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

Academic Program and Course Description Guide

Department of Artificial Intelligence and Robotics Engineering

2025-2026

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together 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 subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

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 of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They 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 (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Al-Iraqia University

Faculty/Institute: College of Engineering

Scientific Department: Department of Artificial Intelligence and Robotics Engineering

Academic or Professional Program Name: Bachelor's Degree in Artificial Intelligence and Robotics Engineering

Final Certificate Name: Bachelor's Degree in Artificial Intelligence and Robotics Engineering

Academic System: Semester System

Description Preparation Date:

File Completion Date:

Signature:

Head of Department Name:

Date: 9/8/2026

Signature:

Scientific Associate Name: Dr. Ahmed Hameed

Deputy Dean for Scientific Affairs

College of Engineering

Date: 9/8/2026

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

Prof. Dr. Nahla Abdul Razak

Approval of the Dean

Program Vision
To be a leading and distinguished department at the local, regional, and international levels in the fields of Artificial Intelligence, Robotics, and Intelligent Systems, through providing a high-quality academic program in accordance with national and international standards, preparing engineers equipped with knowledge, skills, and innovative capabilities, promoting scientific research, innovation, and entrepreneurship, and establishing effective partnerships with academic and industrial institutions in a manner that contributes to serving society and achieving sustainable development.

1. **Program Mission**
To prepare distinguished and creative engineers in the field of Artificial Intelligence and Robotics Engineering who possess a strong scientific and technical foundation and are capable of designing, developing, and implementing intelligent and robotic systems to meet the needs of the local, regional, and international labor markets. The program seeks to provide an educational and research environment that fosters creativity and innovation, promotes scientific research and lifelong learning, and establishes effective partnerships with academic and industrial institutions, thereby contributing to serving society, supporting sustainable development, and building a knowledge-based economy

2. **Program Objectives**
1. **Graduate specialized engineers** in Artificial Intelligence and Robotics Engineering who possess a strong scientific foundation and advanced theoretical and practical skills, and who are capable of innovation, critical

thinking, and solving engineering problems, thereby qualifying them to serve government institutions and the private sector and contribute to national development.

2. **Continuously develop the academic curricula** to keep pace with the rapid advancements in Artificial Intelligence, robotics, and intelligent systems, and seek academic accreditation in accordance with national and international standards, while providing an advanced educational environment that adopts the latest educational methods and technologies.
3. **Enhance scientific and applied research** in the fields of Artificial Intelligence, machine learning, robotics, and automation, and provide a supportive environment for researchers and students to conduct innovative research projects that contribute to addressing industrial and societal challenges.
4. **Prepare and qualify students** to design, develop, and implement intelligent and robotic systems in accordance with high standards of performance, reliability, and safety, while meeting the needs of industrial and service institutions.
5. **Establish effective scientific and practical partnerships** with universities, research centers, and local, regional, and international technology companies, contributing to the development of the educational process, providing training opportunities, enhancing research collaboration, and facilitating knowledge transfer.
6. **Align the academic program outcomes** with the needs of the local, regional, and international labor markets through continuous curriculum development, enhancement of practical training, and integration of applied projects with the

requirements of productive and service sectors.

7. **Develop students' teamwork, leadership, effective communication, and lifelong learning skills**, and encourage their participation in multidisciplinary projects to enhance their readiness to work in modern professional environments.
8. **Support a culture of innovation and entrepreneurship** by encouraging students and faculty members to develop entrepreneurial projects and intelligent technologies with economic and social impact, and to transform creative ideas into applicable solutions and products.
9. **Employ Artificial Intelligence and robotics technologies in serving society** by providing innovative technical solutions that contribute to the development of the health, agriculture, industry, energy, education, and government services sectors, thereby positively improving the quality of life.
10. **Provide a supportive academic environment** based on the principles of diversity, inclusion, and equal opportunities, while encouraging creativity, mutual respect, and collaboration among students and faculty members, thereby enhancing academic and research excellence.

3. Program Accreditation

No, the program is not currently accredited. As a newly established program, it began admitting students in the academic year **2025–2026**. The department is working to fulfill the requirements for program accreditation in accordance with the standards of the **Iraqi Council for Accreditation of Engineering Education**, in preparation for applying for accreditation upon meeting the required conditions and requirements.

4. Other external influences

There are currently no external sponsoring entities for the program. The department seeks to establish future partnerships with government institutions, the private sector, and companies operating in the fields of Artificial Intelligence, robotics, and information technology, in a manner that contributes to supporting the educational process, practical training, and scientific research.

5. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	**7**	**15**	**7.8%**	basic
College Requirements	**11**	**38**	**20%**	basic
Department Requirements	**39**	**78**	**72.2%**	basic
Summer Training	**1**	–	–	basic
Other				

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

6. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First Year/First Semester	COPR108	Computer and programming	**4**	**2**
First Year/First Semester	WORS109	Workshop		**2**
First Year/First Semester	PHYS104	Physics	**5**	
First Year/First Semester	ENGI105	Engineering Drawing		**2**
First Year/First Semester	MATH106	Mathematics I	**5**	
First Year/First Semester	CHEM107	Chemistry	**4**	
First Year/First Semester	ARLA101	Arabic Language I	**2**	
First Year/Second Semester	HRAD103	Human Rights & Democracy	**2**	
First Year/Second Semester	MATH122	Mathematics II	**5**	
First Year/Second Semester	DISD124	Digital System Design	**2**	**2**
First Year/Second Semester	MEEN125	Engineering Mechanics	**4**	

First Year/Second Semester	PYPR126	Python Programming	**3**	
First Year/Second Semester	ELCI127	Electrical Circuits	**3**	
First Year/Second Semester	ENLA102	English Language I	**2**	

7. Expected learning outcomes of the program

Knowledge

A-1 Ability to understand, identify, formulate, and solve fundamental and complex Artificial Intelligence and Robotics Engineering problems through the application of principles of engineering, science, mathematics, and computer science.

A-2 Ability to apply the engineering design process to produce intelligent solutions and robotic systems that meet specified needs, while considering public health, safety, and welfare, as well as global, cultural, environmental, social, economic, and other factors relevant to the specialization.

A-3 Ability to develop and conduct appropriate experiments, analyze and interpret data, and use engineering judgment to draw conclusions and evaluate the performance of intelligent and robotic systems.

Skills

B-1 Ability to communicate effectively with a wide range of audiences from different levels and sectors.

B-2 Ability to employ critical thinking, recognize the continuing need to acquire new knowledge, select appropriate learning strategies, and apply this knowledge.

B-3 Ability to work effectively with peers and colleagues in a collaborative and inclusive environment, as a member or leader of a team that establishes goals and plans tasks to achieve them.

Ethics

C- Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, while considering the impact of engineering solutions in the field of Artificial Intelligence and Robotics on global, economic, environmental, and societal contexts.

8. Teaching and Learning Strategies

The program adopts a variety of teaching and learning strategies, including explanation and clarification through face-to-face and electronic lectures, the use of modern educational resources, practical and laboratory applications, self-directed learning, project-based learning, homework assignments, summer

training, and scientific visits. These strategies contribute to developing students' knowledge and skills and achieving the targeted learning outcomes.

9. Evaluation methods

The program employs a variety of comprehensive assessment methods to measure the extent to which the intended learning outcomes are achieved. These include quizzes, homework assignments, midterm and final examinations, practical and laboratory applications, individual and group projects, scientific and technical reports, presentations, as well as the assessment of students' interaction and active participation in classrooms and laboratories.

10. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof. Dr. Mushtaq Ahmed Ali	Communications Engineering	Wireless Communications Engineering			Permanent Staff	
Asst. Prof. Dr. Duraid Yahya Mohammed	Computer Science	Pattern Recognition / Artificial Intelligence			Permanent Staff	
Asst. Prof. Dr. Omar Hussein Salman	Communications Engineering	Computer Systems Engineering			Permanent Staff	
Asst. Prof. Dr. Ahmed Latif Khalaf	Computer Engineering	Computer Engineering			Permanent Staff	
Asst. Prof. Dr. Anwar Qutaiba	Arabic Language	Arabic Language			Permanent Staff	

Yahya						
Lecturer Dr. Ahmed Sabah Noori	Electronics Engineering	Communications Engineering			Permanent Staff	
Lecturer Dr. Khalid Juma Kadhim	Mechatronics Engineering	Robotics Control			Permanent Staff	
Lecturer Dr. Wasan Saad Abduljabbar	Computer Engineering	Artificial Intelligence Engineering			Permanent Staff	
Assistant Lecturer Aya Iyad Hussein	Computer Communications Engineering	Computer Networks and Internet Technologies			Permanent Staff	
Assistant Lecturer Ali Adnan Hussein	Computer Communications Engineering	Wireless Communications Engineering			Permanent Staff	
Assistant Lecturer Muthanna Fakhri Shakir	Mechatronics Engineering	Mechatronics Engineering			Permanent Staff	

Professional Development

Mentoring new faculty members

The orientation process for new faculty members includes an introductory program covering the program's mission, vision, and objectives; university and departmental policies and procedures; quality assurance and academic accreditation mechanisms; teaching, learning, and assessment systems; as well as continuous academic and administrative support and guidance. This contributes to their effective integration and enhances their competence in performing their teaching, research, and community service responsibilities.

Professional development of faculty members

The program adopts a continuous professional development plan for faculty members through participation in training courses, workshops, seminars, and scientific conferences; encouraging scientific research and academic publication; exchanging academic expertise; and developing teaching and assessment skills and the use of modern technologies and Artificial Intelligence in

the educational process. This contributes to improving the quality of education, achieving the intended learning outcomes, and strengthening academic accreditation requirements.

