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

Academic Program and Course Description Guide Department of Computer Engineering Technology

2025

The Introduction:

The educational program is a coordinated and organized package of courses that include procedures and experiences organized in the form of study vocabulary, the main purpose of which is to build and refine the skills of graduates, making them qualified to meet the requirements of the labor market. It is reviewed and evaluated annually through internal or external audit procedures and programs such as the external examiner program.

The academic program description provides a brief summary of the main features of the program and its courses, indicating the skills that are being worked on to acquire for students based on the objectives of the academic program. The importance of this description is evident as it represents the cornerstone in obtaining program accreditation and is written by teaching staff under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments and changes in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, semester) system, in addition to adopting the description of the academic program circulated under the letter of the Department of Studies TM3/2906 dated 5/3/2023 regarding programs that adopt the Bologna path as a basis for their work .

In this regard, we cannot but emphasize the importance of writing a description of academic programs and courses to ensure the smooth running of the educational process.

Concepts and terms:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected from the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture of the future of the academic program to be an advanced, inspiring, motivating, realistic and applicable program.

Program Mission: Clarifies the goals and activities necessary to achieve them in a concise manner, and identifies the program's development paths and directions.

Program Objectives: These are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (semester, annual, Bologna track) whether they are required (ministry, university, college and scientific department) with the number of academic units.

Learning outcomes: A consistent set of knowledge, skills and values acquired by the student after successfully completing the academic program. The learning outcomes for each course must be specified in a way that achieves the program objectives.

Teaching and learning strategies: These are the strategies used by the faculty member to develop the student's teaching and learning. They are plans that are followed to achieve the learning objectives. That is, they describe all the classroom and extracurricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University: **Northern Technical University**

College: **Technical Engineering College of Kirkuk**

Scientific Department: **Computer Engineering Department**

Final Certificate Name: .....

Academic System: .....

Description Preparation Date:

File Completion Date: **1/10/2024**

Name of the Head of Department:

Signature:

Dean's Name
Dr. Sami R Aslan
Date: **1 / 10 /2024**

Dean's Assistant for
Dr. Muntadher.A.Shareef
Date: **1/ 10 /2024**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Dr. Rana Hilmi Abduljabbar

Date: **1 / 2 /2025**

Signature

1. Program vision

The department aims to be a pioneer in the field of computer engineering and information technology by preparing competent engineers, supporting scientific research, providing technical advice in the field of specialization, and working to serve the community.

2. Program message

Preparing competent engineers capable of meeting the needs of the labor market (government institutions and the private sector) in the field of computer engineering technologies by providing consultation, design and implementation in the specialization of computer engineering technologies and information technology.

3. Goals

- Graduating engineering cadres with a high level of understanding, knowledge and psychological preparation capable of building, analyzing and developing computer systems, with follow-up of these cadres after graduation.
- Organizing seminars, holding scientific conferences and workshops with other colleges, government institutions and the private sector, and providing academic consultations in the fields of computer engineering to solve problems and develop the work of these institutions.
- Continuous updating of curricula to keep pace with scientific developments in a manner that suits the needs of the labor market by providing an appropriate environment for theoretical and practical teaching using the latest means and devices and adopting quality standards and academic accreditation.
- Providing academic consultations in the fields of computer engineering.
- Raising the scientific and technological level by adopting the correct method in the field of scientific research and building a solid research base.
- Adopting global quality standards and academic accreditation.

4. Program accreditation

The program has not received software accreditation yet.

5. Other external influences

Nothing

6. Program Structure

Program Structure	Number of Courses	Study unit	Percentage	Notes *
Institutional Requirements(university)	8	24		Core Course, Elective Course
College Requirements	12	36		Core Course, Elective Course
Department Requirements	51	199		Core Course, Elective Course
Summer Training	There is			Core
Other	nothing			

* Notes may include whether the course is basic or optional.

7. Program Description

Academic year	Course code	Subject	Credit hours			the total	Number of units
			th	pr	tu		
2024-2025 / Level 1 – First Course (Bologna)	TECK102	Engineering Drawing	-	3	-	3	5
	TECK101	Calculus	4	-	2	6	6
	COE113	Electrical Engineering Foundations	4	4	-	8	8
	COE114	Computer Programming	4	4	-	8	7
	NTU 100	Human Rights and Democracy	2	-	-	2	2
	NTU 101	English Language	2	-	-	2	2
the total			16	11	2	29	30

Academic year	Course code	Subject	Credit hours			the total	Number of units
			th	pr	tu		
2024-2025 / Level 1 - Course 2 (Bologna)	COE124	Electrical Circuits	4	4	-	8	6
	COE125	Digital Logic	4	4	-	8	5
	COE123	Computer organization	2	2	-	4	5
	NTU 102	Computer Applications	2	2	-	4	3
	NTU 103	Arabic Language	2	-	-	2	2
	TECK103	Workshops	-	3	-	3	4
	TECK104	Physics	2	-	-	2	5
the total			16	15	-	31	30

Academic year	Course code	Subject	Credit hours			Number of units
			th	pr	total	
2024-2025 / Level 2 – First Course (Courses)	COE207	Communications Fundamentals 1	2	2	4	3
	COE201	Microprocessor Architecture 1	2	2	4	3
	COE209	Operating Systems 2	2	2	4	3
	COE203	Computer Programming 2	1	2	3	2
	COE205	Electronics 1	2	2	4	3
	COE204	Measurements and Sensors 3	2	2	4	3
	TECK201	Mathematics 3	3	-	3	3
	NTU200	English Language 2	2	-	2	2
	NTU202	Baath Party Crimes	2	-	2	2
the total			18	12	30	24

	Course code	Subject	Credit hours			Number of units
			th	pr	total	
2024-2025 / Level 2 – Course1 (Bologna)	COE212	Computer Architecture	2	2	4	3
	COE224	Databases	2	2	4	3
	COE211	Object Oriented Programming	1	2	3	2
	COE213	Measurements and Sensors	2	2	4	3
	NTU200	Baath Regime Crimes in Iraq	2	-	2	2
	TECK200	Differential Equations	3	-	3	4
	TECK204	Summer Training	-	-	-	-
the total			18	12	30	17

	Course code	Subject	Credit hours			Number of units
			th	pr	total	
2024-2025 / Level 2 – Course2 (Bologna)	NTU201	English Language	2	0	2	2
	COE224	Arabic Language	2	0	2	2
	COE225	Microprocessors	2	2	4	6
	COE221	Electronics	2	2	4	4
	NTU200	Computer	2	2	4	3
	TECK200	Differential Equations	3	-	3	4
	COE222	Communications Fundamentals	2	2	4	4
	COE224	Databases	2	2	4	4
	TECK204	Summer Training	-	-	-	-
the total			18	12	30	17

Academic year	Course code	Subject	Credit hours			Number of units
			th	pr	total	
2024-2025 / Level Three - Computer Networks and Communications Branch - First Course	COE307	Computer Networks1	2	2	4	3
	TECK300	Engineering Analysis	2	2	4	3
	COE301	Fundamentals of Control Engineering1	2	2	4	3
	COE304	Design of Real-Time Systems	2	2	4	3
	COE309	Digital Controllers1	2	2	4	3
	COE306	Digital Signal Processing	2	2	4	3
	NTU300	English3	2	-	2	2
the total			14	12	26	20

Academic year	Course code	Subject	Credit hours			Number of units
			th	pr	total	
2024-2025 / Level Three - Computer Electronics Branch - First Course	TECK300	Engineering Analysis	2	2	4	3
	COE301	Fundamentals of Control Engineering1	2	2	4	3
	COE305	Power Electronics1	2	2	4	3
	COE304	Design of Real-Time Systems	2	2	4	3
	COE309	Digital Controllers1	2	2	4	3
	COE306	Digital Signal Processing	2	2	4	3
	NTU300	English3	2	-	2	2
the total			14	12	26	20

Academic year	Course code	Subject	Credit hours			Number of units
			th	pr	total	
2024-2025 / Level Three - Computer Networks and Communications Branch - Second Course	COE312	Computer Networks 2	2	2	4	3
	TECK301	Numerical Analysis	2	2	4	3
	COE302	Fundamentals of Control Engineering 2	2	2	4	3
	COE306	Computer Network Simulators	1	2	3	2
	COE307	Cyber Security	2	2	4	3
	COE308	Digital Controllers 2	2	2	4	3
	COE305	Digital Communications	2	2	4	3
	TECK302	Summer Training	-	-	-	-
the total			13	14	27	20

Academic year	Course code	Subject	Credit hours			Number of units
			th	pr	total	
2024-2025 / Level Three - Computer Electronics Branch - Second Course		Electronic Systems Simulators	1	2	3	2
	TECK301	Numerical Analysis	2	2	4	3
	COE302	Fundamentals of Control Engineering 2	2	2	4	3
	COE304	Power Electronics 2	2	2	4	3
	COE300	Internet of Things	2	2	4	3
	COE308	Digital Controllers 2	2	2	4	3
	COE305	Digital Communications	2	2	4	3
	TECK302	Summer Training	-	-	-	-
the total			13	14	27	20

Academic year	Course code	Subject	Credit hours			Number of units
			th	pr	total	
2024-2025 / Fourth Phase - Computer Networks and Communications & Computer Electronics Branchs (First course)	COE401	Intelligent systems modeling	2	2	4	3
	COE419	Research Methodology	2	2	4	2
	COE402	Multimedia computing	2	2	4	3
	COE404	Computer networking protocols	2	2	4	3
	COE406	Computer and network security	2	2	4	3
	COE410	Advanced digital electronics	2	2	4	3
	COE409	English language4	2	-	2	2
the total			18	16	26	19

Academic year	Course code	Subject	Credit hours			Number of units
			th	pr	total	
2024-2025 / Fourth Phase - Computer Networks and Communications & Computer Electronics Branchs (Second course)	COE403	Economic Engineering	2	0	2	2
	COE407	project management	2	2	4	3
	COE408	Mobile communications systems	2	2	4	3
	COE411	Information theory and coding	2	2	4	3
	COE414	Advanced computer technology	2	2	4	3
	COE412	Computer adapter circuits	2	2	4	3
	COE405	Artificial intelligence	2	2	4	3
	COE408	Graduation Project	-	3	3	2
the total			14	15	33	22

8. Expected learning outcomes of the program

Knowledge	
Education outcomes 1 1. Ability to apply knowledge in mathematics and computer science. 2. Ability to design technical systems, components, a process that is both theoretical and practical to meet the required needs within the specialized field within a realistic framework that imposes environmental, economic, social, political, and health constraints. 3. Teaching leadership skills and the value of commitment, quality, ethical behavior, and respect for others.	Statement of education outcomes 1
Skills	
Education outcomes 2 1. Ability to design and conduct experiments. 2. Ability to implement and maintain systems. 3. Ability to design using design and simulation software. 4. Ability to use modern technical methods, tools, and skills necessary for technical work.	Statement of education outcomes 2
Education outcomes 3 1. Brainstorming 2. Problem-solving skills 3. Deductive reasoning	Statement of education outcomes 3
Ethics	
Education outcomes 4 1. Ability to work within a team. 2. Effective communication skills. 3. Ability to adapt to related specialties (Computer Engineering Techniques). 4. Effective impact on society and the job market through training and development programs related to the specialty at different levels.	Statement of education outcomes 4

9. Teaching and Learning Strategies

Teaching and learning strategies aim to ensure understanding of lectures and engaging students in learning. This is achieved through: -

1. Explaining the scientific material to students in detail.
2. Involving students in solving mathematical problems.
3. Discussion and dialogue about vocabulary related to the topic.
4. Writing programs and algorithms for problems in different topics.
5. Brainstorming strategy.
6. - Group work strategy.
7. Learning strategy by identifying models and previous experiences.
8. Discussion and exchange strategy.
9. Self-learning strategy

10- Evaluation methods

Daily class exams, questions for groups of students, reports, monthly and semester exams and a final exam. In the practical part of the semester, the evaluation of the laboratory grade depends on the experiments and reports, and in the graduation stage there is an evaluation of the final year project.

11- Faculty

Faculty Members						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Computer Science	Image Processing			1	
Assistant Professor	Computer science	Information technology			3	
Assistant Professor	Math	Math			1	
Assistant Professor	Plant Sciences	Plant Sciences			1	
Teacher	Computer Engineering	Computer			3	

assistant teacher	Control and system engineering	Computer engineering			3	
assistant teacher	Computer Engineering	Computer engineering			10	
Assistant Teacher	General Math	Math			1	
Assistant Teacher	Arabic	Arabic				1

12. Professional Development

Mentoring new faculty members

1. Introducing new faculty staff to the university's vision (environments), mission, organizational structure, policies, and procedures.
2. Empowering new faculty staff to gain a better understanding of their rights and responsibilities.
3. Providing new faculty staff with detailed information about university facilities and services.

Professional development of faculty members

Professional development for faculty members is essential for academic excellence. There is a need for effective development opportunities to achieve academic advancement, which can be accomplished through participation in the following scientific activities: Workshops Seminars lectures, Scientific research, summer courses community, community activities

Conferences

13- Acceptance Criterion

The admission mechanism depends on the procedures of the Ministry of Higher Education and Scientific Research and its directives at the beginning of each year and regarding the academic year 2023-2024. The following mechanism was adopted: A- Graduates of the preparatory stage, scientific branch - - Scientific average 65 B- Graduates of the industrial preparatory school: Computer maintenance, electricity and electronics branch Scientific average 70

14- The most important sources of information about the program

Department, College and University Documents and Guide
Department website within the university website

15- Program Development Plan

1- Using educational techniques by applying comprehensive quality management in education and relying on Association of Arab Universities (AAU).

2- Activating educational platforms that keep pace with technological development.

3- Connecting the educational institution to the surrounding environment, qualifying its graduates according to the requirements of the internal and external labor market, and giving these graduates the ability to plan and implement small projects.

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	
	Engineering Drawing	TECK102	Secondary	*	*	*	*	*	*	*	*	*	*	*		
	Calculus	TECK101	Secondary	*	*	*	*	*	*	*	*	*	*	*		
	Electrical Engineering Foundations	COE113	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Computer Programming	COE114	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Human Rights and Democracy	NTU 100	Interpolation	*	*	*	*	*	*	*	*	*	*	*		
	English Language	NTU 101	Interpolation	*	*	*	*	*	*	*	*	*	*	*		
	Electrical Circuits	COE124	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Digital Logic	COE125	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Computer organization	COE123	Specialized	*	*	*	*	*	*	*	*	*	*	*		

	Computer Applications	NTU 102	Interpolation	*	*	*	*	*	*	*	*	*	*	*		
	Arabic Language	NTU 103	Interpolation	*	*	*	*	*	*	*	*	*	*	*		
	Workshops	TECK103	Secondary	*	*	*	*	*	*	*	*	*	*	*		
	Physics	TECK104	Secondary	*	*	*	*	*	*	*	*	*	*	*		
	Computer Architecture	COE212	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Databases	COE224	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Object Oriented Programming	COE211	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Measurements and Sensors	COE213	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Baath Regime Crimes in Iraq	NTU200	Interpolation	*	*	*	*	*	*	*	*	*	*	*		
	Differential Equations	TECK200	Secondary	*	*	*	*	*	*	*	*	*	*	*		
	Summer Training	TECK204	Secondary	*	*	*	*	*	*	*	*	*	*	*		
	English Language	NTU201	Interpolation	*	*	*	*	*	*	*	*	*	*	*		
	Arabic Language	COE224	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Microprocessors	COE225	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Electronics	COE221	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Computer	NTU200	Interpolation	*	*	*	*	*	*	*	*	*	*	*		
	Differential Equations	TECK200	Secondary	*	*	*	*	*	*	*	*	*	*	*		
	Computer Networks1	COE307	Specialized	*	*	*	*	*	*	*	*	*	*	*		

	Engineering Analysis	TECK300	Secondary	*	*	*	*	*	*	*	*	*	*	*		
	Fundamentals of Control Engineering1	COE301	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Design of Real-Time Systems	COE304	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Digital Controllers1	COE309	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Digital Signal Processing	COE306	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	English3	NTU300	Interpolation	*	*	*	*	*	*	*	*	*	*	*		

	Computer Networks 2	COE312	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Numerical Analysis	TECK301	Secondary	*	*	*	*	*	*	*	*	*	*	*		
	Fundamentals of Control Engineering 2	COE302	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Computer Network Simulators	COE306	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Cyber Security	COE307	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Digital Controllers 2	COE308	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Digital Communications	COE305	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Engineering Analysis	TECK300	Secondary	*	*	*	*	*	*	*	*	*	*	*		

	Fundamentals of Control Engineering1	COE301	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Power Electronics1	COE305	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Design of Real-Time Systems	COE304	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Digital Controllers1	COE309	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Digital Signal Processing	COE306	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	English3	NTU300	Interpolation	*	*	*	*	*	*	*	*	*	*	*		
	Intelligent systems modeling	COE401	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Research Methodology	COE419	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Multimedia computing	COE402	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Computer networking protocols	COE404	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Computer and network security	COE406	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Advanced digital electronics	COE410	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	English language4	COE409	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Economic Engineering	COE403	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	project management	COE407	Specialized	*	*	*	*	*	*	*	*	*	*	*		

	Mobile communications systems	COE408	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Information theory and coding	COE411	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Advanced computer technology	COE414	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Computer adapter circuits	COE412	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Artificial intelligence	COE405	Specialized	*	*	*	*	*	*	*	*	*	*	*		
	Graduation Project	COE408	Specialized	*	*	*	*	*	*	*	*	*	*	*		

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

Description of first level courses

1. Course Name:
undations of Electrical Engineering
2. Course Code:
)E113
3. Semester / Year:
MESTER
4. Description Preparation Date:
25/06/21
5. Available Attendance Forms:
25/06/21
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
me: Dr. Ali Mardan Hameed ıail: ali.qutub@ntu.edu.iq
8. Course Objectives

ırse Objectives	• **1. Communicate with the Eng language to students** • **2. Introduce students to electrical bas** • **3. Introduce students to correct read and writing and how to connect electrical circ**

9. Teaching and Learning Strategies	
ıtegy	Course Outcomes finition: A set of knowledge, skills, and values that a course seeks to achieve in students. portance: It provides the learner with a clear idea of what they will able to do after completing the course, and it helps in designing and evaluating courses. w They Are Determined: Course outcomes are determined based the objectives of the academic program to which the course belongs.

