causes of common faults based on understanding components and their functions. 9. To read and accurately interpret wiring diagrams.			

		10. To demonstrate practical understanding of task distribution between the indoor and outdoor units in a split system.			
8	6	1. To identify the basic diagrams of mechanical and electrical circuits in simple household refrigeration systems. 2. To understand the function of each component in the mechanical circuit (compressor, evaporator, condenser, expansion valve). 3. To recognize the basic electrical components such as relay, thermostat, capacitor,	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		start switch, and protective devices. 4. To determine the correct connection points between electrical components using technical schematics. 5. To use appropriate tools to connect wires and mechanical components safely and effectively. 6. To perform electrical and mechanical connections following the correct technical sequence. 7. To apply system trial operation procedures after completing the connections. 8. To observe performance indicators (cooling efficiency, operational stability, thermostat			

		response) after system start-up. 9. To adhere to electrical and mechanical safety standards during connection and operation. 10. To evaluate the effectiveness of the connections made and correct any potential errors to ensure efficient system operation.			
9	6	1. To identify common faults in refrigeration systems, such as gas leaks, blockages, reduced cooling, or compressor failure. 2. To understand early indicators signaling leaks or faults (e.g., pressure drop,	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		unusual noises, pipe freezing). 3. To determine the diagnostic tools and methods used in fault detection, including: 4. Bubble solution 5. Electronic leak detector 6. Manometer 7. Current and voltage meters 8. To apply standardized scientific methods to locate leaks (e.g., visual inspection, electronic detectors, pressure measurement). 9. To implement systematic procedures for inspecting mechanical and electrical components to identify faults. 10. To measure			

		operational variables (pressure, temperature, current) and compare them against standard values. 11. To analyze inspection results to determine the root cause of faults or leaks. 12. To document observations and inspection data using technical forms and reports. 13. To recommend appropriate repair or replacement actions based on diagnostic outcomes. 14. To comply with occupational safety procedures during inspection and diagnosis activities.			
10	6	1. To identify	Refrigerati	practical	1-

		types of moisture barriers and contaminants that must be removed during the evacuation process. 2. To understand the importance of evacuation in protecting the system from damage and enhancing operational efficiency. 3. To prepare the necessary tools and equipment for evacuation and charging (vacuum pump, pressure gauge, refrigerant cylinder, hoses, digital scale). 4. To correctly connect measuring devices and vacuum	on workshops, air conditioning and pipes		Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		pump to the system according to technical procedures. 5. To perform air and moisture evacuation from the system until the desired pressure is reached (typically below 500 microns). 6. To select the appropriate refrigerant type based on the equipment and specifications (e.g., R134a, R600a, R410A). 7. To accurately weigh the required refrigerant quantity using an electronic scale or digital charging device. 8. To inject refrigerant into the system in an organized manner (through			

		the suction or service line) and within the permissible pressure limits. 9. To monitor system stability after charging using the manometer and by measuring suction and discharge line temperatures. 10. To adhere to all safety procedures when handling high pressures and flammable gases (such as wearing gloves, protective goggles, and working in well-ventilated areas). 11. To verify the absence of leaks after charging through re-inspection.			
11	6	1. To watch educational	Refrigeration	practical	1- Attendance,

		videos related to refrigeration and air conditioning topics carefully and attentively. 2. To extract the key technical ideas and concepts presented in the videos, such as maintenance, connection, or inspection steps. 3. To identify the tools and equipment used in the educational videos and compare them with those available in the workshop. 4. To analyze the sequence of practical steps demonstrated in the videos and relate them to the approved standard procedures. 5. To take	workshops, air conditioning and pipes		discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		notes on important practices, including correct methods and common mistakes presented in the videos. 6. To connect the theoretical knowledge gained from the videos with the practical tasks required in the workshop. 7. To evaluate the degree of alignment or discrepancy between theoretical instruction and actual workplace conditions. 8. To apply the skills learned from the educational videos while performing practical exercises in the workshop. 9. To discuss			

		with colleagues and workshop supervisors the practical benefits of the videos and ways to improve performance based on them. 10. To demonstrate the ability to integrate digital learning methods with hands-on practice to achieve more accurate and skilled results.			
12	6	1. To understand the role of oil in refrigeration systems and its importance in lubricating moving components such as the compressor. 2. To identify the types of oils used in	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		refrigeration systems and the characteristics of each type. 3. To determine the appropriate oil quantity required according to system specifications and manufacturer instructions. 4. To prepare the tools and equipment necessary for adding oil safely and accurately. 5. To apply the steps for adding oil to the refrigeration system while considering operating and maintenance conditions. 6. To adhere to occupational safety procedures when handling oil and system			