11. Acceptance Criterion

Admission to the Artificial Intelligence and Robotics Engineering Program is conducted in accordance with the regulations and instructions of the Ministry of Higher Education and Scientific Research and the approved centralized admission system. For the academic year 2025–2026, the minimum admission score was 87%, and the approved admission capacity was 50 students. These figures are subject to annual updates in accordance with the Ministry's regulations and the admission capacity approved by the university.

12. The most important sources of information about the program

1. The official website of Aliraqia University, the College of Engineering, and the Department of Artificial Intelligence and Robotics Engineering.
2. Regulations and instructions issued by the Ministry of Higher Education and Scientific Research concerning engineering programs and quality assurance.
3. The guidelines and accreditation standards of the Iraqi Council for Accreditation of Engineering Education.
4. Official websites of relevant professional and scientific organizations, such as **IEEE** and **ACM**, as well as other scientific institutions specializing in Artificial Intelligence and robotics.
5. Academic guidelines and regulations of Aliraqia University and the College of Engineering.

6. Program Development Plan

1. **Needs Analysis**: Conduct periodic studies and surveys to identify the needs of

the labor market and industrial and technological sectors in the fields of Artificial Intelligence and robotics, and gather the opinions of students, faculty members, employers, and graduates to identify the program's strengths and opportunities for improvement.

2. **Curriculum Development:** Periodically review and develop the study plan and courses to keep pace with global scientific and technological developments in the fields of Artificial Intelligence and robotics, in alignment with labor market requirements and academic accreditation standards.
3. **Development of Teaching and Learning Methods:** Enhance the use of modern teaching strategies, project-based learning, practical laboratories, digital learning platforms, and specialized software to improve the effectiveness of the educational process.
4. **Enhancement of Practical Skills:** Develop students' practical skills through laboratory work, applied projects, summer training, scientific competitions, and activities that foster innovation, teamwork, and problem-solving skills.
5. **Development of the Educational Environment:** Improve the educational infrastructure, upgrade laboratories, equipment, and specialized software, and provide digital educational resources to support the quality of teaching and learning.
6. **Monitoring and Evaluation:** Establish periodic mechanisms for monitoring and evaluating program performance, analyzing student results, learning outcomes, and stakeholder feedback, and taking the necessary corrective and developmental actions to achieve continuous improvement.
7. **Strengthening Partnerships and Collaboration:** Expand cooperation with relevant universities, research centers, companies, and governmental and

private institutions to support practical training, scientific research, joint projects, and improve graduates' employment opportunities.

8. **Continuous Improvement:** Conduct periodic reviews of the academic program in light of evaluation results, technological developments, labor market requirements, and academic accreditation standards to ensure the sustainability of program quality and the achievement of its mission and objectives.

Program Skills Outline										
				Required program Learning outcomes						
Year/Level	Course Code	Course Name	Basic or optional	Knowledge			Skills			Ethics
				A1	A2	A3	B1	B2	B3	C1
First Year/First Semester	COPR108	Computer and programming	Basic	●						
	WORS109	Workshop	Basic					●		
	PHYS104	Physics	Basic	●			●			
	ENGI105	Engineering Drawing	Basic					●		
	MATH106	Mathematics I	Basic	●						
	CHEM107	Chemistry	Basic	●			●			
	ARLA101	Arabic Language I	Basic				●			
First Year/Second Semester	HRAD103	Human Rights & Democracy	Basic				●			
	MATH122	Mathematics II	Basic	●						
	DISD124	Digital System Design	Basic	●						
	MEEN125	Engineering Mechanics	Basic	●			●			
	PYPR126	Python Programming	Basic	●				●		
	ELCI127	Electrical Circuits	Basic	●						
	ENLA102	English Language I	Basic				●			

Course Description Form

1. Course Name:
Computer and programming
2. Course Code:
COPR108
3. Semester / Year:
2025/2026-1
4. Description Preparation Date:
12-7-2026
5. Available Attendance Forms:
Physical Classroom Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
3/45
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Lect. Marwah Mohammed Mosa Email: :marwah.m@aliraqia.edu.iq
8. Course Objectives

Course Objectives	This course provides a comprehensive introduction to computer fundamentals, digital hardware concepts, and structured programming using the C language. It aims to establish a strong foundation in computer engineering by integrating theoretical understanding of computer organization and components with practical programming skills. Students will learn how hardware components interact with software, how data is represented and processed within computer systems, and how to design, write, and execute C programs to efficiently solve engineering problems. The course emphasizes the development of logical thinking, algorithm design, structured programming techniques, problem analysis, and the creation of software solutions for engineering and practical applications. The main objectives of this course are to: 1. Provide students with a comprehensive understanding of computer systems, focusing on hardware components, their functions, and operational principles. 2. Develop students' understanding of the interaction between hardware and software,

	including how C programs are executed within computer systems. 3. Equip students with the fundamental knowledge and skills required to design, write, and implement structured programs using the C programming language. 4. Enhance students' logical and analytical thinking skills for effective problem-solving in computer engineering and computational applications. 5. Develop students' abilities in algorithm design and structured program development to produce efficient and reliable software solutions. 6. Develop practical skills in program testing, debugging, and documentation, particularly for applications related to computer hardware and engineering systems. 7. Enable students to apply programming concepts to design, develop, and implement complete programs for solving engineering and real-world problems. 8. Prepare students for advanced courses in programming, software engineering, embedded systems, and artificial intelligence applications by building a strong foundation in programming principles and computer systems.

9. Teaching and Learning Strategies

Strategy	This course adopts a variety of teaching and learning strategies aimed at developing students' theoretical knowledge, practical skills, computational thinking, and programming abilities. These strategies focus on active student engagement, practical application, and the integration of theoretical concepts with real-world programming practices. The adopted strategies include: 1. Interactive Lectures: Interactive lectures are used to explain fundamental concepts related to computer systems, programming, and algorithms. Students are encouraged to participate in classroom discussions, ask questions, and engage in problem-solving activities to enhance understanding and knowledge acquisition. 2. Hands-on Learning: Through practical laboratory sessions, students develop their programming skills by writing programs, implementing algorithms, testing solutions, debugging errors, and gaining practical experience in the C programming environment. 3. Problem-Based Learning:

	Students are provided with practical programming problems that require analysis, solution design, and algorithm development. This approach enhances their ability to apply computational thinking and develop effective solutions for engineering problems. 4. Project-Based Learning: Students complete small-scale programming projects that enable them to design and develop simple applications, apply modular programming principles, and connect theoretical knowledge with practical implementation. 5. Programming Assignments and Exercises: Regular assignments, individual and group programming exercises, and problem sets are assigned to reinforce course concepts, improve logical thinking, and develop problem-solving skills. 6. Collaborative Learning and Classroom Discussions: Students are encouraged to work collaboratively in groups, participate in code reviews, exchange ideas, and share different approaches to problem-solving. This strategy develops communication skills, teamwork, and critical thinking abilities. 7. Use of Digital Learning Resources: Digital tools, presentations, simulations, educational software, and modern programming environments are utilized to support learning and improve students' understanding of complex and abstract concepts. 8. Self-Directed Learning: Students are encouraged to explore electronic resources, programming documentation, supplementary learning materials, and additional exercises to promote continuous learning, independent exploration, and research skills. 9. Continuous Assessment and Feedback: Students' performance is continuously evaluated through assignments, exercises, laboratory activities, projects, quizzes, midterm, and final examinations. Constructive feedback is provided to help students improve their programming skills, analytical abilities, and overall academic performance.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2 hrs	Understand course objectives, computer fundamentals, and basic programming concepts	Course Orientation and Introduction to Computers and Programming Concepts	Interactive lecture + discussion	Attendance, participation, and class discussion

Week 2	2 hrs	Explain computer components and understand hardware–software interaction	Basic Computer Organization: Hardware Components and Software Interaction	Interactive lecture + examples	Assignment
Week 3	2 hrs	Develop computational thinking and problem-solving skills	Introduction to Algorithms and Problem Solving	Lecture + problem-based learning	Class exercises
Week 4	2 hrs	Design algorithms and represent solutions using flowcharts	Algorithms and Flowcharts: Visual Representation of Problem Solutions	Lecture + practical examples	Homework assignment
Week 5	2 hrs	Understand C programming structure, syntax, and development environment	Introduction to Programming in C: Syntax, Program Structure, and Tools	Interactive lecture + demonstrations	Quiz
Week 6	2 hrs	Apply variables, constants, data types, and input/output operations	Variables, Constants, Data Types, and Input/Output in C	Lecture + coding examples	Practical exercises
Week 7	2 hrs	Apply basic control structures in programming	Decision Making: Sequential, Conditional, and Iteration Structures	Lecture + problem-solving activities	Quiz
Week 8	2 hrs	Evaluate students' understanding of the first half of the course	Midterm Examination	Written examination	Midterm Exam
Week 9	2 hrs	Implement conditional statements to solve programming problems	Control Flow I: Conditional Statements (if, if–else)	Lecture + programming examples	Assignment
Week 10	2 hrs	Apply multiple decision structures in programs	Control Flow II: Nested if and Switch Statements	Lecture + practical examples	Quiz
Week 11	2 hrs	Understand and implement looping structures	Iteration I: While and Do-While Loops	Lecture + coding exercises	Class activities
Week 12	2 hrs	Develop programs using advanced loop structures	Iteration II: For Loops and Nested Loops	Lecture + problem-based learning	Assignment
Week	2 hrs	Combine	Advanced	Project-based	Project