10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	4	asics of electricity	Basics of electricity dc	theoretical	Daily oral and written test
	4	Ohm and kvl law	hm and kvl law dc	theoretical	Daily oral and written test
	4	Series and Parallel connect	Series and Parallel connect dc	Theoretical	Daily oral and written test
	4	Nodel law	Nodel law dc	Theoretical	Daily oral and written test
	4	Mesh law	Nodel law dc	Theoretical	Daily oral and written test
	4	Thevenin law	Thevenin Law dc	Theoretical	Daily oral and written test
	4	Norton law	Norton law dc	Theoretical	Daily oral

					and written test
	4	Power calculate	Power calculate dc	Theoretical	Daily oral and written test
	4	Volt calculate	Volt Calculate Dc	Theoretical	Daily oral and written test
	4	Ampere calculate	Ampere Calculate dc	Theoretical	Daily oral and written test
	4	Resistor calculate	Resistor Calculate dc	Theoretical	Daily oral and written test
	4	Angle inverse	Angle Inverse dc	Theoretical	Daily oral and written test
	4	verse volt and amp.	Inverse Volt and amp. dc	Theoretical	Daily oral and written test
	4	Delta to Y	Delta to Y dc	theoretical	Daily oral and written test
	4	1. St semester			written test

		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

12. Learning and Teaching Resources	
quired textbooks (curricular books, if any)	
in references (sources)	**FUNDAMENTALS OF ELECTRIC CIRCUITS**
Recommended books and references (scientific journals, reports…)	**INTRODUCTORY CIRCUIT ANALYSIS**
ctronic References, Websites	

1. Course Name: Computer Organization
2. Course Code: COE123
3. Semester / Year: 2024-2025
4. Description Preparation Date:1/7/2025
5. Available Attendance Forms: In-person
6. Number of Credit Hours (Total) / Number of Units (Total): 64 hours /5 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr.Ann Zeki Ablahd Email: drann@ntu.edu.iq Name: Gona Mohammed Dhahir Email: gonamohammed201@ntu.edu.iq Name: Ebtihal Sabah Majeed Email: ebtehal.sabah23@ntu.edu.iq

8. Course Objectives

Course Objectives	Giving the student information about the basic cepts of installing computers, their nponents and peripheral devices. Proficiency in the use and maintenance of nputers. Design and installation of the main memory of computer and its programming

9. Teaching and Learning Strategies

Strategy	teaching methods will include theoretical lectures, Practical lectures, homework and ctical application in the laboratory.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	ntify the basic nponents of a nputer system and lain their functions l interactions. erentiate between nputer organization and architecture.	oduction to nputer systems in parts of computer tem, organization l architecture.	ture and ctical	ly written quiz
2	4	scribe the Von umann architecture l explain its role in dern computer systems.	n Neumann hitecture.	ture and ctical	ly written quiz
3	4	fine and explain the ction of key digital nponents including isters, buffers,	oduction to the main tal component egisters , buffers , coder encoder)	ture and ctical	ly written quiz

		coders, and encoders.			
4	4	derstand the mory hierarchy and scribe the aracteristics and ctions of each mory level (registers, he, RAM, and secondary storage).	mory hierarchy ernal registers, che memory, mary memory, condary memory)	cture and ctical	ly written quiz
5	4	plain the purpose d types of system ses (data, address, ntrol) and how they cilitate mmunication tween components.	stem buses	cture and ctical	ly written quiz
6	4	scribe different emory addressing chniques and their plication in data rieval and storage.	emory addressing	cture and ctical	ly written quiz
7	4	strate the internal ganization of the PU and describe the nction of each unit LU, CU, registers).	PU basic ganization.		term exam
8	4	derstand the ganization and echanisms of put/output systems d how data is nsferred between	put & Output ganization.	cture and ctical	ly written quiz

		ripherals and emory.			
9	4	plain the concept of achine language and role in software–rdware interaction.	mputer s/w achine language).	cture and ctical	ly written quiz
10	4	efine what a croprocessor is and plain its ndamental erations and portance in mputing systems.	sic concept idea of croprocessor.	cture and ctical	ly written quiz
11	4	entify the chitectural structure the 8085 croprocessor and scribe its functional ocks.	roduction to 8085 architecture.	cture and ctical	ly written quiz
12	4	ecognize and explain e purpose of each in the 8085 croprocessor.	85 pin configuration	cture and ctical	ly written quiz
13	4	Define various addressing modes in the 8085 and demonstrate their application in instruction execution.	85addressing ode.	cture and ctical	ly written quiz
14	4	plain the concept of e stack and	ack memory and broutine.	cture and ctical	ly written quiz

		broutines and their age in program ntrol flow.			
15	4	derstand and mpare different leo color models g., RGB, CMYK, JV) and their plications.	deo Color Models	cture and ctical	ly written quiz
16	4	view all course ics and demonstrate diness for final essment through ision activities and cussions.	paratory week ore the final Exam		al exam

11. Course Evaluation

Weight (Marks)		Time/Number
10% (10)	2	Quizzes
10% (10)	2	Assignments
10% (10)	1	Projects / Lab.
10% (10)	1	Report
10% (10)	2hr	Midterm Exam
50% (50)	2hr	Final Exam
100% (100 Marks)		Total assessment

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	mputer organization: 5th (fifth) edition by Carl Hamacher, Zvonko G. Vranesic
Recommended books and references (scientific journals, reports...)	mputer organization and architecture: design performance (8th edition) by William stalling
Electronic References, Websites	https://www.coursera.org/browse/physical-ence-and-engineering/electrical-engineering

Course Description Form

1. Course Name: Differentiation and Integration
2. Course Code: TECK101
3. Semester / Year: Bologna
4. Description Preparation Date: 2025/06/21
5. Available Attendance Forms: Weekly / Theoretical and practical
6. Number of Credit Hours (Total) / Number of Units (Total) :
7. Course administrator's name (mention all, if more than one name)
Name: Email:

8. Course Objectives	
Course Objectives	• **Learn the vocabulary of the language of mathematics, including symbols, terms, shapes, and diagrams.** • **Learn about mathematical structures, especially numerical, algebraic, and geometric systems.** • **Learn about the nature of mathematics as an integrated sys of knowledge and its role in explaining certain natural phenomena.**

9. Teaching and Learning Strategies	
Strategy	**ching methods: Lectures, class discussions, and homework. Lecture notes and announcements will be posted on an appropriate communication platform.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

Week 1	2 theoretical	The student understands the subject	Matrices, Determinants & Grammar's Rule	theoretical	quiz
Week 2	2 theoretical	The student understands the subject	Scalars + Vectors, Component of Vector, Vector Algebra, Dot Product	theoretical	quiz
Week 3	2 theoretical	The student understands the subject	Orthogonal Vectors, Cross Product, Vector Calculus	theoretical	quiz
Week 4	2 theoretical	The student understands the ıbject The student understands the subject	Limits, Theory of Derivative & Chain Rule.	theoretical	quiz
Week 5	2 theoretical	The student understands the subject	Derivative of Trigonometric Function	theoretical	quiz
Week 6	2 theoretical	The student understands the subject	Inverse Trigonometric Functions. Exponential Function Derivative Inverse Trigonometric Functions.	theoretical	quiz
Week 7	2 theoretical	The student understands the subject	Derivative of Logarithmic Function, Applications.	theoretical	quiz
Week 8	2 theoretical	The student understands the ıbject The student understands the subject	Theory of Integration (Area Problems). The Definite + Indefinite Integrals	theoretical	quiz
Week 9	2 theoretical		Integral of Trigonometric Functions. Integral	theoretical	quiz

		The student understands the subject	of Inverse Trigonometric Functions.		
Week 10	heoretical	e student derstands the ject	Integration by Parts. Integral of Trigonometric Substitution	theoretical	quiz
Week 11	heoretical	e student derstands the ject	Partial Fractions The Substitution $z = tan\frac{x}{2}$	theoretical	quiz
Week 12	heoretical	e student derstands the ject	Volume of Revolution	theoretical	quiz
Week 13	heoretical	e student derstands the ject	Length of Curves	theoretical	quiz
Week 14	heoretical	e student derstands the ject	Application of Derivatives L'Hospital's Rule	theoretical	quiz
Week 15	heoretical	e student derstands the ject	Approximation (trapezoidal and Simpsons rule)	theoretical	quiz
Week 16	heoretical	e student derstands the ject	**Preparatory week before the final Exam**	theoretical	quiz

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

Course Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, and 6
	Assignments	2	10% (10)	Continuous	LO # 1,2,3,4,5, and 6
	Projects / Lab.	0			
	Report	0			LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	30% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thomas, Calculus by Anton , Bivens and Davis
Main references (sources)	Thomas, Calculus by Anton , Bivens and Davis
Recommended books and references (scientific journals, reports…)	Calculus I. - Advanced Engineering Mathematics by Alan Jeffrey.
Electronic References, Websites	Basic Engineering Mathematics tutorials.

Course Description Form

1. Course Name:	
Programing language	
2. Course Code:	
COE411	
3. Semester / Year:	
1 / 2024-2025	
4. Description Preparation Date:	
20/6/2025	
5. Available Attendance Forms:	
120	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7	
7. Course administrator's name (mention all, if more than one name)	
Name: Sazeen Taha Abdulrazzaq Email: sazeentaha4@ntu.edu.iq	
8. Course Objectives	
Course Objectives	1. Develop logical and analytical thinking by learning how to solve problems using structured programming steps. 2. Provide students with basic and advanced programming skills such as variables, loops, functions, and object-oriented (OOP) concepts. Enhance the ability to design and implement effective programs using C++ to solve real-world problems. 4. Enable students to understand software infrastructure and use concepts such as memory management, pointers, and files.
9. Teaching and Learning Strategies	
Strategy	Lectures, laboratories, workshops, summer training.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1st,	8	Learn the concept of algorithms and flowcharts, and analyze the logical steps of solving programming problems.	Algorithm and flow chart	Giving lectures	Feedback
2nd, 3rd	16	Understand the basic structure of a C++ program and write simple programs using the correct syntax. How to use data types and variables, and apply input/output principles to interact with the user.	Introduction to C++ (structure of program) Variables, data types, declaration of variables, scope of variables, initialization of variables, expression and basic input/output	Giving lectures and implementing computer programs	Feedback, daily and semester exams
4th, 5th	16	Apply various types of operators to write programming expressions that perform arithmetic and logical functions.	Operators (assignment, arithmetic operators, compound assignment, increase and decrease, relational and equality operators, conditional operator, bitwise operators, and explicit type casting operator)	Giving lectures, assigning students to solve exercises, and implementing them on the computer	Feedback, daily and semester exams
6th	8	Execute conditional statements using if and	Making decisions (if .. else and switch)	Interactive lectures, case	Feedback, daily and

		switch statements to make decisions within programs.		studies, group work, and applied projects.	semester exams
7th	8	Use for and while loops to perform repetitive operations efficiently.	Looping (while loop and for loop)	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
8th	8	Control program execution using jump statements such as break, continue, and goto.	Jump statements (break, continue and go to)	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
9th, 10th	16	Create functions using parameters and reference values, distinguish between variable types and scope, and apply recursive calling and polymorphism.	Functions (local and global variables, arguments passed by value and by reference, default values in parameters, overloaded functions and recursive functions)	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
11th	8	Use one- and two-dimensional arrays to store data and pass it to functions efficiently.	Arrays (single and tow dimensional arrays, arrays as parameters)	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams

2th, 13th	16	Understand the operation of pointers and their use to access and manipulate data, and work with pointers to functions and arrays.	Pointers (reference operator, dereference operator, declaring variables of pointer types, pointers and arrays, pointers and pointers, void pointers and pointers to functions)	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
4th, 15th	16	Implement dynamic memory allocation and release operations using new and delete, and verify the success of the allocation operation.	Dynamic memory (operators new and new [], check if the allocation memory is successful and operators delete and delete [])	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester 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

12. Learning and Teaching Resources

quired textbooks (curricular books, if any)	Available
Main references (sources)	C++ Primer (5th Edition)
Recommended books and references (scientific journals, reports…)	celerated C++: Practical Programming by Example Programming: Principles and Practice
Electronic References, Websites	s://www.youtube.com/playlist?list=PLlrATfBNZ98fq5g3jZA_hLGUrD4bo6

Course Description Form

1. Course Name:
Digital Logic
2. Course Code:

	COE125
3.	Semester / Year:
	Second semester / Stage one
4.	Description Preparation Date:
	19 / 06/ 2025
5.	Available Attendance Forms:
	In person attendance
6.	Number of Credit Hours (Total) / Number of Units (Total)
	60
7.	Course administrator's name (mention all, if more than one name)
	Name: Assist. Prof. Dr. Kusay Faisal Email: dr.kusay2024@ntu.edu.iq

8.	Course Objectives
Course Objectives	➢ Be able to convert between different number system. ➢ Understand binary arithmetic and binary codes. ➢ Knowing different binary logic gates with truth table. ➢ Simplify functions using Boolean Algebra And Karnaugh Map ➢ Be able to design a logic circuit required for computer applications. ➢ Having some ideas about Flip-Flop, Counters & registers.
9.	Teaching and Learning Strategies
Strategy	➢ The computer and data show will be used for lectures slides presentation, whiteboard and marker will be used for farther explanation. ➢ Lectures start with reminding students about previous topic. ➢ Students should contribute in all the lectures. ➢ Discuss each topic in details. ➢ Work in group as team work. ➢ Exercises and problem solving. ➢ At the end gives examples about the topic in practical life.
10.	Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1, 2	8	Introduction, viewing different Digital Number Systems	mbering Systems	Theory actical	Assignment 1
3, 4	8	Binary Arithmetic	ary Arithmetic, complement, and coding	Theory Practical	Assignment 2
5, 6	8	Binary Logic Gates	wing different Logic Gates with truth table	ory Practical	Quiz 1 Assignment 3
7	4	Midterm test		ory Practical	Test

8, 9,10	12	Boolean Algebra And Karnaugh Map	Duality Theorem nplification of Boolean nctions, Design Half Adder d Full adder, K- Map method	eory Practical	Quiz 2 Assignment 4
1, 12, 13	12	Flip-Flop& Counters	pes of F-F, counters, registers	eory Practical	Quiz 3 Assignment 5
14	4	Revision	Problem solving	eory Practical	Report
15	4	Final exam		eory Practical	Exam

11. Course Evaluation

There will be class activity, homework and quizzes throughout the semester, lecturer will give enough time to analyze, evaluate, and solve problems. As will as, there will be midterm and final exam for theory practical lectures.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Lecturer note sheet will be distributed among the students.
Recommended books and references (scientific journals, reports…)	➢ William J. Dally and R. Curtis Harting, *Digital Design: A Systems Approach*, Cambridge University Press, 2012 ➢ Zvi Kohavi and Niraj K. Jha, *Switching and Finite Automata Theory*, 3rd edition, Cambridge University Press, 2010. ➢ Donald E. Knuth, *The Art of Computer Programming, Volume 4A, Combinatorial Algorithms, Part 1*, Addison-Wesley, 2011. ➢ Kenneth J. Breeding, *Digital Design Fundamentals*, 2nd edition, Prentice-Hall, 1992
Electronic References, Websites	➢ https://classroom.google.com/c/Njg5ODE4Mzk0Njg1 ➢ https://engineering.purdue.edu/~meyer/DDU270/Refs/Pld/pal_guide.pdf ➢ https://www.uoitc.edu.iq/images/documents/informatics-institute/Competitive_exam/Logic_Design.pdf

Course Description Form

1. Course Name: first

2. Course Code: NTU102	
3. Semester / Year: first semester	
4. Description Preparation Date: 1\7\2025	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Email:	
8. Course Objectives	
	MATLAB is a widely used programming language and computational tool for numerical analysis, data visualization, and scientific computing. In undergraduate curricula, MATLAB teaching goals include developing students' skills in programming, data analysis, and problem solving, as well as providing them with a practical understanding of mathematical concepts and the analysis of complex computations and algorithms. **The most crucial goals for teaching MATLAB include learning outcomes, which include:** **1- Introduction to Programming: MATLAB is frequently used in academic curriculum as an introductory programming language. The main goal is to familiarize students with fundamental ideas in**

	programming, including variables, data types, control structures, functions, and algorithms. 2- Numerical Computation: MATLAB is frequently used for numerical computation, and one of the primary objectives of the MATLAB study program is to teach students how to conduct mathematical calculations, work with matrices, solve challenging equations, and put algorithms into practice for scientific, engineering, and mathematical applications. 3- Data Analysis and Visualization: MATLAB offers strong tools for data analysis and visualization. The built-in functions, toolboxes, and simulations of MATLAB are used by students to construct plots and graphs, show data in various forms, and do statistical analysis. 4- Simulation and Modeling: Many simulation and modeling jobs are performed using MATLAB. Students will learn how to create mathematical models, simulate systems, and analyze their behavior by utilizing MATLAB's simulation features. 5- Development of applications: MATLAB enables the creation of standalone programs and GUI-based user interfaces. For their projects and scientific research, students can learn how to write interactive programs, publish MATLAB code as standalone applications, and develop user-friendly interfaces.

	6- Development of applications: MATLAB enables the creation of standalone programs and GUI-based user interfaces. For their projects and scientific research, students can learn how to write interactive programs, publish MATLAB code as standalone applications, and develop user-friendly interfaces. 7- Problem-solving abilities are a common topic of MATLAB study programs. Students are encouraged to use their MATLAB and programming expertise to address real-world issues, developing their analytical and critical thinking skills.

9. Teaching and Learning Strategies

Strategy	learning and teaching strategies are methods used to help learners acquire knowledge and skills, and for teachers to effectively deliver instruction. There are various types of learning and teaching strategies, including: 1- Active learning entails involving students in tasks that demand their participation, critical thinking, and application of what they have learned. Group discussions, practical exercises, and problem-based learning are a few examples. 2- Collaborative learning: This involves group work and collaboration among learners to achieve a common goal. Examples include group projects and peer learning. 3- Inquiry-based learning: This involves encouraging learners to ask questions, explore topics, and find answers through research and experimentation. Examples and reports include scientific investigations and case studies. 4- Direct instruction: This involves the teacher providing information to learners in a structured and organized manner. Examples include lectures, demonstrations, and tutorials. 5- Differentiated instruction: This involves tailoring instruction to meet the needs of individual learners, based on their learning style, abilities, and interests.