		components. 7. To verify oil distribution within the system to ensure effective lubrication of all moving parts. 8. To monitor system performance after oil addition to ensure stability and absence of leaks or faults. 9. To document oil addition operations, including dates and quantities used, in the maintenance log.			
13	6	1. To identify the types of measuring instruments used in inspection and maintenance, such as manometers and thermometers, and understand the	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		function of each device. 2. To understand the operating principles of each instrument and accurately read measurement values. 3. To properly prepare the instruments before use, ensuring their functionality and calibration. 4. To apply correct connection and installation methods of measuring instruments on the refrigeration system. 5. To use the manometer to precisely measure operating pressures during inspection and maintenance stages. 6. To measure temperatures at			

		various points in the system using thermometers. 7. To accurately and systematically record measurements for system performance analysis. 8. To interpret readings and understand their implications for system condition and potential issues. 9. To adhere to safety procedures while handling instruments and systems under pressure or varying temperatures. 10. To maintain and care for measuring instruments to preserve their accuracy			

		and efficiency.			
14	6	1. To identify the types of air ducts used in air conditioning systems and the characteristics of different sheet metal materials. 2. To understand the steps involved in designing and preparing air ducts to meet ventilation and air conditioning requirements. 3. To determine the tools and equipment necessary for cutting, shaping, welding, and assembling air ducts and sheet metal. 4. To apply accurate sheet metal cutting techniques according	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4-Weekly reports

		to required dimensions for manufacturing air ducts and condensate drainage pipes. 5. To perform sheet metal forming and bending operations to create ducts and channels in various shapes and angles. 6. To join air duct components using appropriate methods such as welding, bolting, or spot welding. 7. To fabricate condensate drainage pipes with proper slope to prevent water accumulation. 8. To adhere to occupational safety standards during manufacturing and			

		installation processes. 9. To monitor manufacturing quality in terms of accuracy, strength, and installation integrity. 10. To securely install air ducts and drainage pipes at their final locations within the air conditioning system correctly and safely.			
15	6	1. To prepare for the field visit by reviewing the basics and components of refrigeration and air conditioning equipment in advance. 2. To identify during the visit the various types and models of	Refrigeration workshops, air conditioning and pipes	practical	1- Attendance, discipline and active participation 2- Practical tests (making models) 3-Short tests 4- Weekly reports

		refrigeration and air conditioning equipment used in industrial and residential settings. 3. To observe the installation and operation of equipment and different system components. 4. To determine the primary functions of each component within the refrigeration and air conditioning system observed. 5. To collect practical information related to equipment maintenance and operation through interaction with accompan			

		ying technicians or engineers. 6. To describe the inspection and maintenance procedures and techniques witnessed during the visit. 7. To record observations and any questions to discuss later with supervisors or peers. 8. To correlate previously studied theoretical knowledge with what was observed during the field visit. 9. To prepare a concise report highlighting key learnings and emphasizing the strengths and challenges of the equipment			

		encountered. 10. To demonstrate professional behavior during the visit, such as adherence to instructions, safety protocols, and constructive engagement.			

11. Course Evaluation	
Distribution of grades out of 100 according to the tasks assigned to the student such as daily preparation, daily oral tests, monthly or written tests, reports... Etcetera.	
Daily preparation	10%
Practical Reports	10%
Monthly test	30%
Reporting	10%
Practical activity	40%

12. Learning and Teaching Resources	
Required textbooks (curriculum books, if applicable)	Mandatory maintenance and operation of units
Main references (sources)	Principles of refrigeration, air conditioning and refrigeration

	engineering (Khaled Ahmed Al-Judi) Refrigeration and air conditioning devices (Sabri Boulos) Modern practical aspects in refrigeration and air conditioning (Sabri Boulos)
Recommended books and references (scientific journals, reports...)	Write the name of the recommended reference for each course Principles of Refrigeration (Narrated J. Dosat)
Websites & References	Remember the websites (such as the department's YouTube channel or any link that can be used according to the specialization

Course Description Form

First level / first course

1. Course Name:
Principles of Medical Rehabilitation Methods
2. Course Code:
3. Semester / Year:
the first\ 2025-2026
4. Description Preparation Date:
2025
5. Available Attendance Forms:
1 - Weekly Course Schedule (Theoretical) 2 - Laboratory (Practical) 3 - Discussions, Scientific Seminars, and Other Extracurricular Activities (Fi Visits)
6. Number of Credit Hours (Total) / Number of Units (Total)
4 × 15 weeks = 60 / 4 units (2 theoretical + 2 practical)
7. Course administrator's name (mention all, if more than one name)
Name: Tamara Khaled Ahmed Email:tamarakhaled32@ntu.edu.iq
8. Course Objectives