13		programming concepts to develop applications	Applications of Loops and Mini-Project Development	learning	evaluation
Week 14	2 hrs	Apply structured programming techniques and debugging methods	Structured Programming, Debugging, and Testing	Lecture + code review	Practical assessment
Week 15	2 hrs	Understand the relationship between programming, AI, and robotics applications	Introduction to AI, Robotics, and C Programming Applications	Interactive lecture + discussion	Class presentation
Week 16	2 hrs	Review and consolidate course concepts before final assessment	Final Examination Preparation and Course Review	Revision session	Final review
Weekly Laboratory Syllabus					
Week	**Hours**	**Required Learning Outcomes**	**Unit / Lab Topic Title**	**Teaching Method**	**Assessment Method**
Week 1	2 hrs	Become familiar with the programming environment and computer hardware components	Lab 1: Laboratory Orientation, C Environment, and Computer Hardware Introduction	Hands-on training + demonstration	Attendance and practical participation
Week 2	2 hrs	Apply variable declaration, data types, and input/output operations	Lab 2: Variables Declaration and Input/Output Operations	Practical coding exercises	Lab report + code evaluation
Week 3	2 hrs	Write basic C programs and perform debugging	Lab 3: Writing the First C Program and Debugging Techniques	Hands-on learning + guided practice	Program evaluation
Week 4	2 hrs	Convert algorithms and flowcharts into executable programs	Lab 4: Translating Flowcharts into C Programs	Practical implementation	Programming assignment
Week 5	2 hrs	Apply conditional statements in programming solutions	Lab 5: Conditional Statements Practice (if, if–else)	Coding practice + problem solving	Practical quiz
Week 6	2 hrs	Implement multi-way decision	Lab 6: Switch-Case Statement	Hands-on exercises	Lab assessment

		structures using switch statements	Practice		
Week 7	2 hrs	Apply loop structures to solve repetitive problems	Lab 7: Loop Control Structures (For, While, Do-While)	Practical training	Lab report
Week 8	2 hrs	Develop programs using nested loops	Lab 8: Nested Loops Implementation	Problem-based learning	Practical evaluation
Week 9	2 hrs	Control loop execution using break and continue statements	Lab 9: Loop Control Statements (Break and Continue)	Coding exercises	Programming task
Week 10	2 hrs	Integrate programming concepts into a complete application and apply debugging skills	Lab 10: Mini Project Using Variables, Operators, Conditions, Loops, and Input/Output	Project-based learning + teamwork	Mini-project + final report

11.Course Evaluation

Assessment Type	Assessment Activity	Time / Number	Weight (Marks)	Week Due	Relevant Learning Outcomes
Formative Assessment	Quizzes	2 quizzes	10% (10 Marks)	Weeks 5 and 10	LO #3, LO #4, LO #6, LO #7, LO #9, LO #14
	Assignments	2 assignments	10% (10 Marks)	Weeks 2 and 12	LO #7, LO #8, LO #9, LO #10, LO #12, LO #14
	Project / Lab	1 Project or Laboratory Activity	10% (10 Marks)	Week 13	LO #6, LO #9, LO #11, LO #13
	Midterm Exam	2 hours	10% (10 Marks)	Week 7	LO #1 – LO #10
Summative Assessment	Final Exam	3 hours	50% (50 Marks)	Week 16	All Learning Outcomes (LO #1 – LO #14)
Total Assessment			100% (100 Marks)		

12.Learning and Teaching Resources

Required textbooks (curricular books, if any	1. Chouhan, S. S. (2023). *Computer Programming: Theory and Practicals*. Department of Computer Science and Engineering, Malaviya National Institute of Technology, Jaipur, Rajasthan. 2. Prinz, P., & Kirch-Prinz, U. (2002). *A Complete Guide to Programming in C*.

	Translated by I. Travis. Jones and Bartlett Publishers. ISBN: 0-7637-1817-3. 3. Deitel, P., & Deitel, H. (2016). *C: How to Program with an Introduction to C* (Global Edition, 8th ed.). Pearson Education Limited. ISBN: 978-1-292-10588-7.
Main references (sources)	1. Bryant, R. E., & O'Hallaron, D. R. *Computer Systems: A Programmer's Perspective*. Pearson Education. 2. Tanenbaum, A. S., & Austin, T. *Structured Computer Organization*. Pearson Education. 3. Scott, M. L. *Programming Language Pragmatics*. Morgan Kaufmann.
Recommended books and references (scientific journals, reports...)	1. Scientific articles and technical reports related to: o Computer Organization and Architecture. o Algorithm Design and Performance Analysis. o C Programming Applications in Engineering Systems and Embedded Systems. 2. Research papers published in scientific journals and conferences, including: o *IEEE Transactions on Computers*. o *ACM Computing Surveys*. o *IEEE Computer Magazine*.
Electronic References, Websites	1. **C Programming Language Reference and Documentation:** https://en.cppreference.com 2. **GeeksforGeeks – Programming and Algorithms Tutorials:** https://www.geeksforgeeks.org 3. **W3Schools – C Programming Tutorials:** https://www.w3schools.com/c 4. **TutorialsPoint – C Programming Tutorials:** https://www.tutorialspoint.com/cprogramming 5. **MIT OpenCourseWare – Computer Science Educational Materials:** https://ocw.mit.edu 6. **IEEE Xplore Digital Library – Scientific Research Database:**

	https://ieeexplore.ieee.org 7. **ACM Digital Library – Computing Research Publications:** https://dl.acm.org

Course Description Form

1. Course Name:
Technical workshop
2. Course Code:
WSP106
3. Semester / Year:
First Semster/ First year
4. Description Preparation Date:
1-6-2026
5. Available Attendance Forms:
Physically
6. Number of Credit Hours (Total) / Number of Units (Total)
2hrs/2Units
7. Course administrator's name (mention all, if more than one name)
Name: Ass. lec. Aws Abdulillah Hussein Email aws.a.hussein@aliraqia.iq

8. Course Objectives

Course Objectives	1.Identify all the pieces used in the computer and network industries 2.Check and test electronic parts used in computers and electronic devices. 3.Learn the Soldering and DE soldering processes and how to deal with destroyed parts.

9. 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.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Understanding and applying concepts for the technical workshop	Identifying the measuring devices available in the workshop and how they work	Lecture with practical application	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 2	2	Understanding and applying concepts for the technical workshop	Understanding the process of soldering electronic components in series	Lecture with practical application	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 3	2	Understanding and applying concepts for the technical workshop	Learn how to solder electronic components in parallel.	Lecture with practical application	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 4	2	Understanding and applying concepts for the technical workshop	Resistance: Types of resistors and how to calculate their values using several methods.	Lecture with practical application	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 5	2	Understanding and applying concepts for	Capacitor identification: Understanding capacitor types and charging/discharging methods	Lecture with practical application	Quizzes Assignments Projects Report

		the technical workshop			Midterm Exam Final Exam
Week 6	2	Understanding and applying concepts for the technical workshop	Silicon and germanium semiconductors	Lecture with practical application	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 7	2	Understanding and applying concepts for the technical workshop	Diode: How a diode works and how to incorporate it in electrical circuits	Lecture with practical application	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 8	2	Understanding and applying concepts for the technical workshop	Applications of diode operation and rectifier circuits	Lecture with practical application	Quizzes Assignments Projects Report Final Exam
Week 9	2	Understanding and applying concepts for the technical workshop	Zener diode: how it works and how it's connected in electrical circuits	Lecture with practical application	Quizzes Assignments Projects Report Final Exam
Week 10	2	Understanding and applying concepts for the technical workshop	Applications of Zener diode operation	Lecture with practical application	Quizzes Assignments Projects Report Final Exam
Week 11	2	Understanding and applying concepts for the technical workshop	LED types and applications	Lecture with practical application	Quizzes Assignments Projects Report Final Exam

11. Course Evaluation

Quizzes 10% (10)
Assignments 10% (10)
Projects 10% (10)
Report 10% (10)
Midterm Exam
10% (10)
Final Exam
50% (50)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	• Technical workshop (Materials & Devices) authored by Assist. Lecturer Mazin N. Ali supervised by Prof. Mohammed H. Hafiz

	Dean of college of engineering.
Main references (sources)	● Electrical & Electronics Engineering, Amrita School of Engineering, 2014
Recommended books and references (scientific journals, reports…)	● Electronics Workshop Lab Man Polytechnic, Bilaspur, 2010

Course Description Form

13. Course Name:
Physics
14. Course Code: /
PHYS104
15. Semester / Year:
Semester 1, 2025–2026
16. Description Preparation Date:
19/10/2025
17.Available Attendance Forms:
In class
18.Number of Credit Hours (Total) / Number of Units (Total)
4 hours Theoretical + 1 hour Tutorials per week / 65 hours total
19. Course administrator's name (mention all, if more than one name)
Name: Lec. Dr. Khalid J. Kazim

Email: khalidjkazim@aliraqia.edu.iq

20. Course Objectives

Course Objectives	• Understand and analyze classical mechanics and thermodynamics. • Solve quantitative physics problems relevant to engineering systems.

21. Teaching and Learning Strategies

Strat

1. Guided lectures and classroom discussions.
2. Interactive learning through pair work and group activities.
3. Practical applications to develop reading, writing, listening, and speaking skills.
4. Utilization of multimedia and language learning resources to support t educational process.
5. Continuous assessment through quizzes, assignments, class participation, and feedback.
6. Promoting self-directed learning through homework and independ study activities.