	6- Technology-based instruction: This involves using technology tools and resources to enhance instruction and engage learners. Examples include online courses, interactive whiteboards, and educational apps. **7- Effective teaching and learning strategies often involve a combination of these approaches, tailored to the needs of the learners and the content being taught.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	2 theory 2 lab	**Introduction to MATLAB**	Introduction to MATLAB environment & MATLAB windows	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	Learning MATLAB commands & elementary mathematical functions	MATLAB commands & elementary mathematical functions	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	Understanding Matrices in MATLAB	Vectors and Matrices	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	Understanding Matrices in MATLAB	Vectors and Matrices	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	Understanding Algebraic Operations in MATLAB – Function Creation – Plotting in MATLAB	Solving basic algebraic equations & quadratic equations -Create function in files - MATLAB Introduction to Plotting, Plotting multiple plots & Plotting 3D	Practical and Theoretical	Homework Assignments Reports Quiz Exams

	2 theory 2 lab	Understanding Algebraic Operations in MATLAB – Function Creation – Plotting in MATLAB	Solving basic algebraic equations & quadratic equations-Create function in files - MATLAB Introduction to Plotting, Plotting multiple plots & Plotting 3D	Practical and Theoretical	Homework Assignments Reports Quiz Exams
		Mid-Exam	Mid-Exam		
	2 theory 2 lab	Understanding Logical Statements and Loops in MATLAB	Operational & logical Statements For-end loops & While- end loops	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	Understanding Logical Statements and Loops in MATLAB	Operational & logical Statements For-end loops & While- end loops	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	Understanding Conditional Statements in MATLAB	If statement	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	Understanding Integration & differentiation	Integration & differentiation	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	Understanding Fourier Transform in MATLAB	Fourier transform	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	Introduction to Simulink	Introduction to Simulink	Practical and Theoretical	Homework Assignments Reports Quiz Exams
	2 theory 2 lab	to Model How Equations in Simulink	Modeling equations in Simulink	Practical and Theoretical	Homework Assignments Reports Quiz Exams

	2 theory 2 lab	How to Model Electrical Circuits in Simulink	Modeling electrical cct. in Simulink	Practical and Theoretical	Homework Assignments Reports Quiz 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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	MATLAB An Introduction with Applications
Recommended books and references (scientific journals, reports…)	Introduction to Programming and Numerical Methods in MATLAB
Electronic References, Websites	

Course Description Form

1. Course Name:	
Digital Logic	
2. Course Code:	
COE125	
3. Semester / Year:	
Second semester / Stage one	
4. Description Preparation Date:	
19 / 06/ 2025	
5. Available Attendance Forms:	
In person attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof. Dr. Kusay Faisal Email: dr.kusay2024@ntu.edu.iq	
8. Course Objectives	
Course Objectives	➢ Be able to convert between different number system. ➢ Understand binary arithmetic and binary codes. ➢ Knowing different binary logic gates with truth table. ➢ Simplify functions using Boolean Algebra And Karnaugh Map ➢ Be able to design a logic circuit required for computer application ➢ Having some ideas about Flip-Flop, Counters & registers.
9. Teaching and Learning Strategies	
Strategy	➢ The computer and data show will be used for lectures slides presentation, whiteboard and marker will be used for farther explanation. ➢ Lectures start with reminding students about previous topic. ➢ Students should contribute in all the lectures. ➢ Discuss each topic in details. ➢ Work in group as team work. ➢ Exercises and problem solving. ➢ At the end gives examples about the topic in practical life.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1, 2		roduction, wing different	mbering Systems	Theory actical	Assignment 1

		;ital Number ;tems			
3, 4	8	lary thmetic	lary Arithmetic, complement, and coding	Theory Practical	Assignment 2
5, 6	8	lary Logic Gates	ewing different Logic Gates with truth table	eory Practical	Quiz 1 Assignment 3
7	4	Midterm test		eory Practical	Test
8, 9,10	12	Boolean gebra And Karnaugh Map	Duality Theorem nplification of Boolean nctions, Design Half der and Full adder, K-Map method	eory Practical	Quiz 2 Assignment 4
12, 13	12	Flip-Flop& Counters	pes of F-F, counters, registers	eory Practical	Quiz 3 Assignment 5
14	4	Revision	Problem solving	eory Practical	Report
15	4	Final exam		eory Practical	Exam

11. Course Evaluation

There will be class activity, homework and quizzes throughout the semester, lecturer will give enough time to analyze, evaluate, and solve problems. As will as, there will be midterm and final exam for theory practical lectures.

12. Learning and Teaching Resources

quired textbooks (curricular books, if any)	
Main references (sources)	Lecturer note sheet will be distributed among the students.
Recommended books and references (scientific journals, reports…)	➢ William J. Dally and R. Curtis Harting, *Digital Design: A Systems Approach*, Cambridge University Press, 2012 ➢ Zvi Kohavi and Niraj K. Jha, *Switching and Finite Automata Theory*, 3rd edition, Cambridge University Press, 2010. ➢ Donald E. Knuth, *The Art of Computer Programming, Volume 4A, Combinatorial Algorithms, Part 1*, Addison-Wesley, 2011. ➢ Kenneth J. Breeding, *Digital Design Fundamentals*, 2nd edition, Prentice-Hall, 1992
Electronic References, Websites	➢ https://classroom.google.com/c/Njg5ODE4Mzk0Njg1 ➢ https://engineering.purdue.edu/~meyer/DDU270/Refs/Pld/pal_guide.pdf ➢ https://www.uoitc.edu.iq/images/documents/informatics-institute/Competitive_exam/Logic_Design.pdf

Course Description Form

1. Course Name: Engineering Drawing Using Computer
2. Course Code: TECK102
3. Semester / Year: Semester
4. Description Preparation Date:2025/7/1
5. Available Attendance Forms: In-person
6. Number of Credit Hours (Total) / Number of Units (Total)
hr/5 100
7. Course administrator's name (mention all, if more than one name)
Name: Abrar K. Shukri Email: abraralshareef@ntu.edu.iq
8. Course Objectives

Course Objectives	1-Enabling students to obtain knowledge and understanding in the subject of engineering drawing and using the computer through the AutoCAD program 2- Understanding and teaching students the basics of engineering drawing related to computer engineering 3- Knowing the correct methods of engineering drawing using the computer and how to apply them in the AutoCAD program in the fields of engineering and computer engineering.

	Increasing the student's perience in identifying drawing l designing engineering and ctronic shapes and drawing nnections and electrical circuits.

9. Teaching and Learning Strategies	
Strategy	1- Providing students with the basics, additional topics, and field experiences related to the outputs of thinking and analysis. 2- Creating panel discussions during or outside the lectures to discuss scientific engineering topics that require thinking and analysis. 3- Asking the students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics. 4- Giving students homework and periodic reports.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	6	The student learns to use the drawing program, the menu bar, and the task bar.	The use of CAD in engineering drawing description of menu Bar and toolbars	PDF lectures, power point, Video	"Daily Quiz and test"
3,4,5,6	12	The student learns how to draw using the instructions for ellipses, rectangles, lines, rays, circles, points, arcs, etc.	drawing Ellipse ,Rectangle line ,Ray ,Circle point Arc, ---------- etc.	PDF lectures, power point, Video	"Daily Quiz and test"
7,8	6	The student learns to draw electronic circuits, mechanical/special features and use different layers,	CAD Electrical Mechanical/ Special features The	PDF lectures, power point, Video	"Daily Quiz and test"

			use of various layers,		
9,10,11	9	The student learns editing tools (cloning, cutting, pasting, deleting, and moving).	editing :commands ,copy ,cut ,paste ,erase move,	PDF lectures, power point, Video	"Daily Quiz and test"
12,13	6	The student learns to choose various shapes.	selecting objects,	PDF lectures, power point, Video	"Daily Quiz and test"
14,15	6	The student learns to draw multiple projections.	orthogonal ,projection ISO drawing.	PDF lectures, power point, Video	"Daily Quiz and test"

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	AutoCAD Beginning and Intermediate
Main references (sources)	AutoCAD from zero to hero
Recommended books and references (scientific journals, reports…)	Lectures given by the course instructor Books available in the college library
Electronic References, Websites	

Course Description Form

1. Course Name: Engineering Drawing Using Computer	
2. Course Code: TECK102	
3. Semester / Year: Semester	
4. Description Preparation Date:2025/7/1	
5. Available Attendance Forms: In-person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
hr/5 100	
7. Course administrator's name (mention all, if more than one name)	
Name: Abrar K. Shukri Email: abraralshareef@ntu.edu.iq	
8. Course Objectives	
Course Objectives	1-Enabling students to obtain knowledge and understanding in the subject of engineering drawing and using the computer through the AutoCAD program 2- Understanding and teaching students the basics of engineering drawing related to computer engineering 3- Knowing the correct methods of engineering drawing using the computer and how to apply them in the AutoCAD program in the fields of engineering and computer engineering. Increasing the student's experience identifying drawing and designing gineering and electronic shapes and

	wing connections and electrical cuits.

9. Teaching and Learning Strategies	
Strategy	1- Providing students with the basics, additional topics, and field experiences related to the outputs of thinking and analysis. 2- Creating panel discussions during or outside the lectures to discuss scientific engineering topics that require thinking and analysis. 3- Asking the students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics. 4- Giving students homework and periodic reports.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	6	The student learns to use the drawing program, the menu bar, and the task bar.	The use of CAD in engineering drawing description of menu Bar and toolbars	PDF lectures, power point, Video	"Daily Quiz and test"
3,4,5,6	12	The student learns how to draw using the instructions for ellipses, rectangles, lines, rays, circles, points, arcs, etc.	drawing Ellipse ,Rectangle line ,Ray ,Circle point Arc, ---------- etc.	PDF lectures, power point, Video	"Daily Quiz and test"
7,8	6	The student learns to draw electronic circuits, mechanical/special features and use different layers,	CAD Electrical Mechanical/ Special features The use of various layers,	PDF lectures, power point, Video	"Daily Quiz and test"
9,10,11	9	The student learns editing tools (cloning, cutting,	editing :commands ,copy ,cut	PDF lectures, power point,	"Daily Quiz and test"

		pasting, deleting, and moving).	,paste ,erase move,	Video	
12,13	6	The student learns to choose various shapes.	selecting objects,	PDF lectures, power point, Video	"Daily Quiz and test"
14,15	6	The student learns to draw multiple projections.	orthogonal ,projection ISO drawing.	PDF lectures, power point, Video	"Daily Quiz and test"

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	AutoCAD Beginning and Intermediate
Main references (sources)	AutoCAD from zero to hero
Recommended books and references (scientific journals, reports…)	Lectures given by the course instructor Books available in the college library
Electronic References, Websites	

Course Description Form

1. Course Name:	
Baath Party crimes	
2. Course Code:	
NTU 200	
3. Semester / Year:	
Semester 3.	
4. Description Preparation Date:	
21-6-2025	
5. Available Attendance Forms:	
Class	
6. Number of Credit Hours (Total)30 / Number of Units (Total)	
30 Hours 2 Credit	
7. Course administrator's name (mention all, if more than one name)	
Name: Mohanad Kamal Mohammed Email: mohanad.kamal25@ntu.edu.iq	
8. Course Objectives	
Course Objectives	**oducing students to the concept of crime, both linguistically and technically.** **p students become familiar with the oretical and practical aspects of the nes committed by the defunct Ba'ath Party.** **oducing students to Ba'athist violations inst individuals, as well as international s and conventions, which require further research and study.**
9. Teaching and Learning Strategies	
Strategy	Educational Strategies tive Learning 1. Organize classroom discussion groups on the man rights violations committed by the former Ba'ath Party

	Use brainstorming to analyze the human rights violations committed by the former Ba'ath Party operative Learning 1. Divide students into small groups to study the Ba'ath crimes 2. Organize group presentations on Ba'ath crimes eractive Lectures 1. Engage students by asking open-ended questions during the lecture ld Visits and Guest Speakers 1. Visit the Political Prisoners undation or the High Commission for Human Rights - Field sit to a retired judge to explain the role of the judiciary and e restrictions imposed on judicial authority during the era of the former Ba'ath Party Invite activists, lawyers, and academics to share their experiences Educational Resources 1. Reliable books and sources in Arabic and English 2. Awareness-raising and educational videos 3. Legal articles and analyses Evaluation Short and varied tests including objective and essay questions Preparing analytical reports Crimes and human rights violations committed by the former Ba'ath Party. Encouraging students to evaluate their own work and the performance of their peers.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	tement of the st important man rights lations that urred in Iraq	Violations of human rights and freedoms		Through open-ended questions - the topic the student benefited most from the student's opinion

					on the lecturer's topic
Second	2	tatement of the st important itical systems t the Iraqi people ve experienced ce the British upation	A descriptive overview of the political systems in Iraq		5-minute test at the end of the lecture
Third	2	ath violations of edom of pression and the dia and the lack eparation powers	The Baath regime's violation of public rights and freedoms		By evaluating each group's work for another group
Fourth	2	e most important gatives of pressive authority d its impact on iety	The impact of the Baath regime's behavior on society and its control over the state		By evaluating each group's work for another group.
Fifth	2	tement on athist violations d the role of ganizations in se violations	Field visit to the Office of the Human Rights Commission and the Political Prisoners Foundation		Preparing an evaluation form to evaluate the lecture by students

Sixth	2	nsitional justice raq	The impact of the transitional phase in combating authoritarian politics		The report is evaluated by the subject teacher based on the efforts made by the student and the sources used in the report.
Seventh	2	chological effects epressive avior	Psychological field		5-minute test at the end of the lecture
Eighth	2	est for students the material they ve covered in evious lectures	Test		It is evaluated through the students' test results
Ninth	2	e impact of pression on iety and religion	Social field - religion and state		By evaluating each group's work for another group.
Tenth	2	e impact of pressive authority culture d media	Culture, media and militarization of society		5-minute quiz at the end of the lecture
Eleventh	2	e negative effects ppressive	The impact of repression and war on the environment and population		hrough open-ended questions - the topic the student benefited most from - the student's opinion

		hority on the vironment and bulation			on the lecturer's topic
Twelfth	2	vironmental lution resulting m the authority of tyrant	The use of internationally prohibited weapons and environmental pollution		Through open-ended questions - the topic the student benefited most from - the student's opinion on the lecture topic
Thirteenth	2	mate change due environmental lution resulting m burning icultural land	Scorched earth policy, draining the marshes, and forced migration		5-minute quiz at the end of the lecture
Fourteenth	2	nomic effects of ressive policy	Destruction of the agricultural and animal environment and radioactive contamination		Through open questions - the topic that the student benefited most from - the student's opinion about the lecture topic

Fifteenth	2	ing innocent ople	Mass graves and bombing of places of worship		Preparing an evaluation form to assess human rights by students

11.
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. As follows: First, daily tests 10 points, assignments 5 points, seminar 10 points, daily attendance 5 points, midterm exam 10 points, final exam 60 points.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	e curriculum approved by the nistry of Higher Education and Scientific Research
Recommended books and references (scientific journals, reports…)	ticles of the Universal Declaration of man Rights - Reports of the Human Rights Commission ports of international organizations rking in the field of humanitarian airs, such as the UNAMI mission in Iraq Judicial decisions
Electronic References, Websites	ebsite of the United Nations High Commissioner for Human Rights ebsite of the National Institute for Human Rights

Course Description Form

1. Course Name: Measurements and Sensors
2. Course Code: COE213
3. Semester / Year: 2024-2015
4. Description Preparation Date:19-06-2025
5. Available Attendance Forms: Bologna System
6. Number of Credit Hours (Total) / Number of Units (Total) 60
7. Course administrator's name (mention all, if more than one name)
Name: Arkan Raoof Ismael Email: arkan.raoof23@ntu.edu.iq

8. Course Objectives	
Course Objectives	1- Understand the fundamental principles of measurement systems and sensor technologies. 2- Recognize various types of sensors and their practical applications in engineering. 3- Develop the ability to analyze, interpret, and validate measurement data. 4- Acquire hands-on skills in using electrical and electronic measuring instruments effectively.

9. Teaching and Learning Strategies	
Strategy	1- Lectures with visual aids and real-world examples. 2- Laboratory experiments for practical application of measurement techniques 3- Group activities and problem-solving sessions. 4- Assignments and case studies to reinforce theoretical concepts.

	5- Use of simulation software for virtual measurement and sensor analysis.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2-1	8	System of Unit and Standards of Measurement.	The aim of this topic is to introduce students to systems of units and measurement standards, and their role in the accuracy and reliability of engineering measurements.	Practical and Theoretical	Daily Written Quiz
5-4-3	12	Accuracy and precision types of error statistical analysis of data.	This topic explains the concepts of accuracy and precision, types of measurement errors, and statistical data analysis methods to obtain reliable results.	Practical and Theoretical	Daily Written Quiz
8-7-6	12	Instruments for measuring basic electrical parameters (electromechanical and electric instruments: design and dynamic	This topic covers electrical and electromechanical measuring instruments, their design and dynamic characteristics, along with the	Practical and Theoretical	Daily Written Quiz

		characteristics. Meter, reading, error and compensation).	analysis of readings, errors, and compensation methods.		
-10-9 11	12	Electronic measuring instrument.	This topic presents the operating principles of electronic measuring instruments and their use in accurately and efficiently measuring electrical signals and parameters.	Practical and Theoretical	Daily Written Quiz
13-12	8	Bridges (DC and AC Bridges: basic electrical parameters measurement, frequency measurement).	This topic explains the operation of electrical bridges (DC and AC) in accurately measuring basic electrical parameters such as resistance, capacitance, and frequency.	Practical and Theoretical	Daily Written Quiz
14	4	Oscilloscopes (CRT deflection, probes and functions, measuring techniques, types).	This topic covers oscilloscopes and their types, the beam deflection mechanism in CRT tubes, probe functions, and measurement techniques used in signal analysis.	Practical and Theoretical	Daily Written Quiz

15	4	Signal Generation (Introduction, The sine wave generator, frequency synthesized signal generator, frequency divider generator).	This topic presents the principles of electrical signal generation and the types of signal generators, such as the sine wave generator, synthesized signal generator, and frequency divider.	Practical and Theoretical	Daily Written Quiz

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	**Introduction to Instrumentation, Sensors, and Process Control**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	**tp://ali-almukhtar.blogspot.com**

Course Description Form

1. Course Name: Measurements and Sensors	
2. Course Code: COE213	
3. Semester / Year: 2024-2015	
4. Description Preparation Date:19-06-2025	
5. Available Attendance Forms: Bologna System	
6. Number of Credit Hours (Total) / Number of Units (Total) 60	
7. Course administrator's name (mention all, if more than one name)	
Name: Arkan Raoof Ismael Email: arkan.raoof23@ntu.edu.iq	
8. Course Objectives	
Course Objectives	5- Understand the fundamental principles of measurement systems and sensor technologies. 6- Recognize various types of sensors and their practical applications in engineering. 7- Develop the ability to analyze, interpret, and validate measurement data. 8- Acquire hands-on skills in using electrical and electronic measuring instruments effectively.
9. Teaching and Learning Strategies	
Strategy	6- Lectures with visual aids and real-world examples. 7- Laboratory experiments for practical application of measurement techniques 8- Group activities and problem-solving sessions. 9- Assignments and case studies to reinforce theoretical concepts.