Course Objectives MainObjective:Linking the Prosthetic/Orthotic Profession w Human Function	1. Cognitive Objectives (Theoretical) • Understanding the fundamental principles of med rehabilitation and its importance in restoring m functions • Identifying types of physical disabilities and t impact on the patient's life • Studying the functional anatomy of musculoskeletal and nervous systems • Learning the stages of the medical rehabilita process from assessment to follow-up • Understanding the role of prosthetics and assis devices in rehabilitation programs 2. Skill-Based Objectives (Applied/Practical) • Ability to assess the patient's rehabilitation needs • Designing appropriate rehabilitation programs prosthetic and orthotic device users • Mastering functional measurement and assessm techniques • Training on the use of various rehabilita

	equipment • Applying specific physical therapy exercises amputees and patients with disabilities 3. Professional Objectives • Preparing a prosthetist and orthotist capable working within the rehabilitation team • Developing communication skills with patients their families • Ability to document cases and monitor pat progress

9. Teaching and Learning Strategies

Strategy	(Theoretical Lectures / Listening Lectures / Discussion Lecture Interactive Lectures / Library and Internet Research on Speci Topics)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types rehabilitation.	UnitOne: Introduction Medical Rehabilitatior	Lecture, discussion, Q&A (questions a answers), viewing educational videos a films, practi training.	Exam Homework assignment Reports a research Participation and attendanc
2	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types rehabilitation.	UnitTwo: Functional Anatomy Related Rehabilitatior	Lecture, discussion, Q&A (questions a answers), viewing educational videos a films, practi training.	Exam Homework assignment Reports a research Participation and attendanc
3	2Theory + 2 Practic	The concept medical rehabilitation, main objectives,and	UnitThree: Types Disabilities a Their Causes	Lecture, discussion, Q&A (questions	Exam Homework assignment Reports a research

		types rehabilitation.		and answers), viewing educationa l videos and films, practical training.	Participation and attendanc
4	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types rehabilitation.	UnitFour: Stages of Medical Rehabilitatior Process	Lecture, discussion, Q&A (questions a answers), viewing educational videos a films, practi training.	Exam Homework assignment Reports a research Participation and attendanc
5	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types rehabilitation.	UnitFive: Physical Therapy Methods	Lecture, discussion, Q&A (questions a answers), viewing educational videos a films, practi training.	Exam Homework assignment Reports a research Participation and attendanc
6	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types rehabilitation.	UnitSix: Rehabilitatior r Amputees.	Lecture, discussion, Q&A (questions a answers), viewing educational videos a films, practi training.	Exam Homework assignment Reports a research Participation and attendanc
7	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types	UnitSeven: Rehabilitatior Using Orthc Devices.	Lecture, discussion, Q&A (questions a answers), viewing	Exam Homework assignment Reports a research Participation

		rehabilitation.		educational videos a films, practi training.	and attendanc
8	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types rehabilitation.	UnitEight: Rehabilitatior forSpecial Cases.	Lecture, discussion, Q&A (questions a answers), viewing educational videos a films, practi training.	Exam Homework assignment Reports a research Participation and attendanc
9	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types rehabilitation.	UnitNine: Assessment a Measurement Rehabilitatior	Lecture, discussion, Q&A (questions a answers), viewing educational videos a films, practi training.	Exam Homework assignment Reports a research Participation and attendanc
10	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types rehabilitation.	UnitTen: Psychologica andSocial Aspects	Lecture, discussion, Q&A (questions a answers), viewing educational videos a films, practi training.	Exam Homework assignment Reports a research Participation and attendanc
11	2Theory + 2 Practical	The concept medical rehabilitation, main objectives,and types rehabilitation.	UnitEleven: Complicatior ofNon-Rehabilitatior	Lecture, discussion, Q&A (questions a answers), viewing educational videos a films, practi	Exam Homework assignment Reports a research Participation and attendanc

				training.	

11.Course Evaluation

Total: 100 marks / Passing grade: 50 marks

Grade distribution is as follows:

- 20 marks - Monthly examination
- 10 marks - Student assignments such as daily preparation, daily oral tests, and participation
- 10 marks - Student evaluation based on attendance, interaction, and participation in extracurricular activities
- 10 marks - Practical laboratory performance assessment (execution of results, reports, attendance)
- 10 marks - Final practical examination
- 40 marks - Final theoretical examination

 40 marks - Final theoretical examination

12.Learning and Teaching Resources

General Medical Rehabilitation Books	Physical Rehabilitation
Braddom's Physical Medicine and Rehabilitation	Atlas of Limb Prosthetics: Surgic Prosthetic, and Rehabilitati Principles
Orthotics and Prosthetics in Rehabilitation	Braddom's Physical Medicine a Rehabilitation
American Academy of Orthotists and Prostheti (AAOP	Össur Academy
Physical Therapy Journal	Physiotutors
Pathological and Prosthetic Gait	Introduction to Prosthetics a Orthotics
Journal of Prosthetics and Orthotics (JPO	Ottobock