22. Course Structure

W	Hours		Unit or subject name	Learning method	Evaluation method
1	4		Introduction to Phys Units, and Measuremer	In class	In class activities
2	4		Vectors and Scal Components, Addit and Dot Product	In class	In class activities and home dutie
3	4		Forces and Equilibri Newton's Laws and I Body Diagrams	In class	In class activities

4	4		Moments, Couples, Center of Gravity	In class	In class activities
5	4		Friction and Applicat in Static Systems	In class	In class activities
6	4		Work, Energy, and Po in Mechanical Systems		In class activities and home dutie
7	4		Introduction Thermodynamics Systems	In class	
8			Midterm Exam		In class activities and home dutie
9	4		Zeroth Law Temperature Measuren	In class	Home duties and reports
10	4		First Law Thermodynamics Energy Transfer	In class	Mid Term
11	4		Work and Heat in Clo Systems		Questions during the lecture
12			Second Law Thermodynamics and H Engines	Mid Term	Home duties and questions du the lecture
13	4		Entropy Reversible/Irreversible Processes	In class	Mid Term
14	4		Review Lecture	In class	In class activities
15			Final Exam	In class	In class activities

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 (curricu books, if any)	- Halliday, Resnick, Walker — Fundamentals of Physics
Main references (sources)	- Tipler & Mosca — Physics for Scientists and Engineers
Recommended books and references (scientific journals, reports…)	Recommended References: - Serway & Jewett — Physics for Scientists & Engineers - Scientific journals, online resources, and simulation tools.
Electronic References, Websit	

Course Description Form

25. Course Name:
Engineering Drawing
26. Course Code:
ENGI105
27. Semester / Year:
First semester/ first year
28. Description Preparation Date:
23/2/2026
29.Available Attendance Forms:
In−person
30.Number of Credit Hours (Total) / Number of Units (Total)
30 hours/ 2 ECTS
31. Course administrator's name (mention all, if more than one name)
Name: Ahmed Sabah Noori

Email: ahmedsabahnoori@aliraqia.edu.iq

32. Course Objectives

Course Objectives	• Develop students' understanding of the fundamental principles, standards, and conventions of engineering drawing. • Enable students to produce accurate engineering drawings using standard drawing instruments and proper drafting techniques. • Develop students' skills in geometric constructions and engineering dimensioning according to standard drawing practices. • Develop students' ability to construct and interpret orthographic projections and sectional views. • Develop students' ability to construct and interpret isometric drawings of engineering objects. • Enhance students' precision, spatial visualization, and technical communication skills through engineering drawing practice.

33. Teaching and Learning Strategies

Strategy	1. Interactive lectures to explain engineering drawing principles, standards, and conventions. 2. Step-by-step board demonstrations using engineering drawing instruments. 3. Hands-on drawing practice using drawing sheets and standard engineering drawing tools. 4. Individual classroom exercises to develop drawing accuracy and visualization skills. 5. Continuous formative assessment through drawing assignments, quizzes, classroom activities, and homework. 6. Constructive feedback to improve students' drawing techniques, accuracy, and presentation.

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Identify drawing standards and instruments.	Introduction to Engineering Drawing and Drawing Instruments	Interactive Lecture, Board Demonstration	Classroom Participation
2	2	Apply line types and lettering conventions.	Line Types and Lettering	Lecture, Drawing Practice	Quiz, Drawing Exercise
3	2	Construct basic geometric shapes accurately.	Geometric Constructions	Board Demonstration, Practical Drawing	Assignment
4	2	Apply engineering dimensioning rules.	Dimensioning	Lecture, Practical Drawing	Drawing Exercise
5	2	Construct orthographic projections.	Introduction to Orthographic Projection	Interactive Lecture, Practical Drawing	Quiz
6	2	Produce multiview orthographic drawings.	Orthographic Projection Applications	Practical Drawing	Assignment
7	2	Construct sectional views.	Sectional Views	Board Demonstration, Practical Drawing	Drawing Assignment

8	2	Interpret sectional drawings.	Applications of Sectional Views	Practical Drawing	Quiz
9	2	Demonstrate first-half learning outcomes.	Midterm Examination	Written/Drawing Examination	Midterm Exam
10	2	Understand isometric projection.	Introduction to Isometric Projection	Interactive Lecture	Classroom Activities
11	2	Draw isometric views.	Isometric Drawing	Practical Drawing	Drawing Assignment
12	2	Produce isometric drawings.	Isometric Drawing Applications	Practical Drawing	Quiz
13	2	Solve integrated drawing exercises.	Comprehensive Drawing Exercises	Practical Drawing	Assignment
14	2	Complete engineering drawings accurately.	Drawing Practice and Problem Solving	Practical Drawing	Practical Assessment
15	2	Review all course topics.	Comprehensive Course Review	Revision Session	Continuous Assessment

35. 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

36. Learning and Teaching Resources

Required textbooks (curricular books, if any	Simmons, C. H., & Maguire, D. E. (2012). Manual of Engineering Drawing: Technical Product Specification and Documentation to British and International Standards (4th ed.). Elsevier.
Main references (sources)	• Simmons, C. H., & Maguire, D. E. Manua Engineering Drawing. Elsevier. • French, T. E., Vierck, C. J., & Foster, R. Engineering Drawing and Graphic Technol McGraw-Hill.
Recommended books and references (scientific journals, reports...)	• Bertoline, G. R., Wiebe, E. N., Miller, C. L., & Mohler, J. L. Technical Graphics Communication. McGraw-Hill. • Luzadder, W. J., & Duff, J. M. Fundamentals of Engineering Drawing. Prentice Hall.
Electronic References, Websites	• American Society of Mechanical Engineers (ASME)

	https://www.asme.org • Autodesk – Engineering Design Resources https://www.autodesk.com

Course Description Form

37. Course Name:
Chemistry
38. Course Code:
CHIM107
39. Semester / Year:
First Semester/ First year
40. Description Preparation Date:
1-2-2026
41.Available Attendance Forms:
In-person
42.Number of Credit Hours (Total) / Number of Units (Total)
4hrs/4Units
43. Course administrator's name (mention all, if more than one name)
Name: Dr. Bilal Ayed Wasmi Email: bilal.ayed@aliraqia.edu.iq
44. Course Objectives

Course Objectives	1. Explain the fundamental concepts of chemistry relevant to engineering applications, and describe their significance in various engineering fields. 2. Analyze how chemical principles support the selection and use of materials in robotic systems and AI applications, and explain how material properties influence performance and efficiency. 3. Apply chemical principles to solve practical engineering problems and propose sustainable solutions based on the principles of green chemistry while considering environmental and economic aspects.

45. Teaching and Learning Strategies

Strategy	➢ Utilize Visual teaching methods: Use presentation, diagrams, charts, pictures and tables to visualize complex concepts. This can assist in better understanding structures, reactions, and processes. ➢ Practice Problem-Solving: Engineering chemistry involves a lot of problem-solving. Work through problems practice different types of chemical calculations. ➢ Study Regularly and engage in group study: Create a study schedule that allows reviewing material consistently. Study with classmates to discuss concepts and work through problems together. ➢ Utilize Online Resources: Take advantage of online lectures, tutorials, and educational videos. ➢ Read the Textbook Thoroughly: Focus on the textbook during study sessions. Highlight important points, and summarize chapters to reinforce your understanding. ➢ Connect Chemistry to Engineering Applications: Understand how chemistry principles apply to engineering problems. ➢ Ask Questions: Don't hesitate to seek help from lecturer or peers when you have questions or struggle with a topic. Engaging in class discussions can also clarify concepts. ➢ Stay Organized: Keep track of assignments, deadlines, and exam dates. ➢ Seek Feedback: After assignments and exams, review feedback carefully to understand what you did well and where you can improve.

46. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	**4**	To understand the importance of chemistry in engineering and the basic concepts of chemistry. Additionally, gaining knowledge on how chemistry plays a role in AI and Robotics.	Introduction to Engineering Chemistry	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 2	**4**	To understand how to read the periodic table, type of elements, and their physical and chemical	Periodic table of elements.	Lectures	Quizzes Assignments Projects

		properties			Report Midterm Exam Final Exam
Week 3	**4**	To understand the chemical bonds, to be able to differentiate between the different types of chemical bonds, and the properties of each bond	Chemical Bonds	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 4	**4**	To understand what is the difference between pure substance and mixture, types of mixtures, their properties and separation methods	Pure Substance and Mixtures	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 5	**4**	Understanding the types of chemical reactions, reactions behaviors and what are reaction indications.	Chemical Reactions and Reaction Stoichiometry	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 6	**4**	Understanding chemical reaction stoichiometry, including mole concept, limiting reactants, and yield percent	Chemical Reactions and Reaction Stoichiometry	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 7	**4**	Exploring the main types of materials, their properties, their advantages and disadvantages as well as their applications	Materials Chemistry	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 8	**4**	Midterm Exam			
Week 9	**4**	Understanding the concepts of smart materials, functional types and their properties.	Smart materials	Lectures	Quizzes Assignments Projects Report Final Exam
Week 10	**4**	Exploring the main types of smart materials, their properties, as well as their applications	Smart materials	Lectures	Quizzes Assignments Projects Report Final Exam
Week 11	**4**	Understanding the basics of electrochemistry, its terminologies, types of electrochemical cells, types of batteries.	Electrochemistry	Lectures	Quizzes Assignments Projects Report Final Exam
Week 12	**4**	Understanding the theory of corrosion, the main factors influencing corrosion.	Corrosion	Lectures	Quizzes Assignments Projects Report Final Exam
Week 13	**4**	Exploring the types of corrosion and the prevention methods	Corrosion	Lectures	Quizzes Assignments Projects Report Final Exam
Week 14	**4**	Understanding the basic concepts	Green Chemistry	Lectures	Quizzes

		of green chemistry, its twelve principles, and exploring the application of green chemistry.			Assignments Projects Report Final Exam

47. Course Evaluation

Quizzes 10% (10)
Assignments 10% (10)
Group Work/Project 10% (10)
Report 10% (10)
Midterm Exam
10% (10)
Final Exam
50% (50)