	10- Use of simulation software for virtual measurement and sensor analysis.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2-1	8	System of Unit and Standards of Measurement.	The aim of this topic is to introduce students to systems of units and measurement standards, and their role in the accuracy and reliability of engineering measurements.	Practical and Theoretical	Daily Written Quiz
5-4-3	12	Accuracy and precision types of error statistical analysis of data.	This topic explains the concepts of accuracy and precision, types of measurement errors, and statistical data analysis methods to obtain reliable results.	Practical and Theoretical	Daily Written Quiz
8-7-6	12	Instruments for measuring basic electrical parameters (electromechanical and electric instruments: design and dynamic characteristics.	This topic covers electrical and electromechanical measuring instruments, their design and dynamic characteristics, along with the analysis of	Practical and Theoretical	Daily Written Quiz

		Meter, reading, error and compensation).	readings, errors, and compensation methods.		
-10-9 11	12	Electronic measuring instrument.	This topic presents the operating principles of electronic measuring instruments and their use in accurately and efficiently measuring electrical signals and parameters.	Practical and Theoretical	Daily Written Quiz
13-12	8	Bridges (DC and AC Bridges: basic electrical parameters measurement, frequency measurement).	This topic explains the operation of electrical bridges (DC and AC) in accurately measuring basic electrical parameters such as resistance, capacitance, and frequency.	Practical and Theoretical	Daily Written Quiz
14	4	Oscilloscopes (CRT deflection, probes and functions, measuring techniques, types).	This topic covers oscilloscopes and their types, the beam deflection mechanism in CRT tubes, probe functions, and measurement techniques used in signal analysis.	Practical and Theoretical	Daily Written Quiz

15	4	Signal Generation (Introduction, The sine wave generator, frequency synthesized signal generator, frequency divider generator).	This topic presents the principles of electrical signal generation and the types of signal generators, such as the sine wave generator, synthesized signal generator, and frequency divider.	Practical and Theoretical	Daily Written Quiz

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	**Introduction to Instrumentation, Sensors, and Process Control**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	**http://ali-almukhtar.blogspot.com**

Second level Courses

Course Description Form

1. Course Name: Engineering analysis
2. Course Code:
3. Semester / Year: Decisions
4. Description Preparation Date: 2025/06/21
5. Available Attendance Forms: Weekly / Theoretical and practical
6. Number of Credit Hours (Total) / Number of Units (Total) :
7. Course administrator's name (mention all, if more than one name)
Name: Email:

8. Course Objectives	
Course Objectives	1. The course curriculum aims to introduce the student to the skills of scientific mathematical foundations, qualify him with basic information, and teach him solutions to engineering problems using multiple numerical and engineering methods. 2. The student understands mathematical theories and laws that enable the student to apply them in the fields of engineering, whether in engineering analyzes or other applications. 3. The course also aims to teach students solutions to ordinary and partial differential equations, their applications, Fourier series, Laplace transformations, numerical methods, linear interpolation, numerical integration, and solutions to nonlinear equations.

9. Teaching and Learning Strategies	
Strategy	Learning and teaching strategies are methods used to help learners acquire knowledge and skills, and for teachers to effectively deliver instruction. There are various types of learning and teaching strategies, including:

	1. Active learning entails involving students in tasks that demand their participation, critical thinking, and application of what they have learned. Group discussions, practical exercises, and problem-based learning are a few examples. 2. Collaborative learning: This involves group work and collaboration among learners to achieve a common goal. Examples include group projects and peer learning. 3. Inquiry-based learning: This involves encouraging learners to ask questions, explore topics, and find answers through research and experimentation. Examples and reports include scientific investigations and case studies. 4. Direct instruction: This involves the teacher providing information to learners in a structured and organized manner. Examples include lectures, demonstrations, and tutorials. 5. Differentiated instruction: This involves tailoring instruction to meet the needs of individual learners, based on their learning style, abilities, and interests. 6. Technology-based instruction: This involves using technology tools and resources to enhance instruction and engage learners. Examples include online courses, interactive whiteboards, and educational apps. 7. Effective teaching and learning strategies often involve a combination of these approaches, tailored to the needs of the learners and the content being taught.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	heoretical + 2 ctical	e student derstands the ject	Laplace transform	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam.
Week 2	heoretical + 2 ctical	e student derstands the ject	inverse Laplace transform	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 3	heoretical + 2 ctical	e student derstands the ject	First order differential equations and their applications	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 4	heoretical + 2 ctical	e student derstands the ject The student derstands the ject	Second order differential equations and	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam

			their applications		
Week 5	heoretical + 2 ctical	e student derstands the ject	Higher order Linear differential equations	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 6	heoretical + 2 ctical	e student derstands the ject	Partial differential equations	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 7	heoretical + 2 ctical	e student derstands the ject	Fourier series for Periodic functions	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 8	heoretical + 2 ctical	e student derstands the ject The student derstands the ject	Even & odd functions and Half range expansion	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 9	heoretical + 2 ctical	e student derstands the ject	Power Series & Solution of ODE by Power Series	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 10	heoretical + 2 ctical	e student derstands the ject	numerical solution of non-linear equations : Newton-Raphson method, Secant Method	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 11	heoretical + 2 ctical	e student derstands the ject	Interpolation , Lagrange Interpolation , Newton's	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam

			divided difference interpolation		
Week 12	heoretical + 2 ctical	e student derstands the ject	Numerical methods for solving integration: Trapezoidal and Simpson's rules	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 13	heoretical + 2 ctical	e student derstands the ject	Numerical method for solving ordinary differential eq.(Euler method)	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 14	heoretical + 2 ctical	e student derstands the ject	Numerical method for solving ordinary differential eq. (Rung-Kutta method)	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 15	heoretical + 2 ctical	e student derstands the ject	Newton Method for Curve Editing	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final exam
Week 16	heoretical + 2 ctical	e student derstands the ject	Preparatory week before the final Exam	Blackboard. Examples. Discussion.	Daily exam. Homework. Pre-final 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

Course Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	LO #1, 2, 10 and 11	5, 10	LO #1, 2, and 6
	Assignments	2	LO # 3, 4, 6 and 7	2, 12	LO # 1,2,3,4,5, and 6
	Projects / Lab.	1	All	Continuous	
	Report	1	LO # 5, 8 and 10	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	LO # 1-7	7	LO # 1-7
	Final Exam	2hr	All	16	All
Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	vanced Engineering Mathematics", by Erwin Kreyszig. dvanced Mathematics for Engineers", by W. Ertel.
Main references (sources)	vanced Engineering Mathematics", by Erwin Kreyszig. dvanced Mathematics for Engineers", by W. Ertel.
Recommended books and references (scientific journals, reports…)	vanced Engineering Mathematics", by C. Ray Wylie. ndamentals of Differential Equations", by Nagle. Staff. Snider. merical Methods of Engineers", by Chapra & Canale. plied Numerical Analysis", by Gerald & Wheatley.
Electronic References, Websites	

Course Description Form

1. Course Name: Communication fundamentals
2. Course Code: COE222
3. Semester / Year: Semester
4. Description Preparation Date:2025/7/1
5. Available Attendance Forms: In-person
6. Number of Credit Hours (Total) / Number of Units (Total)
H 60
7. Course administrator's name (mention all, if more than one name)
Name: Abrar K. Shukri Email: abraralshareef@ntu.edu.iq
8. Course Objectives

Course Objectives	s module aims to provide a comprehensive understanding of fundamentals of communication, focusing primarily on nals and systems. It will delve into signal and system ssifications, energy and power considerations, and in-depth loration of Fourier series and transforms. The module will introduce key aspects of modulation and demodulation, ering both amplitude and angle modulation, and their responding frequency and phase modulation techniques.

9. Teaching and Learning Strategies	
Strategy	The module will employ a combination of strategies including but not limited to: 1. Lectures: To provide theoretical foundations on communication fundamentals. 2. Group Discussions: To facilitate understanding through the exchange of ideas. 3. Problem-Solving Sessions: To apply theoretical concepts to practical problems. 4. Practical Demonstrations: To illustrate key concepts, such as modulation and demodulation techniques. 5. Tutorials: To delve into complex topics like Fourier series and transforms. 6. Mid-term and final exams: To assess the understanding and application of knowledge. 7. Preparatory Week: To give students time to revise and clarify any difficulties before the final exam.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	8	**"Basic Concepts"**	Introduction to Signals and Systems	Theoretical and Practical	and test" "Daily Quiz
3,4,5,6	16	**"Analysis"**	signals and system definitions, Signal classifications , System Classifications Signal classifications " energy-Power"	Theoretical and Practical	and test" "Daily Quiz
7,8	8	**"Analysis"**	Fourier Series	Theoretical and Practical	and test" "Daily Quiz
9,10	8	**"Analysis"**	Fourier Series Spectra	Theoretical and Practical	and test" "Daily Quiz
11,12	8	**"Analysis"**	Decomposition of vectors and signals	Theoretical and Practical	and test" "Daily Quiz
13,14	8	**"Analysis"**	Complex Fourier Series (exponential)	Theoretical and Practical	and test" "Daily Quiz
15,16	8	**"Analysis"**	Complex Fourier Series (exponential) and signal Spectrum	Theoretical and Practical	and test" "Daily Quiz

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	"Communication Systems"
Main references (sources)	Lathi, B. P., & Ding, Zhi (2009). "Modern Digital and Analog Communication Systems". Oxford University Press

Recommended books and references (scientific journals, reports…)	Proakis, John G. & Salehi, Masoud (2008). "Communication Systems Engineering". Prentice Hall
Electronic References, Websites	

Course Description Form

1. Course Name:
First Course–Object Oriented Programming
2. Course Code:
COE2011
3. Semester / Year:
First –2024–2025
4. Description Preparation Date:
20–6–2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
30 weeks
7. Course administrator's name (mention all, if more than one name)
Name: Assist.Prof.Dr.Ann Zeki Ablahd Email:drann@ntu.edu.iq
8. Course Objectives

gnitive Objectives **- The aim is to understand the concepts of object–ented programming.** **- The aim is to understand the mechanism for gramming websites that use object–oriented gramming.** **- The aim is to understand the mechanism for structing programming ideas to address problems in**	

er sciences (mathematics, mechanical engineering,). **- The aim is to understand the requirements for working private companies as a programmer or technical engineer.**	

9. Teaching and Learning Strategies

Strategy	teractive Lectures and Seminars se Studies and Group Discussions actical Labs and Simulations oblem-Based Learning (PBL) e of Multimedia and E-learning platforms

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
3 +6+7	4 8 16	rn about the material rn how to install the compiler used C++) rn how to use inheritance in object-oriented programming	C++ review Object + class Inheritance	oretical and tical oretical and tical oretical and tical oretical and tical oretical and tical oretical and tical	ten daily test ten daily test ten daily test ten daily test ten daily test ten daily test ten daily test ten daily test ten daily test ten daily test

Required textbooks (curricular books, if any)	+ Hennessy, J. L., & Patterson, D. A. 019). Computer Architecture: A antitative Approach. Main References: tallings, W. (2020). Computer ganization and Architecture. Recommended Books and —
Main references (sources)	
Recommended books and references (scientific journals, reports…)	ferences: ournal of Parallel and Distributed mputing EEE Transactions on Computers

Electronic References, Websites	ACM Computing Surveys Electronic References / Websites: ttps://ieeexplore.ieee.org/ ttps://www.coursera.org/ ttps://www.sciencedirect.com/

Course Description Form

1. Course Name: **Physics**	
2. Course Code: TECK203	
3. Semester / Year: 2025	
4. Description Preparation Date: 2025-06-19	
5. Available Attendance Forms: Bologna System	
6. Number of Credit Hours (Total) / Number of Units (Total) 60	
7. Course administrator's name (mention all, if more than one name)	
Name: Arkan Raoof Ismael Email: arkan.raoof23@ntu.edu.iq	
8. Course Objectives	
Course Objectives	**1**− Understand fundamental concepts of motion, fo energy, and matter 2- pply physical laws to solve real-world problems.

	3- Develop analytical and problem-solving skills through experiments and calculations 4- Build a solid foundation for advanced studies in engineering and science.

1- Teaching and Learning Strategies

Strategy	1- Lectures with interactive explanations. 2- Problem-solving sessions and group discussions. 3- Laboratory experiments and hands-on activities. 4- Multimedia presentations and simulations.

2- Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2-1		**Understanding the nature of materials, their physical and atomic structure, and their energy levels."**	oduction to materials nce and engineering, rgy levels, Atomic cture and Polymer	**oretical**	tten daily quiz
4-3		Internal structure of cell, Resistance of Material and resistivity	**"Studying the internal structure of the cell and the resistance of materials."**	**oretical**	tten daily quiz
6-5		Electrıcal source current voltage, Types of impedances, their characteristics and methods of connection	**"Understanding electrical sources, impedances, their characteristics, and connection methods."**	**oretical**	tten daily quiz
8-7		Semiconductors Fundamentals, Extrinsic Semiconductors	**"Studying the fundamentals of semiconductors, their atomic structure, and the technological**	**oretical**	tten daily quiz

			applications of these elements."		
10-9		The P-N Junction, The P-N Junction diode, diode application	**"Studying the structure of the diode, its characteristics, and related applications."**	**oretical**	tten daily quiz
12-11		Type of diode (Zener diode, Light Emitting Diodes, Tunnel Diode)	**"Studying the types of diodes and their characteristics."**	**oretical**	tten daily quiz
-13 15-14		Transistor, Biploar transistor biasing, field effect transistor FET	**"Studying the transistor and its characteristics."**	**oretical**	tten daily quiz

3- 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

4- Learning and Teaching Resources

Required textbooks (curricular books, if any)	*damentals of Physics* by Halliday, Resnick, and Walker
Main references (sources)	Electronic devices by Tocci
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: Measurements and Sensors	
2. Course Code: COE213	
3. Semester / Year: 2024-2015	
4. Description Preparation Date:19-06-2025	
5. Available Attendance Forms: Bologna System	
6. Number of Credit Hours (Total) / Number of Units (Total) 60	
7. Course administrator's name (mention all, if more than one name)	
Name: Arkan Raoof Ismael Email: arkan.raoof23@ntu.edu.iq	
8. Course Objectives	
Course Objectives	9- Understand the fundamental principles of measurement systems and sensor technologies. 10- Recognize various types of sensors and their practical applications in engineering. 11- Develop the ability to analyze, interpret, and validate measurement data. 12- Acquire hands-on skills in using electrical and electronic measuring instruments effectively.
9. Teaching and Learning Strategies	
Strategy	11- Lectures with visual aids and real-world examples. 12- Laboratory experiments for practical application of measurement techniques 13- Group activities and problem-solving sessions. 14- Assignments and case studies to reinforce theoretical concepts. 15- Use of simulation software for virtual measurement and sensor analysis.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
2-1	8	System of Unit and Standards of Measurement.	The aim of this topic is to introduce students to systems of units and measurement standards, and their role in the accuracy and reliability of engineering measurements.	Practical and Theoretical	Daily Written Quiz
5-4-3	12	Accuracy and precision types of error statistical analysis of data.	This topic explains the concepts of accuracy and precision, types of measurement errors, and statistical data analysis methods to obtain reliable results.	Practical and Theoretical	Daily Written Quiz
8-7-6	12	Instruments for measuring basic electrical parameters (electromechanical and electric instruments: design and dynamic characteristics. Meter, reading, error and compensation).	This topic covers electrical and electromechanical measuring instruments, their design and dynamic characteristics, along with the analysis of readings, errors, and compensation methods.	Practical and Theoretical	Daily Written Quiz

-10-9 11	12	Electronic measuring instrument.	This topic presents the operating principles of electronic measuring instruments and their use in accurately and efficiently measuring electrical signals and parameters.	Practical and Theoretical	Daily Written Quiz
13-12	8	Bridges (DC and AC Bridges: basic electrical parameters measurement, frequency measurement).	This topic explains the operation of electrical bridges (DC and AC) in accurately measuring basic electrical parameters such as resistance, capacitance, and frequency.	Practical and Theoretical	Daily Written Quiz
14	4	Oscilloscopes (CRT deflection, probes and functions, measuring techniques, types).	This topic covers oscilloscopes and their types, the beam deflection mechanism in CRT tubes, probe functions, and measurement techniques used in signal analysis.	Practical and Theoretical	Daily Written Quiz
15	4	Signal Generation (Introduction, The sine wave generator, frequency synthesized signal generator, frequency divider generator).	This topic presents the principles of electrical signal generation and the types of signal generators, such as the sine	Practical and Theoretical	Daily Written Quiz

			wave generator, synthesized signal generator, and frequency divider.		

