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

# Academic Program and Course Description Guide

**2024−2025**

# Introduction:

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

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

This guide, in its second version, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly)

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

## Concepts and terminology:

**Academic Program Description:** The description of the academic program 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 student to achieve, proving whether he has made the most of the available learning opportunities. It is derived from the description of the program.

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

**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 (semester, yearly)whether it is a requirement (ministry, university, college and scientific department)with the umber of study units.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by the student 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 member to develop the student's teaching and learning, and they are plans that are followed to reach the learning goals. Describe all classroom and extra-curricula

Ministry of higher Education and scientific

Research scientific supervision and evaluation device department of quality Assurance and Academic Accreditation

Academic program description from for colleges and institutes

For the year 2024-2025

University: Al-Furat Al-Awsat Technical University

College/Institute: Samawa Technical Institute

Scientific Department: Department of Information and Communication Technology

File filing date: 14/9/2024

The signature:

Name of Department Head : Assist.Lec Baydaa Hadi Al-Saoudi

Date : 21/9/2024

The signature:

Name of Scientific Assistant: Dr.Basim Abdullah kadhum

Check the file BY

Division of Quality Assurance and University performance

Name of the Director of the Quality Assurance and University Performance

Division: Assist.Lec Izdihar Yasir Mohsin

The date: 25/9/2024

The signature:

Authentication of the Dean

Prof.Sabah muhammad malakat

## 1. **Program Vision**

The Department of Information Technology seeks to provide the elements of continuous development of education in the field of information technology to keep pace with the rapid scientific and technological developments and improve university performance, and to raise the department's graduates to the level of excellence and high competitiveness, and to complete distinguished scientific research and studies and maximize the role of the department in serving the environment and community development.

## 2. **Program Mission**

Preparing a constellation of graduates and researchers with a distinguished style in the field of information and communication technology and facilitating the use of technology and information resources, and this is done through a cadre capable of creating and disseminating knowledge through cooperative societies, in addition to strengthening partnerships that facilitate cooperation between education, industry, and the government on the one hand, and meet the needs of the labor market on the other hand and raise the student to the level of ambition that serves the Iraqi society and its requirements to have Iraq a prominent position among the countries of the world.

## 3. **Program Objectives**

The Department of Information and Communication Technology is one of the departments of the Samawa Technical Institute, and works to prepare graduates specialized in information and communication technology, and are able to keep pace with technological progress related to the reality of the local community and Arab society in general.

This section aims to:

1. Providing the local and Arab market with graduates capable of using information and communication technology in building and developing various communication systems.
2. Establishing the theoretical and scientific concepts of information technology sciences based on basic sciences and their importance in methodological methods
3. Providing qualified human cadres to build computer networks and connect them to the Internet
4. Provide the student with the skills and information necessary to work efficiently and effectively in the fields of communication.
5. Work to refine the student's personality and discover his tendencies and talents through scientific, cultural and sports activities.

6. Introducing students to professional ethics, which in turn helps the graduate in facing general challenges and real professional life.
7. Providing the student with the ability to evaluate alternative solutions to the problem under study and decide on the possibility of using information technology in implementing the solution
8. Providing the student with skills and information in the various fields of ICT applications, developing sound attitudes towards productive and positive interaction work with society, and preparing him to practice work in the following areas:
   - Wireless communications and their tremendous developments.
   - ICT-related security and protection applications.
   - Dealing with the latest ways to manage Internet networks and smart control.
   - Teaching all languages in computer programming and how to develop code
   - Apply AI principles and techniques to problem solving and decision-making.

## 4. Program Accreditation

ABET

## 5. Other external influences

Is there a sponsor for the program? None

## 6. Program Structure

| Program Structure | Number of Courses | Unit of study | Percentage | Reviews* |
|---|---|---|---|---|
| **Requirements of the institution** | **20** | **128** | **Number of courses / number of units * 100 = 15.625** | |
| **College Requirements** | **20** | **128** | **15.625** | |
| **Department Requirements** | **20** | **128** | **15.625** | |
| **Summer Training** | **1** | | | |
| **Other** | | | | |