48. Learning and Teaching Resources

Required textbooks (curricular books any)	• **General Chemistry: Principles and Modern Applications"** (11th Ed.) – *Petrucci, Herring, Madura, Bissonnette,2012.* • **Chemistry: The Central Science"** (14th Ed.) – *Brown, LeMay, Bursten, Murphy, Woodward, Stoltzfu. 2023*
Main references (sources)	• **Chemistry: The Central Science"** (14th Ed.) – *Brown, LeMay, Bursten, Murphy, Woodward, Stoltzfu. 2023*
Recommended books and references (scientific journals, reports…)	• **Essentials of General Chemistry** by D.D. Ebbing, S.D. Gammon, and R.O. Ragsdale,2003, Houghton Mifflin Company, New York. • Raymond Chang, **General Chemistry**, McGraw Hill 9th ed., 2007 • **Green Chemistry: An Introductory Text**, By Mike Lancaster, 2020.
Electronic References, Websites	https://chem.libretexts.org/ https://openstax.org/details/books/chemistry-2e?Student%20resources https://www.khanacademy.org/science/chemistry/chemical-bonds https://open.umn.edu/opentextbooks/textbooks/22

Course Description Form

49.	Course Name:
	Arabic Language I
50.	Course Code:
	ARLA101
51.	Semester / Year:
	2 Semester 1/ First year
52.	Description Preparation Date:
	24-6-2026
53.Available Attendance Forms:	
	In-person
54.Number of Credit Hours (Total) / Number of Units (Total)	
	2hrs./2Units
55.	Course administrator's name (mention all, if more than one name)
	Name: Ass. Prof. ANWAR QUTAIBA YAHYA Email: anwar.q.yahya@aliraqia.edu.iq
56.	Course Objectives

Course Objectives	**1. – Arabic is a means of communication; it carries a message between speakers. For this message to be clear and understandable, its vocabulary must be arranged according to the grammatical structure of the language. Hence, the necessity of teaching grammar in all languages becomes evident.** **2– Students learn writing and expression skills and identify errors to correct pronunciation.** **3– They master correct writing skills by learning spelling rules, especially common mistakes.** **4– They preserve the Arabic language as the language of the Holy Quran.** **5– They learn the fundamental principles of the Arabic language by developing writing, expression, and conversation skills.**

57. 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.

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Understand and apply Arabic grammar rules and appreciate literary texts.	*Surat Al-Hajj*; Punctuation Marks	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 2	2	Understand and apply Arabic grammar rules and appreciate literary texts	*Surat Al-Baqarah*; Morphological Pattern (Word Scale)	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam

Week 3	2	Understand and apply Arabic grammar rules and appreciate literary texts	Types of Hamza; A Noble Prophetic Hadith	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 4	2	Understand and apply Arabic grammar rules and appreciate literary texts	Parts of Speech; Solar and Lunar "Lam"	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 5	2	Understand and apply Arabic grammar rules and appreciate literary texts	Inflection (I'rab) and Structure (Bina'); "My School Methodology: Vision and Foundation"	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 6	2	Understand and apply Arabic grammar rules and appreciate literary texts	Types of Plurals; The Poet Ibn Al-Rumi	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 7	2	Understand and apply Arabic grammar rules and appreciate literary texts	Assigning Verbs to Pronouns; The Poet Antarah ibn Shaddad	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
Week 8	2	Understand and apply Arabic grammar rules and appreciate literary texts	Verb Conjugation	Lectures	Quizzes Assignments Projects Report Final Exam
Week 9	2	Understand and apply Arabic grammar rules and appreciate literary texts	Inflection (I'rab) and Structure (Bina'); Lexicographical Schools	Lectures	Quizzes Assignments Projects Report Final Exam
Week 10	2	Understand and apply Arabic grammar rules and appreciate literary texts	Subject and Predicate (Al-Mubtada' and Al-Khabar); Human Values in Pre-Islamic Poetry	Lectures	Quizzes Assignments Projects Report Final Exam
Week 11	2	Understand and apply Arabic grammar rules and appreciate literary texts	*Kana* and Its Sisters; Islam and Poetry	Lectures	Quizzes Assignments Projects Report Final Exam
Week 12	2	Understand and apply Arabic grammar rules	*Inna* and Its Sisters; Cases of Opening and Breaking the Hamza of *Inna*	Lectures	Quizzes Assignments

		and appreciate literary texts			Projects Report Final Exam
Week 13	2	Understand and apply Arabic grammar rules and appreciate literary texts	Deputy Subject (Passive Agent); Poetic Selections	Lectures	Quizzes Assignments Projects Report Final Exam
Week 14 &15	2	Understand and apply Arabic grammar rules, appreciate literary texts, and correctly use punctuation and oral expression in Standard Arabic.	Poets of the Mu‘allaqat Common Linguistic Errors	Lectures	Quizzes Assignments Projects Report Final Exam

59. Course Evaluation

Quizzes 10% (10)
Assignments 10% (10)
Projects 10% (10)
Report 10% (10)
Midterm Exam
10% (10)
Final Exam
50% (50)

60. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	• *Alfiyyah Ibn Malik* and its Commentaries. • *Sharh Ibn Aqil* (Ibn Aqil’s Commentary on the Alfiyyah). • *Jami‘ al-Durus al-‘Arabiyyah* (The Comprehensive Arabic Lessons). • *Dala’il al-I‘jaz* (The Proofs of Eloquence). • Poetry collections (Diwans) of Al-Mutanabbi, Muhammad Mahdi Al-Jawahiri, Ibn al-Farid, Badr Shakir al-Sayyab, and Abu al-Ala al-Ma'arri.
Recommended books and references (scientific journals, reports…)	• *Arabic Grammar: Rules and Meanings*. • *A Concise Guide to the Arabic Language for Non-Specialists*. • *Jawahir al-Balaghah* (The Jewels of Rhetoric). • *A Study of Spelling Rules*. • *A Concise Guide to Spelling and*

	Composition Rules.
Electronic References, Websites	Https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering

Course Description Form

1. Course Name:
Human Rights & Democracy
2. Course Code:
HRAD103
3. Semester / Year
Annual System / First Phase
4. Description Preparation Date:
14/4 /2026
5. Available Attendance Forms:
In–person
6. Number of Credit Hours (Total) / Number of Units (Total)
2hrs./2Units
7. Course administrator's name (mention all, if more than one name)
Name: Abulrahman Mohammed

Email: mohammed.bd.ali@aliragia.edu.iq

8. Course Objectives

Course Objectives	**As illustrated below .**

General goal //

The importance of human rights revolves around guaranteeing their rights in society, preserving their dignity and ensuring their living at a high standard away from injustice and greed from those of high status.

Special (Behavioral) goals //

1- Every person in life deserves to live in safety and peace.
2- The abolition of slavery to any person who exists in society, whether that person is of high status or an ordinary person.
3- Human rights have made all persons subject to the principle of equality before the law.
4- This equality has brought all persons to the law because of the justice provided by human rights that exist throughout the world.
5- Justice can be used if a person is subjected to any kind of injustice in society.

9. Teaching and Learning Strategies

Strategy	Brainstorming strategy Modeling learning strategy Group work or cooperative learning strategy Discussion strategy Project strategy A strategy for problem solving or problem-based learning Story strategy. Combining different strategies

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-	2	Knowledge of the law	Definition of the law	Interactive Lecture	Oral and

					written Examination
2-	2	Know what the right to protection is	The concept of right	Interactive Lecture	Oral and written Examination
3-	2	Knowing the sacred right of man that cannot be violated	The concept of human right	Interactive Lecture	Oral and written Examination
4-	2	Stages of human rights development	The historical development of the idea of human rights	Interactive Lecture	Oral and written Examination
5-	2	Knowledge of human rights in the Renaissance and modern times	The idea of human rights in the Renaissance and the modern era	Interactive Lecture	Oral and written Examination
6-	2	Replay of the month's lectures	Review	Interactive Lecture	Oral and written Examination
7-	2	Knowing the protection provided by Islamic laws	The idea of human rights in Islamic laws	Interactive Lecture	Oral and written Examination
8-	2	The development of thought and its impact on the development of human rights	Intellectual contribution to the development of human rights	Interactive Lecture	Oral and written Examination
9-	2	Knowing the role of philosophical thought in the development of human rights	Intellectual and philosophical contribution to the Renaissance and the early modern era	Interactive Lecture	Oral and written Examination
10-	2	Quick replay of the month's lectures	Review	Interactive Lecture	Oral and written Examination
11-	2	Knowing the position of the international world on freedoms	Types of public rights and freedoms and the position of some international conventions	Interactive Lecture	Oral and written Examination
12-	2	Find out how constitutions dealt with rights and freedoms	Some comparative and Arabic constitutions	Interactive Lecture	Oral and written Examination
13-	2	Knowledge of	Economic freedoms	Interactive Lecture	Oral and

		economic and social rights and freedoms	and social rights		written Examination
14-	2	A quick review of the entire curriculum	Comprehensive review	Interactive Lecture	Oral and written Examination
15-	2	A test to know the student's level of understanding of the curriculum	Oral selection	Interactive Lecture	Oral and written Examination

11. Course Evaluation

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

Daily Preparation	Daily Exam	Oral Exam	Report	Monthly Exam	Written Exam	Total
5	5	5	5	20	60	100

12. Learning and Teaching Resources

Required textbooks (curricular bool if any)	1- Islamic Perspectives on Human Rights 2- The Book of Sectarianism in Islam Sayyid Muhammad Sadiq Al-Sadr 3- College Library 4. Internet
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Virtual court
Electronic References, Websites	Browse the Google network using the desired subject key.