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	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	**Introduction to Instrumentation, Sensors, and Process Control**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	**http://ali-almukhtar.blogspot.com**

Course Description Form

1. Course Name :Arabic language
2. Course Code: NTU 100
3. Semester / Year: Semester
4. Description Preparation Date: 2025 /6/21
5. Available Attendance Forms: In –person
6. Number of Credit Hours (Total) 30 Hours / Number of Units (Total) 15

7. Course administrator's name (mention all, if more than one name)	
Name: Mohanad kamal mohammed Email: mohanad.kamal25@ntu.edu.iq	
8. Course Objectives	
Course Objectives	To increase the student's knowledge of the theoretical and historical development of human rights To develop the student's analytical and critical skills regarding current and future aspects of human rights To train the student on the importance of effective participation in public life as a means of promoting respect for human rights To enable the student to understand the importance of education and its role In promoting a culture of human rights • ..... • .....
9. Teaching and Learning Strategies	
Strategy	Lectures. Traditional lectures delivered by the instructor can provide an overview of -1 key concepts, theories, and historical developments in the field. Lectures can help students build foundational knowledge and understand the broader context of the topic. Discussions and Debates. Facilitating discussions and debates in class allows students 2- to actively engage with the course material, share their perspectives, and critically analyze different viewpoints. This can foster critical thinking, enhance communication skills, and encourage students to explore the complexities of human rights and democracy. Case Studies. The use of case studies and real-life examples can help students apply 3- theoretical knowledge to practical situations. Analyzing specific cases can deepen understanding, highlight challenges, and stimulate discussions about the implementation of human rights and democratic principles in different contexts Assessments and Feedback: Providing regular assessments such as tests, exams, or 4- essays can help students measure their understanding of the material and receive feedback on their progress. Constructive feedback can help students improve their knowledge and skills throughout the course.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge and understanding	Human Rights in Ancient Civilizations (Greek and Roman)	Theoretical	Discussion Asking Question
2	2	Knowledge and understanding	The Position of Divine Laws on Human Rights	Theoretical	Discussion Asking Question
3	2	Knowledge and understanding	Human Rights in International Constitutions	Theoretical	Discussion Asking Question
4	2	Knowledge and understanding	The United Nations Charter and its Position on Human Rights	Theoretical	Discussion Asking Question
5	2	Knowledge and understanding	Human Rights in International Organizations	Theoretical	Discussion Asking Question
6	2	Knowledge and understanding	Human rights in NGOs	Theoretical	Discussion Asking Question
7	2	Knowledge and understanding	Human rights guarantees	Theoretical	Discussion Asking Question
8	2	Knowledge and understanding	The concept of international humanitarian law and its historical development	Theoretical	Discussion Asking Question
9	2		First semester exam		
10	2	Knowledge and understanding	The relationship between Islam and democracy	Theoretical	Discussion Asking Question
11	2	Knowledge and understanding	Democratic Political Components	Theoretical	Discussion Asking Question
12	2	Knowledge and understanding	Democracy and Education	Theoretical	Discussion Asking Question
13	2	Knowledge and	The Concept of Democracy	Theoretical	Discussion Asking

		understanding			Question
14	2	Knowledge and understanding	Communication and development	Theoretical	Discussion Asking Question
15	2		Second Semester 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

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name :Arabic language
2. Course Code: NTU 203
3. Semester / Year: Semester
4. Description Preparation Date: 2025 /6/21
5. Available Attendance Forms: In –person
6. Number of Credit Hours (Total) 30 Hours / Number of Units (Total) 15
7. Course administrator's name (mention all, if more than one name)
Name: Mohanad kamal mohammed Email: mohanad.kamal25@ntu.edu.iq

8. Course Objectives

Course Objectives	The course aims to provide the most important Arabic language vocabulary in grammatical matters in a sufficient and comprehensive manner that affects the student's life and stays with him in the future. Introduce students to the basics of correct writing, such as differentiating between Arabic sentences and knowing their types. The course aims to provide the most important vocabulary in spelling and expressive matters in general. Teach students to differentiate between the closed taa and the open taa, as well as the difference between the letters dad and dha, and to know punctuation marks and the most common mistakes in the Arabic language ....

9. Teaching and Learning Strategies

Strategy	Questions and Discussions Strategy. - strategy to encourage students to learn the most important rules of the Arabic language (grammatical and morphological). - strategy to teach students how to employ general Arabic rules In spelling and expressive matters in their writing

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge and understanding	Introductory lecture and overview of types Arabic language	Theor Etical	Discussion Asking Question
2	2	Knowledge and understanding	Noun, Verb, and Participle Marks and How to Distinguish Between Them	Theoretical	Discussion Asking Question
3	2	Knowledge and	Original I'rab Marks	Theoretical	Discussion Asking

		understanding			Question
4	2	Knowledge and understanding	Secondary I'rab Marks	Theoretical	Discussion Asking Question
5	2	Knowledge and understanding	The Connected Taa and the Open Taa	Theoretical	Discussion Asking Question
6	2	Knowledge and understanding	Writing the Hamza In Arabic: Hamzat al-Wasl and Hamzat al-Qat'	Theoretical	Discussion Asking Question
7	2	Knowledge and understanding	Rules in the Science of Nominative and Final Grammar	Theoretical	Discussion Asking Question
8	2	Knowledge and understanding	Rules of the Grammar ,the subject	Theoretical	Discussion Asking Question
9	2		Punctuation		
10	2	Knowledge and understanding	Literary Text Surah Ar-Rahman	Theoretical	Discussion Asking Question
11	2	Knowledge and understanding	The Difference Between Dad and Tha Theoretical	Theoretical	Discussion Asking Question
12	2	Knowledge and understanding	Abu Firas Al-Hamdani	Theoretical	Discussion Asking Question
13	2	Knowledge and understanding	Punctuation Marks	Theoretical	Discussion Asking Question
14	2	Knowledge and understanding	Grammar Rules Subject Mandib	Theoretical	Discussion Asking Question
15	2		Second Semester 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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	

Electronic References, Websites	

Description for Third Level

Course Description Form

1. Course Name: Database
2. Course Code: COE224
3. Semester / Year: 2024-2025
4. Description Preparation Date: 1/7/2025
5. Available Attendance Forms: In-person
6. Number of Credit Hours (Total) / Number of Units (Total): 64 hours / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Muamar Almani Email: muamar78@ntu.edu.iq Name: Gona Mohammed Dhahir Email: gonamohammed201@ntu.edu.iq
8. Course Objectives

Course Objectives	provide students with a comprehensive understanding of fundamental concepts and principles of databases. familiarize students with the importance and applications atabases in various domains. enable students to design, develop, and manage relational abases effectively. ntroduce students to database management systems MS) and their role in data organization and retrieval.

	explore emerging trends and advancements in the field of abases.

9. Teaching and Learning Strategies

Strategy	aching Strategy ctures: The instructor will deliver interactive lectures to 1. roduce and explain key database concepts, principles, and techniques. ey will use visual aids, examples, and real-world case studies to enhance derstanding and engagement. actical Sessions: Hands-on practical sessions will be conducted to 2. ow students to apply the concepts learned during lectures. These ssions may involve exercises and assignments related to database sign, SQL queries, and implementation using a DBMS. scussions: Group discussions and debates will be encouraged to 3. ter critical thinking and deeper understanding of complex topics. udents can share their perspectives, ask questions, and engage in oblem-solving activities related to databases. se Studies: Real-world case studies will be presented to 4. monstrate the practical applications of databases in different industries. udents will analyze and discuss these case studies to gain insights into tabase design and management challenges. sessments: Regular assessments, including quizzes, assignments, 5. d exams, will be conducted to evaluate students' understanding of the ture material. These assessments will test theoretical knowledge as well practical skills related to database design and SQL querying. sources: Recommended textbooks, research papers, and online 6. resources will be provided to supplement the lecture content.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	4	oduction to Databases es of Data and Data Representation	Introduction to Databases es of Data and a Representation	cture and ctical	ly written quiz
2	4	a Models and Schemas rarchical and Network Models	a Models and Schemas rarchical and Network Models	cture and ctical	ly written quiz
3	4	ational Model and Relational Algebra Entity–Relationship (ER) Modeling	ational Model and Relational Algebra Entity–Relationship (ER) Modeling	cture and ctical	ly written quiz
4	4	nceptual, Logical, d Physical Schemas nslating ER grams into Relational Schemas	nceptual, Logical, d Physical Schemas nslating ER grams into Relational Schemas	cture and ctical	ly written quiz
5	4	QL: Data Definition nguage (DDL) QL: Data anipulation nguage (DML)	QL: Data Definition nguage (DDL) QL: Data anipulation nguage (DML)	cture and ctical	ly written quiz
6	4	QL: Querying and etrieving Data elational Database esign Principles	QL: Querying and etrieving Data elational Database esign Principles	cture and ctical	ly written quiz
7	4	rmalization chniques (1NF, IF, 3NF) tabase Design se Studies	rmalization chniques (1NF, IF, 3NF) tabase Design se Studies		term exam

8	4	d-term Assessment xam or Project)	d-term Assessment xam or Project)	ture and ctical	ly written quiz
9	4	roduction to tabase anagement Systems BMS) BMS Architecture d Components	roduction to tabase anagement Systems BMS) BMS Architecture d Components	ture and ctical	ly written quiz
10	4	elational Database anagement Systems DBMS) ansaction ocessing and ncurrency Control	elational Database anagement Systems DBMS) ansaction ocessing and ncurrency Control	ture and ctical	ly written quiz
11	4	dexing and Query timization ckup and Recovery ategies	dexing and Query timization ckup and Recovery ategies	ture and ctical	ly written quiz
12	4	vanced Topics in tabase anagement erging Trends: SQL Databases	vanced Topics in tabase anagement erging Trends: SQL Databases	ture and ctical	ly written quiz
13	4	g Data and stributed Databases oud-Based tabases	g Data and stributed Databases oud-Based tabases	ture and ctical	ly written quiz
14	4	g Data and stributed Databases oud-Based tabases	g Data and stributed Databases oud-Based tabases	ture and ctical	ly written quiz
15	4	g Data and stributed Databases	g Data and stributed Databases	ture and ctical	ly written quiz

		oud-Based tabases	oud-Based tabases		
16	4	paratory week ore the final Exam	paratory week ore the final Exam		al exam

11. Course Evaluation

Time/Number		Weight (Marks)
Quizzes	2	10% (10)
Assignments	2	10% (10)
Projects / Lab.	1	10% (10)
Report	1	10% (10)
Midterm Exam	2hr	10% (10)
Final Exam	2hr	50% (50)
Total assessment	100% (100 Marks)	

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	abase System Concepts" by Abraham erschatz, Henry F. Korth, and S. Sudarshan Grammar in Use by Raymond Murphy 5th edition
Main references (sources)	
Recommended books and references (scientific journals, reports…)	SQL Cookbook" by Anthony Molinaro
Electronic References, Websites	ek Banas: YouTube channel with tutorials on various database topics, including SQL LZoo: YouTube channel with video tutorials on SQL concepts and hands-on exercises Schools SQL Tutorial: A free online tutorial covering SQL syntax and concepts

Course Description Form

1. Course Name:	
Digital Controllers	
2. Course Code:	
COE007	
3. Semester / Year:	
First	
4. Description Preparation Date:	
21-06-2025	
5. Available Attendance Forms:	
In-person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60	
7. Course administrator's name (mention all, if more than one name)	
Name: Ihsan Hassan Hussein Email: ihsan.bayoglu@ntu.edu.iq	
8. Course Objectives	
Course Objectives	• Understanding Basic Concepts: Equip students with a comprehensive understanding of fundamental concepts in digital controllers, including digital signal processing and principles of digital control. • Dynamic Systems Analysis: Teach students to analyze dynamic and time-varying systems using digital methods, understanding system behavior and response to different inputs. • Digital Controller Design: Introduce techniques and methods for designing digital control systems, including open- and closed-loop systems. • Practical Applications: Develop practical skills in using digital computing tools and software to analyze and design digital controllers.
9. Teaching and Learning Strategies	
Strategy	The Digital Controllers course employs a blended approach to teaching and learning, combining theoretical instruction with hands-on practical experience to ensure comprehensive student engagement and skill acquisition. The primary strategies include:

	1. **Lectures and Interactive Discussions:** Core concepts are delivered through structured lectures supplemented by interactive discussions to enhance conceptual understanding and critical thinking. 2. **Blended Learning (Online & In-Perso** Use of e-learning platforms, video tutorials, and online assessments to support flexible a self-paced learning alongside classroom engagement.

10. Course Structure

Week	Hours 4 hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

Week	Hours	Intended Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
1st	4	• Theoretical lecture on PLC architecture and comparison with PIC controllers. • Viewing videos of industrial applications using PLCs.	Principle of PLC	• Theoretical lecture supported by PowerPoint and illustrations. • Interactive class discussion.	Quiz on fundamental concepts.
2nd–4th	4	• Analyze internal components of PIC microcontroller. • Explain register functions, memory units, I/O ports. • Interpret serial communication, UART, Baud rate. • Explain timers, counters, and oscillator.	Architecture of PIC Microcontroller	• PowerPoint-based lectures with illustrations.	Quiz on core concepts.
5th–7th	4	• Implement basic programs to read/write signals from microcontroller. • Display data on character and graphic LCDs. • Use controller to process input signals.	Programming the Microcontroller	• Theoretical lecture supported by PowerPoint and examples.	Quiz on key programming concepts.

8th–11th	4	• Use A/D converters and analog modules. • Program CCP units (Capture, Compare, PWM). • Manage interrupts within microcontroller. • Program EEPROM for data storage.	Advanced Microcontroller Functions	• Illustrated lectures + interactive discussion.	Quiz on key topics.
12th–15th	4	• Design and implement practical projects using microcontrollers. • Integrate software and hardware units in a real-world application. • Analyze and optimize project performance.	Application Projects of Microcontroller	• Guided lectures and practical discussion.	Quiz and project evaluation.

11. Course Evaluation

The evaluation of the "Digital Controllers" course is conducted through a multi-faceted approach that ensures fairness, transparency, and alignment with the intended learning outcomes. The evaluation focuses on both **student achievement** and **course effectiveness**

12. Learning and Teaching Resources

equired textbooks (curricular books, if any)	PIC Microcontroller and Embedded Systems: Using Assembly and C for PIC18, Pearson Education, 2008
Main references (sources)	
Recommended books and references (scientific journals, reports…)	• Programmable Logic Controllers (5th Edition), McGraw-Hill Education, 2016
Electronic References, Websites	https://academy.microchip.com

Course Description Form

1. Course Name:	
Digital Signal Processing	
2. Course Code:	
COE304	
3. Semester / Year:	
1st / 2024–2025	
4. Description Preparation Date:	
19–6–2025	
5. Available Attendance Forms:	
In-person lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 H / 3 Credits	
7. Course administrator's name (mention all, if more than one name)	
Name: Farooq Safauldeen Omar Email: fkutalar@ntu.edu.iq	
8. Course Objectives	
Course Objectives	• **1. Describe signals mathematically and understand how to perform arithmetic operations on them.** • **2. This course will provide an introduction to digital filters.** • **3. Discuss word length issues, multi–rate signal processing, and their applications.** • **4. Understand and classify digital signal processing systems.** • **5. Understand how analog signals are converted to digital signals.** • **6. Understand pulse and frequency analysis of discrete signals.** • **7. Design digital filters and study their response.**
9. Teaching and Learning Strategies	

Strategy	The module will utilize a variety of strategies including: 1. Lectures: To provide the theoretical aspects of network simulation. 2. Group Discussions: To facilitate learning through the exchange of ideas. 3. Practical Assignments: To provide hands-on experience in network simulation. 4. Lab Sessions: To provide practical understanding and experience of network elements, implementation, and troubleshooting. 5. Mid-term and final exams: To evaluate the understanding and application of the knowledge acquired. 6. Preparatory Week: To allow students to revise and consolidate their knowledge before the final exam.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	heoretical + ractical	e student derstands e topic	roduction to digital nal processing	eoretical + actical	iz
Secon d	heoretical + ractical	e student derstands e topic	sic elements of P, DSP vs. ASP, plication of DSP,	eoretical + actical	iz
Third	heoretical + ractical	e student derstands e topic	ntinues time signals discrete time nals	eoretical + actical	iz
Fourt h	heoretical + ractical	e student derstands e topic	screte time signals d sequences	eoretical + actical	iz
Fifth	heoretical + ractical	e student derstands e topic	screte time signals d sequences	eoretical + actical	iz
Sixth	heoretical + ractical	e student derstands e topic	screte time signals d sequences	eoretical + actical	iz
Seven th	heoretical + ractical	e student derstands e topic	ndard of discrete e signals quences)	eoretical + actical	iz
Eight h	heoretical + ractical	e student derstands e topic	it sample sequence, it step sequence,	eoretical + actical	iz

Ninth	heoretical + ractical	e student derstands e topic	it ramp sequence ponential sequence.	eoretical + actical	iz
Tenth	heoretical + ractical	e student derstands e topic	assification of crete time signals) tem properties	eoretical + actical	iz
Eleve nth	heoretical + ractical	e student derstands e topic	tic and dynamic tem, shift invariant d shift variant tem,	eoretical + actical	iz
Twelft h	heoretical + ractical	e student derstands e topic	usal and non-causal tem, linear and nlinear system, ble and unstable	eoretical + actical	iz
Thirte enth	heoretical + ractical	e student derstands e topic	nvolution: Direct m method,	eoretical + actical	iz
Fourt eenth	heoretical + ractical	e student derstands e topic	phical method, slide e method	eoretical + actical	iz
Fiftee nth	heoretical + ractical	e student derstands e topic	rrelation of discrete ne sequence cross rrelation and auto rrelation	eoretical + actical	iz

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Hwei P. Hsu, "Schaum's Outlines of Theory and Problems of Signals and Systems", McGraw- Hill Companies. *Monson H. Hayes," Schaum's Outline of Theory and Problems of Digital Signal Processing", McGraw- Hill Companies.
Main references (sources)	ei P. Hsu, "Schaum's Outlines of Theory and Problems of Signals and Systems", McGraw- Hill Companies.

Recommended books and references (scientific journals, reports…)	nputer organization and architecture: design for performance (8th edition) by William stalling
Electronic References, Websites	ps://www.tutorialspoint.com/dip/signals_and_system_introduction.htm

Course Description Form

1. Course Name: Digital Communication
2. Course Code: COE 305
3. Semester / Year: Semester
4. Description Preparation Date: 20/6/2025
5. Available Attendance Forms: Theoretical , Practical
6. Number of Credit Hours (Total) / Number of Units (Total) : 60 Hours
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Safaa Salman / Huda Hamza Abdulkhudhur Email: ahmed.safaa23@ntu.edu.iq / hudahamza.abdulkhudhur@ntu.edu.iq
8. Course Objectives

Course Objectives	**e main objective of this course is to teach the student e fundamental subjects of the digital communication at used for data and information transmission**

9. Teaching and Learning Strategies

Strategy	• Theoretical lectures • Practical application in the laboratory of curriculum vocabulary.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	4	Student learns	roduction to gital communication	cture and ctical plication	itten Quiz aily)
	4	Student learns	it signal and urier transform	cture and ctical plication	itten Quiz aily)
	4	Student learns	mpling theorem	cture and ctical plication	itten Quiz aily)
	4	Student learns	lse amplitude odulation	cture and ctical plication	itten Quiz aily)
	4	Student learns	lse code odulation	cture and ctical plication	itten Quiz aily)
	4	Student learns	ise consideration PCM	cture and ctical plication	itten Quiz aily)
	4	Student learns	nitation and odification of PCM	cture and ctical plication	itten Quiz aily)
	4	Student learns	lta modulation, lta-sigma odulation, adaptive lta modulation	cture and ctical plication	itten Quiz aily)
	4	Student learns	gital base band nsmission	cture and ctical plication	itten Quiz aily)
	4	Student learns	er-symbol erference	cture and ctical plication	itten Quiz aily)
	4	Student learns	nplitude shift ying	cture and ctical plication	itten Quiz aily)
	4	Student learns	equency shift ying	cture and ctical plication	itten Quiz aily)
	4	Student learns	adrature shift ying, offset QPSK	cture and ctical plication	itten Quiz aily)

	4	Student learns	nimum shift ying, M-ray PSK and ray QAM	cture and ctical plication	itten Quiz aily)
	4	Student learns	read spectrum stem, frequency pping FH	cture and ctical plication	itten Quiz aily)

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	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	ailable
Main references (sources)	**igital Communications by John G. Proakis h ed., McGraw-Hill, 2007):** **Digital Communications: Fundamentals d Applications by Bernard Sklar mmunications Engineering Series**
Recommended books and references (scientific journals, reports…)	**dern Communications Systems by dor Cooklev & Andrew Yagle (University Michigan Press, 2024)**
Electronic References, Websites	**https://teck.ntu.edu.iq**

Course Description Form

1. Course Name: English 3
2. Course Code: NTU 300
3. Semester / Year: Semester
4. Description Preparation Date: 20/6/2025
5. Available Attendance Forms: Theoretical
6. Number of Credit Hours (Total) / Number of Units (Total) : 30 Hours
7. Course administrator's name (mention all, if more than one name)

Name: Ahmed Safaa Salman
Email: ahmed.safaa23@ntu.edu.iq

8. Course Objectives

Course Objectives	**is course aims to develop university students' proficiency in glish, focusing on the skills necessary for academic success d effective communication in professional contexts. e course covers the basics of grammar, vocabulary, and ntence structure, while enhancing reading comprehension, tening, and writing skills. In addition, the course seeks to ild students' confidence in speaking English through teractive activities, discussions, and presentations.**

9. Teaching and Learning Strategies

Strategy	• Interactive lectures: Present linguistic and theoretical concepts through interactive lectures that encourage student participation and questions to enhance deep understanding of the topics. • Group discussions: Organize discussions in small or large groups on specific topics, allowing students to practice their language skills, exchange ideas, and stimulate critical thinking. • Practical exercises and interactive activities: Provide practical activities, such as grammar exercises, sentence construction, and writing exercises, to reinforce and solidify the practical application of acquired concepts. • Educational games and simulations: Use educational games and simulation activities, such as role-playing, to encourage students to interact effectively with the English language in a fun and engaging way. • Text analysis and reading literature: Present and analyze various texts in class, which helps students improve their reading comprehension skills, learn new vocabulary, and enhance critical thinking skills. • Problem-solving learning: Assign students linguistic problems or practical applications that require critical thinking and creative solutions, which enhances problem-solving skills. Personal guidance and counseling: Provide individual counseling and guidance sessions for students as needed to discuss their personal learning challenges and offer them necessary support.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

	2	Student learns	roduction to Grammar d Sentence Structure; sic Grammar and mmon Mistakes	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	cabulary Building; sing Words in Context d Academic rminology	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	ading Comprehension; mmarizing and raphrasing Techniques	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	iting Skills; Structuring says and Reports	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	tening Skills; derstanding Spoken nguage in Academic ntexts	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	eaking Skills; sentation chniques and Role-ying Activities	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	dterm Exam (Written)	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	vanced Grammar and uctures; Complex ntence Forms and king Words	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	cabulary Expansion; honyms, Antonyms, and rd Formation	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	ading Strategies; tical Reading and alysis	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	vanced Writing Skills; veloping Coherent guments and Editing	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	tening Practice; ademic Lectures and te-Taking Skills	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	vanced Speaking lls; Group Discussions d Debates	cture and ctical plication	itten Quiz (Daily)

	2	Student learns	derstanding Cultural ntexts; Using nguage in Diverse vironments	cture and ctical plication	itten Quiz (Daily)
	2	Student learns	view of Main Concepts; paration for the Final am	cture and ctical plication	itten Quiz (Daily)

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	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	00 Essential English words by Paul Nation
Main references (sources)	00 Essential English words by Paul Nation
Recommended books and references (scientific journals, reports…)	00 Essential English words by Paul Nation
Electronic References, Websites	**https://teck.ntu.edu.iq**

Course Description Form

1. Course Name:
Real time systems
2. Course Code:
COE302
3. Semester / Year:
Semester
4. Description Preparation Date:
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
3
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Nisham

Email: Mohammed.sefer@ntu.edu.iq

8. Course Objectives

Course Objectives	e aim of this module is to provide students with omprehensive understanding of real-time stems design, including their definitions, types, erational mechanisms, and related components. rough this module, students will gain insight o both analog and digital systems, their signal operties, and the conversion between them. ey will also learn about basic interfacing devices d techniques to control data transfer in real-time stems.

9. Teaching and Learning Strategies

Strategy	The module will employ a combination of strategies includi but not limited 1. Lectures: To provide the theoretical foundations of re time systems desi 2. Tutorials: To allow students to apply the theoreti knowledge in practical contex 3. Group Discussions: To facilitate understanding through t exchange of ide 4. Practical Assignments: To provide hands-on experience the design and operation of real-time syster 5. Mid-term and final exams: To assess the understandi and application of knowled 6. Assignment Presentations: To develop studen communication skills and provide an opportunity demonstrate their understandi 7. Preparatory Week: To give students time to revise a clarify any difficulties before the final exa

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1		LO #1	oduction – finitions of	ture, cussion	ticipation, Quiz

			al-Time stems		
2	3	LO #1	pes of Real-ne Systems	cture, cussion	iz
3	3	LO #2	sign Models l Proposal paration	cture, Tutorial	signment #1
4	3	LO #3	w Real-Time stems Work	cture, Group rk	ss Participation
5	3	LO #3, LO #4	nals and stems	cture, ctical Demo	iz
6	3	LO #4, LO #5	alog and gital Signals	cture, Lab	Evaluation
7	3	LO #5	alog Computer mponents	cture, Lab	ctical Task
8	3	LO #5	roduction to gital Systems	cture, Lab	Evaluation
9	2	LO #1–6	**dterm Exam**	itten Exam	dterm Exam (20%)
10	3	LO #6	C: Definitions, pes, ecifications	cture, Lab	iz
11	3	LO #6	C: Definitions, pes, ecifications	cture, Lab	iz
12	3	LO #7	sic Interfacing vices	cture, ctical	signment #2
13	3	LO #7	ntinued: erfacing vices	cture, Group rk	ject / Lab Task
14	3	LO #8	a Transfer ntrol chniques	cture, nulation Lab	port
15	3	LO #9	signment sentations	sentation, minar	sentation Evaluation
1	3	LO #1	roduction – finitions of al-Time stems	cture, cussion	ticipation, Quiz

11. Course Evaluation

Formative Assessments
- Quizzes (2 × 5%) – 10%
- Assignments (2 × 5%) – 10%
- Project/Labs – 10%
- Report – 10%

Summative Assessments
- Midterm Exam (2 hrs): 20%

	Final Exam (2 hrs): 50% •
12. Learning and Teaching Resources	
quired textbooks (curricular books, if any)	Liu, J. W. S. (2000). Real-Time Systems. Prentice Hall
Main references (sources)	petz, H. (2011). Real-Time Systems: Design Principles for Distributed Embedded Applications. Springer
Recommended books and references (scientific journals, reports…)	
ctronic References, Websites	

Course Description Form

1. Course Name:	
Electronic Systems Simulators	
2. Course Code:	
COE314	
3. Semester / Year:	
2nd Semester	
4. Description Preparation Date:	
20/06/2025	
5. Available Attendance Forms:	
In-person lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3	
7. Course administrator's name (mention all, if more than one name)	
Name: Shaymaa Jafar Email: shaymaaj.alzangana@ntu.edu.iq	
8. Course Objectives	
Course Objectives	• Understand circuit simulation theory • Learn SPICE / mixed-signal tools

	• Build and validate simulations of analog/digital systems

9. Teaching and Learning Strategies

Strategy	• Lectures covering numerical methods • Hands-on SPICE, Verilog-VHDL mix-signal labs • Simulation-based group projects

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		uit modeling s	CE foundations	ture + lab	z
		lyze analog uits	DC simulation		ignment
		nsient simulation	e-domain analysis	ture	z
		ed-signal ulation	ital & analog combo		term
0		nerical stability	gration methods	ture	nework
12		ign simulation ects	3-level simulation	up lab	ect part I
14		date simulation	nte Carlo, PVT		ort
16		l demos	ent simulation builds	entation	l exam/project

11. Course Evaluation

- Labs: 25%
- Quizzes: 15%
- Midterm: 20%
- Project: 30%
- Participation: 10%

12. Learning and Teaching Resources

quired textbooks (curricular books, if any)	• Sheldon Tan, *Computer-Aided Electronic Circuit Simulation*
Main references (sources)	• Ngspice/SPICE documentation
Recommended books and references (scientific journals, reports…)	

Electronic References, Websites	

Course Description Form

1. Course Name:	
Fundamentals of Control Engineering 1	
2. Course Code:	
COE301	
3. Semester / Year:	
First Semester	
4. Description Preparation Date:	
20/06/2025	
5. Available Attendance Forms:	
In-person lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3	
7. Course administrator's name (mention all, if more than one name)	
Name: Shaymaa Jafar Email: shaymaaj.alzangana@ntu.edu.iq	
8. Course Objectives	
Course Objectives	• Analyze dynamic systems in time and frequency domains • Design controllers using root locus and frequency response methods • Use MATLAB/Simulink for modeling and analysis
9. Teaching and Learning Strategies	
Strategy	• Lectures on theory and analysis • MATLAB/Simulink labs • Case studies & group problem solving
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1–2	4	odel dynamic systems	Time-domain odeling & Laplace	Lecture + lab	Homework
3–4	4	alyze stability	ot locus & stability margins	Lecture + MATLAB	Quiz
5–6	4	Frequency response analysis	ode, Nyquist plots	Lab + lecture	Assignment
7–8	4	esign basic controllers	PID, lead/lag compensators	Lab	Project part I
9–10	4	Implement ontrollers in Simulink	ractical modeling	Lab	Midterm
11–12	4	nalyze real system erformance	Case studies	Discussion	Report
13–14	4	mpare design methods	ime vs frequency domain	Guest lecture	Project part II
15–16	4	urse summary	view and exam prep	ecture review	Final exam
1–2	4	odel dynamic systems	Time-domain odeling & Laplace	Lecture + lab	Homework
3–4	4	alyze stability	ot locus & stability margins	Lecture + MATLAB	Quiz
5–6	4	Frequency response analysis	ode, Nyquist plots	Lab + lecture	Assignment
7–8	4	esign basic controllers	PID, lead/lag compensators	Lab	Project part I
9–10	4	Implement ontrollers in Simulink	ractical modeling	Lab	Midterm
11–12	4	nalyze real system erformance	Case studies	Discussion	Report
13–14	4	mpare design methods	ime vs frequency domain	Guest lecture	Project part II
15–16	4	urse summary	view and exam prep	ecture review	Final exam

11. Course Evaluation

- Homework & labs: 25%
- Quizzes: 15%
- Midterm: 25%
- Project: 25%
- Participation: 10%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	• Ogata, K. *Modern Control Engineering* (6th ed.)
Main references (sources)	
Recommended books and references (scientific journals, reports…)	• Dorf & Bishop, *Modern Control Systems*
Electronic References, Websites	

Course Description Form

1. Course Name:
Network Simulation
2. Course Code:
COE324
3. Semester / Year:
Semester
4. Description Preparation Date:
01/06/2023
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
100
7. Course administrator's name (mention all, if more than one name)
Name: Noor F. Mohammed Email: noor6faysal@gmail.com
8. Course Objectives

Course Objectives	module aims to provide students with an in-depth understanding of network simulation. course covers various aspects including simulator and emulator differences, advantages d limitations of network simulation, and simulation techniques. It introduces networking basics, terminologies, and common topologies. The course also delves into network itectures, protocols, and the OSI model. Furthermore, students will learn about different vork elements, implementation strategies, IP addressing, network management, and troubleshooting techniques.

9. Teaching and Learning Strategies

Strategy	The module will utilize a variety of strategies including: 1. Lectures: To provide the theoretical aspects of network simulation. 2. Group Discussions: To facilitate learning through the exchange of ideas. 3. Practical Assignments: To provide hands-on experience in network simulation. 4. Lab Sessions: To provide practical understanding and experience of network elements, implementation, and troubleshooting. 5. Mid-term and final exams: To evaluate the understanding and application of the knowledge acquired. 6. Preparatory Week: To allow students to revise and consolidate their knowledge before the final exam.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understanding d comprehension	troduction to Networks Simulation	Lectures Theoretical + Practical	Quiz
2	4	Understanding d comprehension	mulator vs Emulator	Lectures Theoretical+ Practical	Quiz
3	4	Understanding d comprehension	nefits and limitations	Lectures Theoretical+ Practical	Quiz
4	4	Understanding d comprehension	mulation techniques an engineering tool for nalyzing, planning, dimensioning, monitoring, and ilding real operating networks.	Lectures Theoretical+ Practical	Quiz
5	4	Understanding d comprehension	vent driven vs Time driven simulation techniques	Lectures Theoretical+ Practical	Quiz
6	4	Understanding d comprehension	Networking basics , Networking terminology	Lectures Theoretical+ Practical	Quiz
7	4	Understanding d comprehension	ommon physical and logical topologies.	Lectures Theoretical+	Quiz

				Practical	
8	4	Understanding d comprehension	Mid-term	Lectures Theoretical+ Practical	Quiz
9	4	Understanding d comprehension	Networking architectures d protocols, network connections nd the Open Systems terconnection (OSI) model.	Lectures Theoretical+ Practical	Quiz
10	4	Understanding d comprehension	Network Elements UBS, SWITCHS (L2,), ROUTERS, etc..)	Lectures Theoretical+ Practical	Quiz
11	4	Understanding d comprehension	Network mplementation with simulation , plementing Routing chniques (static and dynamic).	Lectures Theoretical+ Practical	Quiz
12	4	Understanding d comprehension	Understanding IP dressing, assigning IP ddresses, mapping logical host names to IP addresses, uting, and accessing e Internet. Why IPv6 is necessary and how multicasting works.	Lectures Theoretical+ Practical	Quiz
13	4	Understanding mprehension And	twork Management, emote management.	Lectures Theoretical+ Practical	Quiz
14	4	Understanding d comprehension	Network monitoring tools, and elements to optimize the performance of the network Solar winds, PRTG, etc..).	Lectures Theoretical+ Practical	Quiz
15	4	Understanding d comprehension	Troubleshooting	Lectures Theoretical + Practical	Quiz

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	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: power electronic	
2. Course Code: COE308	
3. Semester / Year: 2024-2025	
4. Description Preparation Date: 2025-06-19	
5. Available Attendance Forms: In-person	
6. Number of Credit Hours (Total) / Number of Units (Total)60	
7. Course administrator's name (mention all, if more than one name)	
Name: Arkan Raoof Ismael Email: arkan.raoof23@ntu.edu.iq	
8. Course Objectives	
Course Objectives	**1-** Understand the basic principles of power conversion and control using electronic devices. **2-** Analyze the operation of power electronic components such as

	diodes, thyristors, MOSFETs, and IGBT 3- Apply power electronic circuits in practical applications such as rectifiers, inverters, and motor drives.

9. Teaching and Learning Strategies

Strategy	1- Theoretical lectures supported by real-life examples and circuit analysis. 2- Practical laboratory sessions for implementing and testing power electronic circuits. 3- Problem-solving exercises and group discussions. 4- Assignments and project-based learning to reinforce theoretical knowledge.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	AC voltage controller on-off and single-phase angle controller	AC voltage control by switching the load on and off or changing the firing angle in a single phase."	Practical and Theoretical	Daily Written Quiz
2	4	Dimmer using diac-thyristor and diac-triac	"Voltage and lighting dimming using a DIAC with a thyristor or triac for power control."	Practical and Theoretical	Daily Written Quiz
3	4	Linear power supply	"A linear power supply used to convert AC to DC with stability and regularity."	Practical and Theoretical	Daily Written Quiz

4	4	DC chopper: principle of switch mode power supply	"The DC chopper is used to change the DC voltage based on the chopping principle in switch-mode power supplies."	Practical and Theoretical	Daily Written Quiz
5	4	Step-down converter (Buck)	"A converter that steps down DC voltage while maintaining the same current using chopping technique."	Practical and Theoretical	Daily Written Quiz
6	4	Step-up converter (Boost)	"A converter that boosts DC voltage to a higher level using efficient electronic components."	Practical and Theoretical	Daily Written Quiz
7	4	• التقييم النصفي (اختبار داخل الصف)			
8	4	Step-up/down converter (Buck-Boost)	"A converter that can either step up or step down the DC voltage as needed using an appropriate control circuit."	Practical and Theoretical	Daily Written Quiz
9	4	Inverter DC to AC converter	"A converter that changes DC to AC to power electrical loads."	Practical and Theoretical	Daily Written Quiz
10	4	Single-phase half inverter	"A single-phase half inverter that operates on half	Practical and Theoretical	Daily Written Quiz

			cycles to convert DC to AC."		
11	4	Single-phase bridge inverter	"A single-phase full-bridge inverter that converts DC to full-cycle AC."	Practical and Theoretical	Daily Written Quiz
12	4	Three-phase inverter	"A three-phase inverter that converts DC to three-phase AC to drive motors and power systems."	Practical and Theoretical	Daily Written Quiz
13	4	DC machine control – basic machine equation	"Control of DC machines with the study of the basic equations governing their electrical and mechanical motion."	Practical and Theoretical	Daily Written Quiz
14	4	DC drive	"A control and drive system for DC motors to regulate their speed and torque."	Practical and Theoretical	Daily Written Quiz
15	4	Control-feedback system of a DC drive	"A feedback control system for precise regulation of the speed and torque of a DC motor."	Practical and Theoretical	Daily Written Quiz
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	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	**POWER ELECTRONICS HANDBOOK**
Electronic References, Websites	

Description of Fourth Level Courses

Course Description Form

1. Course Name:
Second Course–Advanced Computer Technology
2. Course Code:
COE008
3. Semester / Year:
second –2024–2025
4. Description Preparation Date:
20–6–2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
30 weeks
7. Course administrator's name (mention all, if more than one name)
Name: Assist.Prof.Dr.Ann Zeki Ablahd Email:drann@ntu.edu.iq
8. Course Objectives