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Course Description Form

61.	Course Name:
	Math II
62.	Course Code:
	MATH122
63.	Semester / Year:
	First year/ Semester 2
64.	Description Preparation Date:
	23/7/2026
65.	Available Attendance Forms:
	In class
66.	Number of Credit Hours (Total) / Number of Units (Total)
	3 Theoretical + 2 Tutorial per week 75 hr
67.	Course administrator's name (mention all, if more than one name)
	Name: Assist. Prof. Dr. Ahmed L. Khalaf Email: ahmed.l.khalaf@aliraqia.edu.iq

68. Course Objectives

Course Objectives	The objective of this course is to develop an understandin the basic ideas of mathematics encountered in engineer Focus will be on the methods for understanding com numbers and fundamentals of the derivative and integratio inverse trigonometric functions. Students will learn some spe integration techniques (Integration by part, partial fraction, substitution) that are useful for the understanding of diffe engineering subjects. Another objective is to teach Engineering student about integration applications such as A under curve and volume. Finally, the student will learn concept of polar coordinates and its application.

69. Teaching and Learning Strategies

Strategy	To achieve the module outcomes, the following strategies will be used: 1. Lectures and Tutorials – to introduce theoretical concepts and worked examples. 2. Problem-Based Learning (PBL) – to encourage analytical and critical thinking. 3. Group Discussions and Peer Learning – to enhance teamwork and communication skills. 4. Assignments and Quizzes – to assess ongoing understanding and application of key topics. 5. Midterm and Final Exams – to measure cumulative knowledge and problem-solving skills

70. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	5	Explore and apply complex numbers — including powers, roots, and exponential forms — to model and solve engineering problems.	Fundamental Concepts of complex numbers.	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework / Assignment discussions.	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 2	5	Explore and apply complex numbers — including powers, roots, and exponential forms — to model and solve engineering problems. .	Complex numbers properties-power and roots	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes.	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement

				• Homework / Assignment	and interaction in class.
Week 3	5	Compute determinants, eigenvalues, and eigenvectors, and interpret their significance in engineering and robotic transformations.	Introduction to Inverse Trigonometric function and their differentiation	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework / Assignment	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 4	5	Understand manipulate inv trigonometric functi their derivatives, integrals, and relate t to trigonometric funct in engineering analysis	Inverse Trigonometric function Integration	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework / Assignment	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 5	5	Utilize advanced methods of integration such as integration by parts, by substitution, partial fraction expansion, and power reduction formulas for trigonometric functions.	Methods of integration – Integration by Part and integration	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework / Assignment	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 6	5	Utilize advanced methods of integration such as integration by parts, by substitution, partial fraction expansion, and power reduction formulas for trigonometric functions..	Methods of integration – Integration using Partial fraction method	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework /	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction

				Assignment	in class.
Week 7			Mid-term Exam	•	•
Week 8	5	Utilize advanced methods of integration such as integration by parts, by substitution, partial fraction expansion, and power reduction formulas for trigonometric functions.	Methods of integration – Integration by substitution	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework / Assignment	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 9	5	Utilize advanced methods of integration such as integration by parts, by substitution, partial fraction expansion, and power reduction formulas for trigonometric functions.	Methods of integration – Powers of sine and cosine.	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. Homework / Assignment	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 10	5	Analyze and solve engineering problems involving the application of integration to determine areas between curves, volumes of revolution, and other physical quantities.	Integration applications – Area under curve and Area between two curves	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework / Assignment	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 11	5	Analyze and solve engineering problems involving the application of integration to determine areas between curves, volumes of revolution, and other physical quantities.	Integration applications – Area between two curves	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes.	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement

				• Homework / Assignment	and interaction in class.
Week 12	5	Analyze and solve engineering problems involving the application of integration to determine areas between curves, volumes of revolution, and other physical quantities.	Integration applications – Volume of solid using Disk and Washer methods	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework / Assignment	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 13	5	Understand and employ polar coordinates for curve representation, transformation, and application in robotics and control systems.	Introduction to polar coordinates and its properties	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework / Assignment	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 14	5	Understand and employ polar coordinates for curve representation, transformation, and application in robotics and control systems.	Integral applications using polar coordinates – Area and length of curve	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework / Assignment	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction in class.
Week 15	5	Understand and employ polar coordinates for curve representation, transformation, and application in robotics and control systems..	Integral applications using polar coordinates length of curve	• Delivering in-class lectures. • Brainstorming. • Inter-group thinking skills. (or Small group collaborative thinking) • Pop quizzes. • Homework /	• In-class open-ended questions. • Exams and tests. • Assignments. • Monitoring student engagement and interaction

				Assignment	in class.
Week 16			Preparatory week before the final Exam		

71. 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

72. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thomas Calculas. George B. Thomas,2018.
Main references (sources)	1. Calculus Early transcendentals, by Howard Anton, irl Bivens ,Stephen Davis 2. Thomas' Calculus Early Transcendentals, George Thomas, Maurice D. Weir, Joel Hass, Pearson, 2014.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

73. Course Name:	
Digital System Design	
74. Course Code:	
DISD124	
75. Semester / Year:	
1st level / Second semester	
76. Description Preparation Date:	
21 April 2026	
77. Available Attendance Forms:	
In class	
78. Number of Credit Hours (Total) / Number of Units (Total)	
/hr / 5 ECTS	
79. Course administrator's name (mention all, if more than one name)	
Name: Lec. Ali Adnan Hussein Email: ali.adnan@aliraqia.edu.iq	
80. Course Objectives	
Course Objectives	• Introduce students to digital systems, number systems, and logic operations. • Develop ability to analyze and design **combinational and sequential logic circuits.** • Teach **logic simplification** using Boolean algebra and Karnaugh maps. • Enable students to **design, simulate, and test** digital systems using theoretical calculations and software tools. • Implement logic gates, **combinational and sequential logic circuits** using HDL (VHDL/Verilog).
81. Teaching and Learning Strategies	
Strategy	**Learning and Teaching Strategies:** **1. Lecture-Based Teaching:** Clear, structured delivery with examples and visual aids**.** **2. Guided Class Discussions:** Simple questions and real-world scenarios to encourage engagement**.**

	3. Weekly Quizzes and Recap Activities: Short interactive quizzes to reinforce learning. **4. Group-Based Mini Assignments:** Basic collaborative tasks to apply concepts. **5. Visual Aids and Demonstrations:** Use of videos, infographics, and simple diagrams to explain key ideas.

82. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understanding and the ability to apply logical concepts of numbers.	**Introduction to Digital Systems and Number Systems**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	Open-Q&A Session During the Lecture
2	4	Understanding and the ability to apply logical concepts of numbers.	**Complements and Signed Numbers**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	Open-Q&A Session During the Lecture
3	4	Describe the characteristics .of logic gates	**Logic Gates and Binary Logic**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	In-Class Research to Find Solutions and Answer Specific Questions
4	4	Describe the characteristics .of logic gates	**Boolean Algebra and Simplification**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	In-Class Research to Find Solutions and Answer Specific Questions
5	4	Describe the characteristics .of logic gates	**Karnaugh Map Minimization**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	In-Class Research to Find Solutions and Answer Specific Questions

6	4	Understanding and the ability to apply logical concepts of .circuits	**Combinational Logic Design I**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	Open-Q&A Session During the Lecture
7	4	Understanding and the ability to apply logical concepts of .circuits	**Combinational Logic Design II**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	In-Class Research to Find Solutions and Answer Specific Questions
8	4	Understanding and the ability to apply logical concepts of .circuits	**Midterm Exam**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	
9	4	Understanding and the ability to apply logical concepts of numbers.	**Introduction to Sequential Logic**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	Open-Q&A Session During the Lecture
10	4	Understanding and the ability to apply logical concepts of .circuits	**Latches**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	In-Class Research to Find Solutions and Answer Specific Questions
11	4	Understanding and the ability to apply logical concepts of .circuits	**Flip-Flops**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	Open-Q&A Session During the Lecture
12	4	Understanding and the ability to apply logical concepts of .circuits	**Design and Analysis of Sequential Circuits**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning	In-Class Research to Find Solutions and Answer Specific Questions

				• Brainstorming	
13	4	Understanding and the ability to apply logical concepts of .circuits	**Sequential Circuit Example Designs**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	In-Class Research to Find Solutions and Answer Specific Questions
14	4	Understanding and the ability to apply logical concepts of .circuits	**Practical Integration and Troubleshooting**	• Classroom Lectures • Group-Based Strategic Thinking Skills) • Critical Thinking Strategy in Learning • Brainstorming	Open-Q&A Session During the Lecture
15	4		**Final Exam**		

83. 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

84. Learning and Teaching Resources

Required textbooks (curricular books, if ar	Digital Design: with an introduction to Verilog HDL by M. Morris Mano and Mechael D. Ciletti, 5th Edition, Pearson Education, 2013.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Thomas L. Floyd, Digital Fundamentals, 11th Edition, Pearson Prentice Hall, 2015.
Electronic References, Websites	https://onlinecourses.nptel.ac.in/noc21_ee39/ review