Course Objectives	**The course aims to:** **• Introduce advanced topics in modern compu technologies and architectures.**

	• **Enhance students' understanding of hig performance computing and parallel processin** • **Prepare students for research or industry ro involving advanced hardware/softw integration.**

9. Teaching and Learning Strategies

Strategy	Interactive Lectures and Seminars Case Studies and Group Discussions Practical Labs and Simulations Problem-Based Learning (PBL) Use of Multimedia and E-learning platforms

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	4 8 8 4 4 4	Introduction to Computers - Internal 80286 80386 Processor 8086 Microprocessor Architecture, 80x86 Paging Protected Mode Memory Addressing 80386 Processor . Local and Global Descriptor Tables Introduction to Computers	Organization of Compute Assembly Programming Introduction to Asser Programming Specifiers Descriptors	Theoretical and practical Theoretical and practical Theoretical and practical Theoretical and practical Theoretical and practical Theoretical and practical	written daily test written daily test written daily test written daily test written daily test written daily test written daily test written daily test written daily test written daily test written daily test written daily test

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 Participation & Quizzes 10%
Assignments & Reports 15%
Practical Labs 15%
Midterm Exam 20%
Final Exam 40%
Total 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Hennessy, J. L., & Patterson, D. A. (2019). Computer Architecture: A Quantitative Approach. • Main References:

	• Stallings, W. (2020). Computer Organization and Architecture. • Recommended Books and —
Main references (sources)	
Recommended books and references (scientific journals, reports…)	References: • Journal of Parallel and Distributed Computing • IEEE Transactions on Compute
Electronic References, Websites	• ACM Computing Surveys • Electronic References / Websites: • https://ieeexplore.ieee.org/ • https://www.coursera.org/ •https://www.sciencedirect.com

Course Description Form

1. Course Name:
Advanced Digital Electronics
2. Course Code:
COE410
3. Semester / Year:
First Semester
4. Description Preparation Date:
20/06/2025
5. Available Attendance Forms:
In-person lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
3
7. Course administrator's name (mention all, if more than one name)
Name: Shaymaa Jafar

Email: shaymaaj.alzangana@ntu.edu.iq

8. Course Objectives

Course Objectives	• Design complex systems like microprocessor datapaths • Use HDL (VHDL/Verilog) for logic design • Analyze memory systems and DSP circuits

9. Teaching and Learning Strategies

Strategy	• Lectures on HDL and architecture • Labs with FPGA implementation • Team-based capstone projects

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
		anced logic gn	Ms, pipelining	ture + lab	z
		L modeling	DL/Verilog basics		ignment
		nory systems	M, cache	ture + lab	z
		modules	ers, ALU		ect part I
0		L optimization	ing, resource use		term
12		em integration	roprocessor datapath	ect	ort
14		A synthesis	thesis & lementation	no	ect part II
16		ect showcase	l designs	ent	l exam/project

11. Course Evaluation

- Labs/assignments: 30%
- Quizzes: 10%
- Midterm: 20%
- Project: 30%
- Participation: 10%

12. Learning and Teaching Resources

quired textbooks (curricular books, if any)	• Mano & Ciletti, *Digital Design with RTL*

Main references (sources)	• Cook & Dennison, *Digital System Design Using VHDL*
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: **Computer and Network Security**	
2. Course Code: COE406	
3. Semester / Year: first / fourth year	
4. Description Preparation Date: 1/ 7 /2025	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
4 in week – total : 60 hours / no of unit is 3	
7. Course administrator's name (mention all, if more than one name)	
Name: Hajar Mujeeb Muhammed hassan Email: hajar.alkhalidy@ntu.edu.iq	
8. Course Objectives	
Course Objectives	1. To understand the classic and modern encryption, decryption algorithms 2. To develop knowledge about the security of OSI and TCP/IP. 3. To understand many types of encryption, decryption algorithms.

	4. How the to protect network completes while it works? 5. The Fundamental concepts security for computer and network. 6. To understand each used algorithm and its details. 7. Deal with classic and modern encryption, decryption algorithms.

9. Teaching and Learning Strategies	
Strategy	splay the Network reference models and how to use the protocol in connection the network

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	4	Introduction , Symmetric Ciphers model: plaintext, encryption algorithm, secret key, cipher text, decryption algorithm, a model of conventional encryption, Cryptography, Cryptanalysis, Block and stream cipher		ture + lab	assignment
Weeks 2 and 3	8	Ceaser cipher The affine cipher Mono alphabetic substitution cipher Shift cipher		ture + lab	blem set
Weeks 4	4	• Hill cipher • Playfair cipher		ture + lab	z + assignment

Weeks 5	4	• Polyalphbetic Ciphers • Vigenere cipher • Transportion Cipher		ture + reading	term exam
Week 6	4	• Affine Cipher • One Time Pad		ture + lab	blem set
Week 7	4	• Cryptanalysis of a Symmetric Key		ture + lab	ignment
Week 8,9	8	Symmetric Key algorithm DES –the Data Encryption Standard 16 round fesitel system		ture + project	ect checkpoint
Week 10	4	Public Key algorithm RSA - and other Symmetric Key algorithms		ect & entation	l exam/project
Week 11, 12	8	Authentication Protocols • Authentication Based on a Shared Secret Key • Establishing a Shared Key: The Diffie- Hellman Key Exchange • Authentication Using Key Distribution Center • Authentication Using Keberos Authentication Using Public Key Cryptography		ture + lab	assignment
Week 13	4	OSI Security Architecture, a model for network security Email Security PGP-Pretty Good Privacy S/MIME		ture + lab	blem set
Week 14, 15	8	Protocols of computer networks		ture + lab	z + assignment

		Protection Services • OS protection Services: protected objects and methods of OS Protection security of OS, memory and addressing Protection, fence Protection • Database Protection Services • Network Protection Services_ IP and E-Commerce Protection, VPN and next generation network Protection\			

11. Course Evaluation

- Problem Sets (coding + write-ups): 35%
- Midterm Exam: 25%
- Final Project (group design + presentation): 30%
- Class Participation and Discussion: 10%

12. Learning and Teaching Resources

Required Texts	*J. SEBERRY AND J. PIEPRZYK, Cryptography: An Introduction to Computer Security, Prentice-Hall, Upper Saddle River, New Jersey, 1989.*
Recommended Texts	*J. RIVES CHILDS, General Solution of the ADFGVX Cipher System, Aegean Park Press, Laguna Hills, California, 2001.*
	Computer Networking: A Top Down Approach, Jim Kurose, Keith Ross, 6th edition, 2012
Websites	https://cs155.stanford.edu/

Course Description Form

1. Course Name:
Artificial intelligence
2. Course Code:
COE405
3. Semester / Year:
2nd Semester
4. Description Preparation Date:
21/06/2025
5. Available Attendance Forms:
Class+Labs
6. Number of Credit Hours (Total) / Number of Units (Total)
3/3
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Nisham Email: Mohammed.sefer@ntu.edu.iq
8. Course Objectives

Course Objectives	Upon completing this course, students will be able to: • Formulate and model problems using appropriate AI representations (e.g., search, logic, probabilistic models) • Select and implement core AI algorithms: search, constraint solving, planning, probabilistic inference, and learning • Analyze algorithm performance and trade-offs through empirical testing and performance metrics

	• Integrate AI methods in applications such as game agents, robotics, computer vision

9. Teaching and Learning Strategies

Strategy	• Lectures: Deliver core theoretical concepts including search algorithms, logic, probabilistic reasoning, and machine learning. • Hands-on Programming Labs: Implement AI algorithms (e.g. pathfinding, constraint solving, classifiers) in Python, often using frameworks like Pac-Man AI or OpenAI Gym. • Problem Sets: Assign biweekly sets combining algorithm implementation with conceptual and analytical questions. • Reading Assignments and Discussions: Explore case studies and recent AI developments through academic papers and guided discussions. • Group Projects: Design, build, and evaluate an AI system or application collaboratively, reinforcing real-world application and teamwork skills. • Interactive Demos and Tutorials: Use visual tools and simulations to understand AI dynamics (e.g., decision trees, neural networks). • Online Learning Resources: Leverage video lectures, online quizzes, and programming platforms for flexible, asynchronous learning support.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1–2	4	Understand basic search representations & algorithms	Uninformed & heuristic search	Lecture + lab	Lab assignment
3–4	4	Apply adversarial search and constraint satisfaction	Game-playing & C	Lecture + lab	Problem set
5–6	4	Model planning & decision processes	Planning algorithr	Lecture + lab	Quiz + assignment
7–8	4	Understand knowledge representation & first-order logic	Logic & KR	Lecture + readin	Midterm exam
9–10	4	Model uncertainty and inference	Probability, Bayes nets, HMM	Lecture + lab	Problem set
11–12	4	Apply ML for classification and regression	Supervised learnir	Lecture + lab	Assignment
13–14	4	Explore reinforcement learning and robotics applications	RL & Robotics	Lecture + projec	Project checkpoint
15–16	4	Execute final AI system project	Project completior	Project & presentation	Final exam/project

11. Course Evaluation
• Problem Sets (coding + write-ups): 35% • Midterm Exam: 25% • Final Project (group design + presentation): 30% • Class Participation and Discussion: 10%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	• Russell, S. & Norvig, P. (2020). *Artificial Intelligence: A Modern Approach* (4th ed.), Pearson
Main references (sources)	• Winston, P. H. (1992). *Artificial Intelligence* (3rd ed.), Addison-Wesley
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
2.
Mobile Communications Systems
3. Course Code:
COE408
4. Semester / Year:
2nd / 2024−2025
5. Description Preparation Date:
19−6−2025
6. Available Attendance Forms:
In-person lectures
7. Number of Credit Hours (Total) / Number of Units (Total)
3 credits / 60 h
8. Course administrator's name (mention all, if more than one name)
Name: Farooq Safauldeen Omar Email: fkutalar@ntu.edu.iq

9. Course Objectives

Course Objectives	**The course aims to teach the student mobile cellular communications of all generations of systems and to study th internal structure of cells and coverage the communication process.**

10. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students

11. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2 theoretical + practical	The student understands the topic	Introduction to Wireless Communication System: Evolution mobile communications, Mobile Radio Syste around the world	Theoretical practical	quiz
Secon	2 theoretical + practical	The student understands the topic	Types of Wireless communication System, Compariso of Common wirele system, Trend in Cellular radio and personal communication	Theoretical practical	quiz

Third	2 theoretical + practical	The student understands the topic	Second generation (2G) systems. Evolv Second-Generation Systems (2.5G). Th Generation (3G) Systems. Fourth-Generation (4G) Systems. Fifth-Generation (5G) Systems	Theoretical practical	quiz
Four	2 theoretical + practical	The student understands the topic	The Cellular Conce System Design Fundamentals: Cellular system, Hexagonal geomet cell and concept of frequency reuse	Theoretical practical	quiz
Fifth	2 theoretical + practical	The student understands the topic	Channel Assignmer Strategies Distance frequency reuse ra	Theoretical practical	quiz
Sixth	2 theoretical + practical	The student understands the topic	Channel & co-chan interference reduction factor, S/ ratio consideration and calculation for Minimum Co-chan and adjacent interference, Hand Strategies, Umbrel Cell Concept	Theoretical practical	quiz
Seven h	2 theoretical + practical	The student understands the topic	Traffic Engineering Trunking and Grad of Service, Improvi Coverage & Capaci in Cellular System- splitting, Cell sectorization	Theoretical practical	quiz
Eight	2 theoretical + practical	The student understands the topic	Large scale path los Free Space Propagation loss equation, Path-loss NLOS and LOS systems, Reflection Ray ground reflecti model, Diffraction, Scattering, Link budget design	Theoretical practical	quiz

Ninth	2 theoretical + practical	The student understands the topic	Small scale multipa propagation: Impu model for multipat channel, Delay spread, Feher's del spread, upper bou Small scale	Theoretical practical	quiz
Tenth	2 theoretical + practical	The student understands the topic	Multipath Measurement parameters of multipath channels Types of small scal Fading, Rayleigh ar Rician distribution	Theoretical practical	quiz
Eleve h	2 theoretical + practical	The student understands the topic	Modulation Techniques for Mobile Radio: Revi for basic digital modulation techniques, QPSK,MSK,GMSK	Theoretical practical	quiz
Twel h	2 theoretical + practical	The student understands the topic	Multiple Access Techniques: Frequency Division Multiple Access (FDMA). Time Divis Multiple Access (TDMA). Spread Spectrum Multiple Access. Space Divis Multiple Access (SDMA)	Theoretical practical	quiz
Thirt nth	2 theoretical + practical	The student understands the topic	Wireless Systems: GSM system architecture, Radio interface, Protocols Localization and calling, Handover, Authentication and security in GSM, GS speech coding	Theoretical practical	quiz
Four enth	2 theoretical + practical	The student understands the topic	Concept of spread spectrum, Architecture of IS-9 CDMA system, Air interface, CDMA forward channels, CDMA reverse channels, Power control in CDMA,	Theoretical practical	quiz

			cellular technology GPRS system architecture		
Fifteenth	2 theoretical + practical	The student understands the topic	Recent trends: Wi-WiMAX, ZigBee Networks, Softwar Defined Radio, UW Radio, Wireless Ad hoc Network and Mobile Portability, Security issues and challenges in a Wireless network.	Theoretical practical	quiz

12. 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

13. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Wireless Communication Systems, Ke-Lin Du, M. N. S. Swamy
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Wireless Communications and Networks, William Stallings
Electronic References, Websites	https://www.coursera.org/learn/foundations-of-advanced-wireless-communication

Course Description Form

1. Course Name: English 4
2. Course Code: COE409
3. Semester / Year: 2024-2025
4. Description Preparation Date: 20/6/2025
5. Available Attendance Forms: In-person
6. Number of Credit Hours (Total) / Number of Units (Total): 60 hours / 4 units

7. Course administrator's name (mention all, if more than one name)

Name: Gona Mohammed Dhahir
Email: gonamohammed201@ntu.edu.iq

8. Course Objectives

Course Objectives	• Acquire comprehensive knowledge of English grammar, vocabulary, and sentence structure for accurate use in academic and professional contexts. • Understand and analyze academic and professional texts critically. • Learn academic writing techniques for essays and reports with logical and cohesive expression. • Develop effective listening skills to comprehend lectures and spoken texts. • Enhance speaking skills in formal and informal contexts with clarity and confidence. • Apply critical thinking to analyze and evaluate ideas and perspectives. • Appreciate cultural diversity and communicate effectively across different cultural settings.

9. Teaching and Learning Strategies

Strategy	• Interactive lectures • Group discussions • Practical exercises and language games • Project-based learning and presentations • Blended learning (e-learning and face-to-face) • Problem-solving activities • Self-learning assignments • Personal guidance sessions

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understand and app basic grammar rules	Introduction to grammar and sente structure	Lecture and practical	Daily written quiz
2	4	Build academic vocabulary and context usage	Vocabulary building and terminology	Lecture and practical	Daily written quiz
3	4	Develop reading comprehension and summarization	Reading and rephrasing	Lecture and practical	Daily written quiz
4	4	Structure academic articles and reports	Writing skills and structure	Lecture and practical	Daily written quiz
5	4	Improve listening in academic settings	Listening skills	Lecture and practical	Daily written quiz
6	4	Enhance speaking a presentation techniques	Speaking skills and role-play	Lecture and practical	Daily written quiz
7	2	Midterm assessmen	Midterm written exa		Midterm exam
8	4	Apply advanced grammar structures	Advanced grammar and sentence forms	Lecture and practical	Daily written quiz
9	4	Expand vocabulary through synonyms a word formation	Synonyms, antonym and word building	Lecture and practical	Daily written quiz
10	4	Apply critical readin strategies	Critical reading and analysis	Lecture and practical	Daily written quiz
11	4	Develop advanced writing and editing	Advanced writing ar argumentation	Lecture and practical	Daily written quiz
12	4	Practice academic listening and note-taking	Academic lectures a notes	Lecture and practical	Daily written quiz

13	4	Engage in advanced discussions and debates	Speaking: discussio and debates	Lecture and practical	Daily written quiz
14	4	Use English in diver cultural contexts	Cultural contexts	Lecture and practical	Daily written quiz
15	4	Review course cont and exam prep	Review and final pre	Lecture and practical	Daily written quiz
16	2	Final comprehensive evaluation	Final exam		Final 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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: PC Interfacing
2. Course Code: COE 412
3. Semester / Year: Semester
4. Description Preparation Date: 20/6/2025
5. Available Attendance Forms: Theoretical , Practical

6. Number of Credit Hours (Total) / Number of Units (Total) : 60 Hours

7. Course administrator's name (mention all, if more than one name)

Name: Ahmed Safaa Salman
Email: ahmed.safaa23@ntu.edu.iq

8. Course Objectives

Course Objectives	• It aims to learn about Pc interfacing circuits and how to design it • It aims to learn about Pc ports and to use it to interface • It aims to know about digital signal generator and converter

9. Teaching and Learning Strategies

Strategy	• Theoretical lectures • Practical application in the laboratory of curriculum vocabulary.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	8	Student learns	Regulated design o power supply	Lecture and Practical Application	Written Quiz (Daily)
3+4	8	Student learns	Parallel (Centronic port interface	Lecture and Practical Application	Written Quiz (Daily)
5+6	8	Student learns	Rs232 serial interface	Lecture and Practical Application	Written Quiz (Daily)
7+8	8	Student learns	Universal serial bus (USB) interface	Lecture and Practical Application	Written Quiz (Daily)
9+10	8	Student learns	Parallel to serial Serial to parallel	Lecture and Practical Application	Written Quiz (Daily)

11+12	8	Student learns	Analog to Digital converter	Lecture and Practical Application	Written Quiz (Daily)
13+14	8	Student learns	Digital to Analog converter	Lecture and Practical Application	Written Quiz (Daily)
15	4	Student learns	Application project	Lecture and Practical Application	Written Quiz (Daily)

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

12. Learning and Teaching Resources	
Required textbooks (curricular books any)	Available
Main references (sources)	**1-Serial Port Complete: COM Ports, USB Virtual COM Ports, and Ports for Embedded Systems (Jan Axelson, 2007)** **2-PC Interfacing and Data Acquisition: Techniques for Measurement, Instrumentation and Control by Kevin James**
Recommended books and references (scientific journals, reports…)	• **Jan Axelson – Serial Port Complete International Journal of Electronics and** • **Computer Science Engineering (IJECSE)**
Electronic References, Websites	**https://teck.ntu.edu.iq**

Course Description Form

1. Course Name:
Computer Networks
2. Course Code:
COE413
3. Semester / Year:
First Semester
4. Description Preparation Date:
21/06/2025
5. Available Attendance Forms:
Class+Labs

6. Number of Credit Hours (Total) / Number of Units (Total)

3/3

7. Course administrator's name (mention all, if more than one name)

Name: Mohammed Nisham
Email: Mohammed.sefer@ntu.edu.iq
Name: Hajar Mujeeb
Email: hajar.alkhalidy@ntu.edu.iq

8. Course Objectives

Course Objectives	• Explain network architecture and protocols • Use Packettracer • Program basic client-server applications

9. Teaching and Learning Strategies

Strategy	• Lectures on protocol stacks • Labs with Packet Tracer • Group network programming project

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1–2	4	Understand layers	OSI & TCP/IP	Lecture + lab	Quiz
3–4	4	Analyze traffic	Wireshark labs	Lab	Assignment
5–6	4	Transport protocols	TCP/UDP	Lecture + lab	Quiz
7–8	4	Routing & addressing	IP, ARP	Lab	Midterm
9–10	4	Sockets programming	Client-server	Lab	Project part I
11–12	4	Multicasting/WAN	Routing labs	Lecture + lab	Assignment
13–14	4	Network security basics	Encryption, TLS	Lecture	Quiz
15–16	4	Final project	Network app	Presentation	Project & final exam

11. Course Evaluation

- Labs/assignments: 30%
- Quizzes: 10%
- Midterm: 20%
- Project: 30%
- Participation: 10%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	• Kurose & Ross, *Computer Networking: A Top-Down Approach*
Main references (sources)	• Peterson & Davie, *Computer Networks: A Systems Approach*
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Project Management	
2. Course Code:	
COE407	
3. Semester / Year:	
2 / 2024–2025	
4. Description Preparation Date:	
20/6/2025	
5. Available Attendance Forms:	
60	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3	
7. Course administrator's name (mention all, if more than one name)	
Name: Sazeen Taha Abdulrazzaq Email: sazeentaha4@ntu.edu.iq	
8. Course Objectives	
Course Objectives	1.Provides students with the basic concepts of innovative projects, includ the project life cycle, modern business phases, and project objectives 2.Define project planning through scope, timelines, and resource and c estimation.

	3.Introduces students to project tracking tools and methods, such as mu management, quality control, and performance. 4.Develops the social and organizational skills necessary to create effec and innovative teams throughout all project phases.

9. Teaching and Learning Strategies

Strategy	Lectures, laboratories, workshops, summer training, graduation projects.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	4	Understand project management principles and apply project planning and monitoring tools such as Gantt and Workstations.	Project Management	Giving lectures	Feedback
2nd	4	Evaluate the economic factors influencing engineering decisions and	Economics and management for the engineers	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams

		apply financial management principles to projects.			
3rd	4	Design an effective layout for factories and workshops to improve workflow and reduce waste.	Layout of factories and workshops	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
4th	4	Analyze productivity factors and propose strategies to improve performance and process efficiency.	Productivity	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
5th	4	Create network models for	Networks	Interactive lectures, case studies, group	Feedback, daily and semester exams

		projects and interpret the relationship between activities and critical paths.		work, and applied projects.	
6th	4	Apply the critical path method to determine project duration and the paths affecting the schedule.	Critical path method (CPM)	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
7th	4	Use the PERT technique to estimate time and cost and analyze uncertainty in projects.	Pet technique (Time and cost)	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
8th	4	Learn to solve resource allocation problems using	The resource allocation problems	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams

		load tables and scheduling tools.			
9th	4	Formulate and solve linear programming models using graphical and simplex methods to achieve optimal resource utilization.	Linear programming (graphical method, simplex method	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
10th	4	Calculate the economic order quantity and evaluate its impact on reducing storage and ordering costs.	Inventory models (Economic order quantity) (EOQ)	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
11th	4	Analyze the break-even point to determine the	The break-even point	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams

		minimum production or sales required to achieve profitability.			
12th	4	Distinguish between types of inventory costs and evaluate their impact on purchasing and storage decisions.	The cost of inventory	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
13th	4	Explain the types of maintenance policies and compare preventive, corrective, and predictive maintenance.	Maintenance policy and concepts	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams

14th	4	Apply quality control tools to monitor processes and improve production output.	Quality control	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester exams
15th	4	Identifying employee management methods and analyzing the relationship between the work environment and employee performance.	Employer management	Interactive lectures, case studies, group work, and applied projects.	Feedback, daily and semester 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

12. Learning and Teaching Resources

Required textbooks (curricular books any)	Available
Main references (sources)	Project Management for Engineering, Business and Technology (7th edition)

Recommended books and references (scientific journals, reports…)	*Operations Management,* Quality Control and Industrial Statistics
Electronic References, Websites	https://www.youtube.com/@projectmanagementsimplified

Course Description Form

1. Course Name:
Research Methodology
2. Course Code:
COE415
3. Semester / Year:
Semester
4. Description Preparation Date:
2024/11/11
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
60
7. Course administrator's name (mention all, if more than one name)
Name: Noor Faisal Mohammed Email: noor6faysal@ntu.edu.iq
8. Course Objectives

Course Objective	**• Introducing students to the concept and importance of scientific research.** **• Teaching students the characteristics of scientific thinking and scientific resear** **• Teaching students the types of research and scientific methodologies.** **• Introducing students to the steps of scientific research.** **• Teaching students methods for drawing samples from research communities.** **• Introducing students to quantitative and qualitative data collection tools.**

9. Teaching and Learning Strategies

Strategy	• Introducing students to the concept and importance of scientific research. • Teaching students the characteristics of scientific thinking and scientific research. • Teaching students the types of research and

	scientific methodologies. • Introducing students to the steps of scientific research. • Teaching students methods for drawing samples from research communities. • Introducing students to quantitative and qualitative data collection tools.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	2	Understandin and comprehension	FORMAL & INFORMAL TECHNICAL REPORT	Theoretical	Quiz
	2	Understandin and comprehension	FORMAL&INFORMAI TECHNICAL REPORT	Theoretical	Quiz
	2	Understandin and comprehension	FORMAL&INFORMAI TECHNICAL REPORT	Theoretical	Quiz
	2	Understandin and comprehension	FORMAL&INFORMAI TECHNICAL REPORT	Theoretical	Quiz
	2	Understandin and comprehension	BUSINESS CORRESPONDENCE	Theoretical	Quiz
	2	Understandin and comprehension	BUSINESS CORRESPONDENCE	Theoretical	Quiz
	2	Understandin and comprehension	Mid-term Exam	Theoretical	Quiz
	2	Understandin and comprehension	PROFESSIONAL PRESENTATIONS	Theoretical	Quiz
	2	Understandin and comprehension	PROFESSIONAL PRESENTATIONS	Theoretical	Quiz
	2	Understandin and comprehension	RESUME & CVs	Theoretical	Quiz
	2	Understandin and comprehension	RESUME & CVs	Theoretical	Quiz
	2	Understandin and comprehension	WRITING PROPOSA & SOPs	Theoretical	Quiz
	2	Understandin and comprehension	WRITING PROPOSA & SOPs	Theoretical	Quiz
	2	Understandin and comprehension	WRITING PROPOSA & SOPs	Theoretical	Quiz
	2	Understandin and comprehension	**Preparatory week bef the final Exam**	Theoretical	Quiz

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	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
First	
2. Course Code:	
NTU 102	
3. Semester / Year:	
second semester /2024 -2025 Bologna	
4. Description Preparation Date:	
1\6\2025	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3	
7. Course administrator's name (mention all, if more than one name)	
Name: Mohammed Nayyef Qasim Email: mohammed.naife@ntu.edu.iq	
8. Course Objectives	
	MATLAB is a widely used programming language and computational tool for numerical analysis, data visualization, and scientific computing. In undergraduate curricula, MATLAB teaching goals include developing students' skills in programming, data analysis, and problem solving, as well as providing them with a practical

	understanding of mathematical concepts and the analysis of complex computations and algorithms. The most crucial goals for teaching MATLAB include learning outcomes, which include: 1- Introduction to Programming: MATLAB is frequently used in academic curriculum as an introductory programming language. The main goal is to familiarize students with fundamental ideas in programming, including variables, data types, control structures, functions, and algorithms. 2- Numerical Computation: MATLAB is frequently used for numerical computation, and one of the primary objectives of the MATLAB study program is to teach students how to conduct mathematical calculations, work with matrices, solve challenging equations, and put algorithms into practice for scientific, engineering, and mathematical applications. 3- Data Analysis and Visualization: MATLAB offers strong tools for data analysis and visualization. The built-in functions, toolboxes, and simulations of MATLAB are used by students to construct plots and graphs, show data in various forms, and do statistical analysis. 4- Simulation and Modeling: Many simulation and modeling jobs are performed using MATLAB. Students will learn how to create mathematical models, simulate systems, and analyze their behavior by utilizing MATLAB's simulation features. 5- Development of applications: MATLAB enables the creation of standalone

	programs and GUI-based user interfaces. For their projects and scientific research, students can learn how to write interactive programs, publish MATLAB code as standalone applications, and develop user-friendly interfaces. 6- Development of applications: MATLAB enables the creation of standalone programs and GUI-based user interfaces. For their projects and scientific research, students can learn how to write interactive programs, publish MATLAB code as standalone applications, and develop user-friendly interfaces. 7- Problem-solving abilities are a common topic of MATLAB study programs. Students are encouraged to use their MATLAB and programming expertise to address real-world issues, developing their analytical and critical thinking skills.

9. Teaching and Learning Strategies

Strategy	learning and teaching strategies are methods used to help learners acquire knowledge and skills, and for teachers to effectively deliver instruction. There are various types of learning and teaching strategies, including: 1- Active learning entails involving students in tasks that demand their participation, critical thinking, and application of what they have learned. Group discussions, practical exercises, and problem-based learning are a few examples. 2- Collaborative learning: This involves group work and collaboration among learners to achieve a common goal. Examples include group projects and peer learning. 3- Inquiry-based learning: This involves encouraging learners to ask questions, explore topics, and find answers through research and experimentation. Examples and reports include scientific investigations and case studies.

	4- Direct instruction: This involves the teacher providing information to learners in a structured and organized manner. Examples include lectures, demonstrations, and tutorials. **5- Differentiated instruction: This involves tailoring instruction to meet the needs of individual learners, based on their learning style, abilities, and interests.** **6- Technology-based instruction: This involves using technology tools and resources to enhance instruction and engage learners. Examples include online courses, interactive whiteboards, and educational apps.** **7- Effective teaching and learning strategies often involve a combination of these approaches, tailored to the needs of the learners and the content being taught.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theory+ 2 lab	The student understands the topic	Introduction to MATLAB environment & MATLAB windows	Practical and Theoretical	Homework Assignments Reports Quiz Exams
2	2 theory+ 2 lab	The student understands the topic	MATLAB commands & elementary mathematical functions	Practical and Theoretical	Homework Assignments Reports Quiz Exams
3	2 theory+ 2 lab	The student understands the topic	Vectors and Matrices	Practical and Theoretical	Homework Assignments Reports Quiz Exams
4	2 theory+ 2 lab	The student understands the topic	Vectors and Matrices	Practical and Theoretical	Homework Assignments Reports Quiz Exams

5	2 theory+ 2 lab	The student understands the topic	Solving basic algebraic equations & quadratic equations -Create function in files - MATLAB Introduction to Plotting, Plotting multiple plots & Plotting 3D	Practical and Theoretical	Homework Assignments Reports Quiz Exams
6	2 theory+ 2 lab	The student understands the topic	Solving basic algebraic equations & quadratic equations-Create function in files - MATLAB Introduction to Plotting, Plotting multiple plots & Plotting 3D	Practical and Theoretical	Homework Assignments Reports Quiz Exams
7		Mid-Exam	Mid-Exam		
8	2 theory+ 2 lab	The student understands the topic	Operational & logical Statements For-end loops & While- end loops	Practical and Theoretical	Homework Assignments Reports Quiz Exams
9	2 theory+ 2 lab	The student understands the topic	Operational & logical Statements For-end loops & While- end loops	Practical and Theoretical	Homework Assignments Reports Quiz Exams
10	2 theory+ 2 lab	The student understands the topic	If statement	Practical and Theoretical	Homework Assignments Reports Quiz Exams
11	2 theory+ 2 lab	The student understands the topic	Integration & differentiation	Practical and Theoretical	Homework Assignments Reports Quiz Exams
12	2 theory+ 2 lab	The student understands the topic	Fourier transform	Practical and Theoretical	Homework Assignments Reports Quiz Exams

13	2 theory+ 2 lab	The student understands the topic	Introduction to Simulink	Practical and Theoretical	Homework Assignments Reports Quiz Exams
14	2 theory+ 2 lab	The student understands the topic	Modeling equations in Simulink	Practical and Theoretical	Homework Assignments Reports Quiz Exams
15	2 theory+ 2 lab	The student understands the topic	Modeling electrical cct. in Simulink	Practical and Theoretical	Homework Assignments Reports Quiz 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

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	MATLAB An Introduction with Applications
Recommended books and references (scientific journals, reports…)	An Introduction to Programming and Numer Methods in MATLAB
Electronic References, Websites	

Course Description Form

13. Course Name:
Second
14. Course Code:
NTU 202
15. Semester / Year:
second semester /2024 -2025 Bologna
16. Description Preparation Date:
1\6\2025
17.Available Attendance Forms:

18. Number of Credit Hours (Total) / Number of Units (Total)
3
19. Course administrator's name (mention all, if more than one name)
Name: Email: hajar.alkhalidy@ntu.edu.iq
20. Course Objectives

	This course aims to equip students with effective learning skills and technical knowledge in specialized fields such as Artificial Intelligence, Computer Networks, Data Security, Computer and Digital Logic, and Computer Architecture. By the end of this course, students will be able to: **1. Actively participate in learning activities that develop their analytical thinking, logical reasoning, and practical application of fundamental concepts in their field of study.** **2. Collaborate effectively within groups to solve complex problems, design systems, and present technical topics, enhancing teamwork and communication skills.** **3. Apply inquiry-based learning methods by formulating technical questions, conducting research, and performing experiments to explore and validate solutions.** **4. Understand and apply fundamental theoretical and practical concepts through**

	organized lectures and demonstrations. 5. Adapt to diverse learning styles and preferences by engaging in differentiated instruction tailored to meet individual student needs. 6. Utilize modern technological tools, such as simulators, programming environments, virtual labs, and educational software, to deepen understanding and foster interactive learning. 7. Integrate various teaching and learning methods to optimize knowledge acquisition and skill development, balancing theoretical and practical aspects.

21. Teaching and Learning Strategies

Strategy	Teaching and learning techniques are tools used by instructors to effectively deliver academic content and by students to acquire technical knowledge and skills. These methods are flexibly applied to specialized subjects such as Artificial Intelligence, Computer Networks, Data Security, Computer and Digital Logic, and Computer Architecture. Key techniques include: 1. Active Learning: Students are engaged in activities that require analysis, logical thinking, and practical application of concepts. These may include solving programming problems, developing technical projects, and analyzing real-world scenarios in cybersecurity or computer networking. 2. Collaborative Learning: Students work in groups to develop shared solutions for specific tasks such as designing a computer network, building an AI model, or presenting a topic on digital logic gates. This approach enhances teamwork and group interaction skills. 3. Inquiry-Based Learning: Students are encouraged to ask technical questions, conduct research, and discover solutions through experimentation and lab-based work. For example, testing a machine

	learning algorithm, analyzing a security vulnerability, or experimenting with logic circuits. **4. Direct Instruction: Lectures and demonstrations are used to present theoretical and practical concepts in a structured manner. This is especially effective in explaining the fundamentals of AI, computer architecture, or network protocols.** **5. Differentiated Instruction: Teaching is tailored to accommodate students' individual abilities and interests, whether they prefer programming tasks, theoretical analysis, or hands-on experimentation. This allows each student to learn in the way that suits them best.** **6. Technology-Based Instruction: Digital tools such as simulators, programming environments, virtual labs, and educational apps are used to demonstrate advanced concepts and engage students in interactive, practical learning experiences.** **7. Blended Methods: A combination of different techniques is often used, depending on the subject matter and students' needs—for example, integrating theoretical lectures with practical experiments, or mixing individual and group work—to achieve the best learning outcomes.**

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1 theory+ 2 lab	Computer security	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
2	1 theory+ 2 lab	Computer network	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
3	1 theory+ 2 lab	-AI definition, history, concept, and applications,	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams

4	1 theory+ 2 lab	- AI in our Daily lives - Challenges in AI - Future of AI	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
5	1 theory+ 2 lab	- AI in our Daily lives - Challenges in AI - Future of AI	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
6	1 theory+ 2 lab	Hardware: the structure of computer system, Input units, Output units ,Central processing units [CPU] , CPU components [ALU,RS,CU], CPU operations, Main memory, Primary storage, Type of main memory [RAM,ROM] ,	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
7		Mid term			
8	1 theory+ 2 lab	Instruction format with memory ,Secondary storage , Type of secondary storage , Software Programs and application programs and utilities, System software and operating system and utilities	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
9	1 theory+ 2 lab	introduction to computer architecture	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
10	1 theory+ 2 lab	STRUCTURE OF COMPUTERS (Computer types, Functional units, Basic operational	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams

		concepts, Architecture, Bus Structures, Software ,)			
11	1 theory+ 2 lab	STRUCTURE OF COMPUTERS (Performance, Multiprocessors and Multicomputer, Data representation, Fixed and Floating point, Error detection and correction codes)	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
12	1 theory+ 2 lab	K-map.	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
13	1 theory+ 2 lab	Combinational universal NAND and NOR logic.	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
14	1 theory+ 2 lab	4- bit parallel adder, and Subtract adder	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
15	1theory+ 2 lab	**Decoder, encoder**	The student understands the topic	Practical and Theoretical	Homework Assignments Reports Quiz Exams
23. 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					
24. Learning and Teaching Resources					

Required textbooks (curricular books, if any)	
Main references (sources)	The lectures prepared by the professor printed and distributed to the students.
Recommended books and references (scientific journals, reports…)	➢ William J. Dally and R. Curtis Harting, Digital Design: A Systems Approach, Cambridge University Press, 2012 ➢ Winston, P. H. (1992). *Artificial Intelligence* (3rd ed.), Addison-Wesley ➢ Peterson & Davie, *Computer Networks: A Systems Approach* ➢ *Introduction to Cybersecurity by Ajay Singh*
Electronic References, Websites	