Course Description Form

1. Course Name:	
Engineering Mechanics	
2. Course Code: /	
MEEN125	
3. Semester / Year:	
Semester 2, 2025–2026	
4. Description Preparation Date:	
19/10/2025	
5. Available Attendance Forms:	
In class	
6. Number of Credit Hours (Total) / Number of Units (Total)	
125/5	
7. Course administrator's name (mention all, if more than one name)	
Name: Lec. Dr. Khalid J. Kazim Email: khalidjkazim@aliraqia.edu.iq	
8. Course Objectives	
Course Objectives	This module aims to provide Robotics Engineers with crucial foundation in Dynamics and Fluid Mechanics enabling students to: analyze and solve problems involving the motion (kinematics) and forces (kinetics of particles and rigid bodies using Newton's Laws, th Work–Energy Principle, and the Impulse–Momentum Principle; calculate the center of mass and analyze rigid body rotation using moments of inertia; understand the fundamentals of vibration (SHM); and

	finally, apply the principles of fluid mechanics to analyze fluid properties, fluid statics (pressure, buoyancy), and fluid dynamics (Continuity and Bernoulli equations) to solve for flow conditions in pipes, specifically relating these concepts to hydrauli pneumatic, and cooling systems used in robotics applications.
9. Teaching and Learning Strategies	
Strategy	1.In-Class Time (3 Hours/Week) The extended in-class time will be used to build analytical rigor and introduce complex fluid concepts. Lecture-Demonstration & Methodology (Approx. 2.5 hours): Dynamics: Focus on systematic problem-solving methodology. Introduce dynamic concepts (kinematics, work-energy, impulse-momentum) by demonstrating the process of selecting the correct coordinate system and applying the relevant governing equation for a given problem. Fluids: Focus on conceptual visualization. Use demonstrations (real or simulated) to illustrate abstract concepts like pressure variation, buoyancy, and the differences between laminar and turbulent flow. Derive and explain the physical meaning of the Continuity and Bernoulli equations. Application-Focused Problem Sessions (Approx. 1.5 hours): Implement Structured Group Work where students solve multi-step problems that integrate concepts (e.g., "Analyze the impulse and momentum transfer during a robotic gripper's impact" or "Calculate the velocity of fluid exiting a cooling nozzle"). Use mini-case studies directly related to robotics: e.g., analyzing the dynamics of a robotic arm during a rapid movement, or determining the power requirements for a hydraulic actuator. Encourage the use of computational checks (e.g., brief spreadsheet use) to verify analytical solutions, fostering confidence in complex numerical answers. 2. Tutorial Sessions (1 Hour/Week) The dedicated tutorial hour will be a focused setting for drilling analytical skills and addressing specific student confusion.

	Targeted Practice: The primary goal is mastery of core calculation techniques. Tutors guide students through solving challenging homework problems related to rotational dynamics, collisions, or the application of the Bernoulli equation. Conceptual Q&A: Dedicate time to clarifying difficult concepts like the difference between mass moment of inertia and centroid, or the physical significance of the Reynolds number. Use short, focused concept checks at the start of the session. FBD and System Definition Review: Provide rapid, constructive feedback on students' technique in setting up dynamic Free-Body Diagrams (FBDs) and properly defining control volumes for fluid problems, as these are the critical first steps in problem-solving. Peer Instruction: Facilitate students explaining one complex concept (e.g., general plane motion) or one problem solution to a small group of peers, reinforcing their own mastery.

10. Course Structure

W	Hours		Unit or subject name	Learning method	Evaluation method
1	4		Introduction to Dynamics – Concepts, motion types, coordinate systems	In class	In class activities
2	4		Kinematics of Particles – Rectilinear & curvilinear motion	In class	In class activities and home duties
3	4		Kinetics of Particles (Newton's Laws) – F = ma applications	In class	In class activities
4	4		Work–Energy Principle – Kinetic & potential energy, power	In class	In class activities
5	4		Impulse–Momentum Principle – Linear momentum, collisions	In class	In class activities
6	4		Systems of Particles – Mass center, linear & angular momentum		In class activities a home duties
7	4		Rigid Body Kinematics – Rotation about axes, plane motion	In class	
8			Rigid Body Kinetics – Moments of inertia, equations of motion		In class activities a home duties
9	4		Vibration Fundamentals – Simple harmonic motion (SHM)	In class	Home duties a reports

10	4		Introduction to Fluids – Fluid properties, pressure, density	In class	Mid Term
11	4		Fluid Statics – Pascal's law, buoyancy, manometry		Questions during lecture
12			Fluid Dynamics – Continuity & Bernoulli equations	Mid Term	Home duties a questions during lecture
13	4		Internal Flow & Losses – Reynolds number, laminar vs turbulent flow	In class	Mid Term
14	4		Applications in Robotics – Hydraulic & pneumatic actuation, cooling	In class	In class activities
15			Final Exam	In class	In class activities

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)	1. Hibbeler, R. C., Engineering Mechanics: Dynamics, 15th Ed. 2. Cengel, Y. A., & Cimbala, J. M., Fluid Mechanics: Fundamentals and Applications, 5th Ed.
Recommended books and references (scientific journals, reports…)	3. Halliday, D., Resnick, R., & Walker, J., Fundamentals of Physics, 12th Ed.
Electronic References, Website	

Course Description Form

85. Course Name:	
Python Programming	
86. Course Code:	
PYPR126	
87. Semester / Year:	
Second Semester / 2025-2026	
88. Description Preparation Date:	
15/6/2026	
89. Available Attendance Forms:	
Physical attendance at the university campus	
90. Number of Credit Hours (Total) / Number of Units (Total)	
Theory: 2 hours per week Tutorial: 1 hour per week Laboratory: 2 hours per week	
91. Course administrator's name (mention all, if more than one name)	
Name: Lect. Wasseem Nahi Ibrahem Email: wasseem.nahi@aliraqia.edu.iq	
92. Course Objectives	
Course Objectives	1. Introducing Python as the primary language for artificial intelligence and automation. 2. Students will master programming fundamentals, including data types, variables, control structures (loops and conditionals), and functions. It emphasizes the practical application of core data structures like lists, tuples, and dictionaries. 3. The course also introduces modular programming and essential libraries (e.g., NumPy for numerical computation), providing the critical software skills needed

	for future courses in machine learning, data analysis, and robotic control systems.

4. Teaching and Learning Strategies

Strategy	1. Lectures and Interactive Sessions: Delivering conceptual knowledge on Python programming, computer science fundamentals, AI model concepts, with active student participation and Q&A. 2. Demonstrations and Live Coding: Practical demonstrations of Python code, libraries, and AI frameworks to illustrate concept real-time and enhance understanding. 3. Hands-on Laboratory Sessions: Supervised exercises in programming labs to practice coding, data handling, visualization, AI model implementation using Python. 4. Problem-Solving Workshops: Structured exercises to develop logical thinking, algorithm design, and debugging sk reinforcing the application of Python in engineering and scientific contexts. 5. Project-Based Learning: Small individual or group projects integrating Python programming, data analysis, and concepts to develop problem-solving, teamwork, and project management skills. 6. Self-Directed Learning: Encouraging students to explore Python libraries, AI tools, and additional programm challenges beyond classroom instruction to foster independent learning. 7. Comparative Analysis Activities: Activities comparing Python and C programming constructs to enhance understanding programming paradigms and selection of appropriate techniques. 8. Assessment and Feedback: Regular formative assessments, quizzes, and code reviews with feedback to guide stu progress and reinforce learning outcomes. 9. Discussion and Reflection: Group discussions, peer reviews, and reflective activities to encourage critical think problem-solving strategies, and application of theoretical concepts to practical scenarios.

5. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theory 2 Practical	1	Course orientation and overview; Introduction to Python	on-campus (direct and indirect)	HomeWorks and Assignments
2	2 Theory 2 Practical	2	Basic Python Concepts: Variables, data types.	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
3	2 Theory	3	Functions in Python: What is	on-campus	HomeWorks,

	2 Practical		a Function Benefits, Defining, types, and how Functions work	(direct and indirect)	Assignments, and Quizzes
4	2 Theory 2 Practical	4	Python for Mathematics Applications (Basic Math Functions)	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
5	2 Theory 2 Practical	5	Conditional Statements (if, if-else, if-elif-else)	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
6	2 Theory 2 Practical	5	Loop Statements (while, for-in)	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
7	2 Theory 2 Practical	6	Python Libraries: Introduction to libraries, installing and importing library packages, and built-in functions.	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
8	2 Theory 2 Practical	Mid-Term Exam			
9	2 Theory 2 Practical	7	Introduction to Basic Data Handling with NumPy and Pandas	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
10	2 Theory 2 Practical	8	Visualizing Data with Matplotlib Creating simple charts and graphs to understand data.	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
11	2 Theory 2 Practical	9	Creating Classes in Python	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
12	2 Theory 2 Practical	10	Modular Programming in Python: how to organize code into modules	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
13	2 Theory 2 Practical	11	Error and Exception Handling in Python: Syntax Errors, Try and Except	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
14	2 Theory 2 Practical	12	Introduction to TensorFlow and Keras libraries	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes
15	2 Theory 2 Practical	13	Overview on AI Model Concepts (Data Splitting & Performance Metrics)	on-campus (direct and indirect)	HomeWorks, Assignments, and Quizzes

6. Course Evaluation

Quizzes: 10%
Homework: 10%
Laboratory: 10%
Project: 10%
Mid-Term Exam: 10%
Final Exam: 50%

7. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. Deitel P. and Deitel H. (2020). Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data and the Cloud. Pearson Education.

	2. Lutz, M. (2025), Learning Python: Powerful Object-Oriented Programming (6th edition), O'Reilly Media. 3. Halvorsen, H.-P. (2020), Python Programming, ISBN 978-82-691106-4-7.
Main references (sources)	Gaddis, T. (2023), Starting out with Python (6th edition), Pearson Education.
Recommended books and references (scientific journals, reports…)	OpenStax. (2024). Introduction to Python Programming, Rice University.
Electronic References, Websites	1. The official Python website is https://www.python.org/ 2. Code online with OneCompiler at https://onecompiler.com/python 3. Learn Python and code online with w3schools at https://www.w3schools.com/python/

Course Description Form

1. Course Name:	
Electrical Circuits	
2. Course Code:	
ELCI127	
3. Semester / Year:	
Second Semester / First Year	
4. Description Preparation Date:	
24-4-2026	
5. Available Attendance Forms:	
Physically	
6. Number of Credit Hours (Total) / Number of Units (Total)	
150 hrs / 6 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Hiba H.Kurdi Email: hiba.h.kurdi@aliraqia.edu.iq	
8. Course Objectives	
Course Objectives	1. Understand the fundamental principles of electric circuits, including voltage, current, resistance, and power, and explain their interrelationships as governed by Ohm's law. 2. Analyze and solve direct current (DC) circuits using systematic approaches such as series-parallel analysis, voltage division, and current division methods. 3. Apply Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL) to perform detailed analysis of complex DC networks. 4. Evaluate and compute the equivalent resistance of resistors in series and parallel connections to simplify multi-resistor configurations. 5. Employ advanced circuit analysis methods, including nodal and mesh analysis, to determine voltage, current, and power relationships within electrical circuits. 6. Apply key circuit theorems—such as

	Superposition, Thevenin's, and Norton's theorems—to simplify and analyze DC circuits for unknown parameters.

9. Teaching and Learning Strategies

Strategy	The implementation of this module will focus on promoting active student engagement and developing critical thinking skills. This will be achieved through a combination of classroom lectures, interactive tutorial sessions, and engaging, hands-on experiments designed to reinforce key concepts through practical application.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1.	3	Understand the basic concepts of electrical circuits, SI units, electric charge, current, voltage, power, and apply Ohm's law to solve simple DC circuit problems.	Basic concepts, systems of units, Electric charge, current, voltage, power and Ohm's law	Lectures	Quizzes Assignments Projects Report
2.	3	Apply Kirchhoff's Voltage Law (KVL) and Kirchhoff's Current Law (KCL) to analyze and solve series and parallel DC circuits.	Kirchhoff's Laws, Kirchhoff's Voltage Law, Kirchhoff's Current Law (Series dc Circuits and Parallel dc Circuits)		Midterm Exam Final Exam
3.	3	Convert delta (Δ) resistor networks into equivalent wye (Y) networks and vice versa to simplify DC circuit analysis.	Conversion of delta - connected resistance into an equivalent Wye connection & Vic versa	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
4.	3	Develop systematic circuit analysis skills by applying nodal analysis, mesh analysis, and the superposition theorem to solve complex DC circuits accurately.	Nodal Analysis and Mesh Analysis Superposition theorem and its application.	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
5.	3	Simplify complex electrical networks using Thevenin's and Norton's theorems, and determine the conditions required for maximum power transfer to a lo	Thevenin's and Norton's theorems and maximum power transfer theorem	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam

6.	3	Explain the principles of alternating current, interpret AC waveforms.	1. Definition and characteristics of alternating current. 2. Generation and waveform representation of AC.	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
7.	3	evaluate RMS and average values for practical electrical applications.	Relationships and definitions of RMS value, average value, and their significance	Lectures	Quizzes Assignments Projects Report Midterm Exam Final Exam
8.	3		**Mid-Exam**		
9.	3	Analyze alternating current (AC) circuits using phasor techniques and impedance concepts to determine circuit voltages, currents, and power.	Analyses of Alternating Current Circuits	Lectures	Quizzes Assignments Projects Report Final Exam
10.	3	Interpret phasor relationships and analyze voltage–current behavior in pure resistive, inductive, and capacitive AC circuits.	Phasor Relationships for AC Circuit Elements, voltage and current relations in pure resistive inductive and capacitive circuits.	Lectures	Quizzes Assignments Projects Report Final Exam
11.	3	Evaluate the behavior of series and parallel AC circuits by calculating equivalent impedance and predicting voltage and current distribution.	Series and Parallel Configuration in AC Circuit	Lectures	Quizzes Assignments Projects Report Final Exam

12.	3	Apply network theorems, including Superposition, Thevenin's, and Norton's theorems, to simplify and analyze AC circuits efficiently.	Network Theorems in AC circuits, Superposition, Thevenin's Theorem, Norton's Theorem.	Lectures	Quizzes Assignments Projects Report Final Exam
13.	3	Evaluate power in AC circuits by calculating average power, apparent power, reactive power, and power factor to assess circuit performance and efficiency.	Power in AC circuits, Average power and power factor, Power Factor.	Lectures	Quizzes Assignments Projects Report
14.	3	Differentiate between apparent, reactive, and real power, and evaluate their roles in the performance of AC circuits.	Apparent power, Reactive Power	Lectures	Quizzes Assignments Projects Report Final Exam
15.	3	Analyze complex power and interpret the power triangle to determine the relationships among real, reactive, and apparent power in AC circuits.	complex power and power triangle	Lectures	Quizzes Assignments Projects Report Final Exam

11. Course Evaluation

Quizzes 10% (10)
Lab. 10% (10)
Projects 10% (10)
Seminar 10% (10)
Midterm Exam 10% (10)
Final Exam 50% (50)

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Introductory circuit Analysis; by Robert L. Boylestad
Main references (sources)	Sadiku, Matthew NO, and Charles K. Alexander. Fundamentals of electric circuits. New York: McGraw-Hill, 2009.
Recommended books and references (scientific journals, reports...)	Lecture notes of Electrical circuits AI Engineering Department, Al-Iraqia University. .
Electronic References, Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering

Course Description Form

93. Course Name:
English Language I
94. Course Code:

ENLA102
95. Semester / Year:
second semester/ first year
96. Description Preparation Date:
23/2/2026
97.Available Attendance Forms:
In-person
98.Number of Credit Hours (Total) / Number of Units (Total)
30 hours/ 2 ECTS
99. Course administrator's name (mention all, if more than one name)
Name: Ahmed Sabah Noori Email: ahmedsabahnoori@aliraqia.edu.iq

100. Course Objectives	
Course Objectives	• Develop students' proficiency in the four English language skills: reading, writing, listening, and speaking. • Improve students' grammar, vocabulary, pronunciation, and comprehension for effective communication. • Enable students to communicate confidently in academic and everyday situations. • Develop students' ability to read and understand basic academic and technical texts. • Encourage independent learning and the effective use of English language resources. • Introduce students to basic English terminology related to engineering and technology.

101. Teaching and Learning Strategies	
Strategy	1. Lectures and guided classroom discussions. 2. Interactive learning through pair work and group activities. 3. Practical exercises for reading, writing, listening, and speaking skills. 4. Use of multimedia and language learning resources to support classroom instruction. 5. Continuous assessment through quizzes, assignments, classroom participation, and feedback. 6. Independent learning through homework and self-study activities.

102. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Identify and correctly use the basic English tenses and question forms in everyday communication.	Introduction to English Grammar: Present, Past and Future Tenses, Question Forms,	Interactive Lecture, Discussion, Practice Exercises	Classroom Participation, Quiz

			Social Expressions		
2	2	Apply present simple and present continuous tenses accurately in speaking and writing.	Present Tenses: Present Simple, Present Continuous, Have / Have Got, Making Conversations	Interactive Lecture, Pair Work, Exercises	Quiz, Homework
3	2	Distinguish between past simple and past continuous and use regular and irregular verbs appropriately.	Past Tenses: Past Simple, Past Continuous, Vocabulary (Regular & Irregular Verbs), Adverbs	Lecture, Practice Activities	Quiz, Assignment
4	2	Use articles, quantifiers, and polite requests correctly in daily communication.	Articles and Quantity: Articles, Quantifiers, Requests and Invitations	Interactive Lecture, Group Activities	Classroom Activit Homework
5	2	Use future forms and common verb patterns appropriately in oral and written communication.	Future Forms and Verb Patterns: Phrasal Verbs, Expressing Doubt and Certainty	Lecture, Pair Work, Practice Exercises	Quiz, Assignment
6	2	Compare people, objects, and situations using comparative and superlative structures correctly.	Comparatives and Superlatives: Describing People and Things	Lecture, Guided Practice	Quiz
7	2	Use the present perfect tense appropriately to describe past experiences and recent events.	Present Perfect: Ever, Never, Indefinite Past, Everyday Expressions	Interactive Lecture, Discussion	Quiz, Participatior
8	2	Demonstrate improved vocabulary by using synonyms, antonyms, collocations, and words with similar meanings.	Vocabulary Development: Synonyms, Antonyms, Collocations, Word Choice	Vocabulary Activities, Group Work	Vocabulary Test
9	2	Write coherent narrative and descriptive paragraphs using appropriate grammar and vocabulary.	Writing Skills: Narrative and Descriptive Writing	Writing Workshop, Individual Practice	Written Assignme
10	2	Demonstrate achievement of the learning outcomes covered in the first half of the course.	Midterm Examination	Written Examination	Midterm Exam
11	2	Deliver short presentations and participate effectively in discussions using appropriate English expressions.	Speaking Skills: Presentations, Technical Reports, Seminar Skills, Team Discussion	Student Presentations, Group Discussion	Presentation Assessment
12	2	Apply passive voice and relative clauses accurately in written and spoken English.	Grammar Review: Passive Voice and Relative Clauses	Interactive Lecture, Practice Exercises	Quiz
13	2	Identify and correct common grammatical and writing errors independently.	Error Analysis and Language Correction	Guided Practice, Peer Review	Assignment
14	2	Translate simple technical texts between English and Arabic using appropriate engineering terminology.	Technical Translation: English–Arabic /	Translation Practice	Translation Assignment

			Arabic–English		
15	2	Review and integrate all language skills in preparation for the final examination.	Comprehensive Course Review	Revision Session, Question & Answer	Continuous Assessment

103. 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

104. Learning and Teaching Resources

Required textbooks (curricular books, if any)	New Headway for Beginner / Student book 4th edition
Main references (sources)	English Grammar in Use - Raymond Murphy
Recommended books and references (scientific journals, reports…)	English Grammar in Use - Raymond Murphy
Electronic References, Websites	British Council: Learn English Online