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

## 7. Program Description

| Year/Level | Course or Course Code | Course Name | Credit Hours | |
|---|---|---|---|---|
| | | | theoretical | practical |
| The first | | C++ programming | 3 | 2 |
| The first | | Digital Circuits | 3 | 2 |
| The first | | Electrical circuits | 2 | 2 |
| The first | | Math | 2 | - |
| The first | | Engineering Drawing | - | 3 |
| The first | | Computer Application (1) | 1 | 2 |
| The first | | English Language | 1 | - |
| The first | | Democracy and Human Rights | 2 | - |
| The first | | Mechanical Workshops + Electronic Computer Maintenance Workshop | - | 3 |
| The second | | Computer Networks | 2 | 2 |
| The second | | Computer & Data Security | 2 | 2 |
| The second | | Communication Systems | 2 | 3 |
| The second | | Computer Architecture | 2 | 2 |
| The second | | Programming in Visual Basic | 1 | 3 |
| The second | | Information Technology & Internet | 1 | 2 |
| The second | | Computer Application (2) | 1 | 3 |
| The second | | English Language | 1 | - |
| The second | | Intelligent Systems | 2 | - |
| The second | | Project | - | 2 |

## 8. Expected learning outcomes of the program

| | |
|---|---|
| **Knowledge** | |
| Learning Outcomes 1 | Cognitive Objectives<br>1- Managing and operating information storage and processing programs.<br>2- Connecting local information networks.<br>3- Obtaining a huge amount of information by connecting computers with the information network.<br>4- Collecting, processing and broadcasting information inside and outside the country and anywhere in the world. |
| **Skills** | |
| Learning Outcomes 2 | Program Skills Objectives<br>1 – Converting a lot of indexes into automatic forms.<br>2 – Connecting computer networks. |

| | |
|---|---|
| | 3 - Linking and installing the electronic monitoring system. |
| Learning Outcomes 3 | General and qualifying skills transferred (other skills related to employability and personal development).<br>1- The student should be able to use the computer in design and use the Internet and modern software.<br>2- Teaching the student some of the laws and theories of mathematics that he needs in the application of laws within the specialization.<br>3- Introducing the student to the basic international standards of human rights and introducing the student to successful democracy as in the developed world.<br>4- Teaching the student the basics of using technical English and in dealing with terms within the specialization and writing reports for the results obtained from the use of computers, electronic circuits and various programs. |
| **Values** | |
| Learning Outcomes 4 | Emotional and value goals.<br>1- Supports the concepts of electronic globalization<br>2- He is proud of his work.<br>3- The student should realize the importance of using electronic computers, electronic devices and communication devices in the life of societies and the need to know the latest developments in this field.<br>4- The student is interested in the rules of correct application in the use of electronic devices and various programs. |

| 9. **Teaching and Learning Strategies** |
|---|
| Theoretical lectures, laboratory experiments, skill acquisition in workshops, **scientific films, use** of interactive smart boards |

## 10. Evaluation methods

1. Daily Tests
2. Classroom activity and participation
3. Semester and final exams
4. Reports

## 11. Faculty

### Faculty Members

| Academic Rank | Specialization | | Special Requirements/Skills (if applicable) | | Preparation of the teaching staff | |
|---|---|---|---|---|---|---|
| | year | special | | | angel | lecturer |
| teacher | Computer Science | 1. Networks<br>2 - computer science | | | 4 | |
| Assistant Lecturer | Computer Science | Artificial Intelligence | | | | |
| Assistant Lecturer | mathematics | Fluids | | | | |

### Professional Development

**Mentoring new faculty members**

Involving faculty members in developmental training courses related to the latest developments in their specializations inside and outside the Iraq and also involving them in development courses related to modern teaching methods and the use of blended learning technology in their lectures

**Professional development of faculty members**

Involving faculty members in developmental training courses related to the latest developments in their specializations inside and outside the Iraq

## 12. Acceptance Criterion

Admission for both genders
The minimum acceptance rate is determined by the bodies represented by the Central Admission Department at the Ministry of Higher Education and Scientific Research.

| 13.**The most important sources of information about the program** |
| --- |
| - Books and scientific documents related to the program, as well as through access to the latest scientific devices and films<br>- The Institute's website and e-mail of the department. |

| 14. Program Development Plan |
| --- |
| − Keep up to date with every development in vocabulary by participating in courses.<br>− Visit educational laboratories.<br>− Access to the latest modern technology in teaching subjects.<br>− Preparing courses that develop the ability of trainers in the laboratory so that they can train students more efficiently.<br>− Providing laboratories with modern programs that keep pace with scientific development in developed countries. |

| | | | | Learning outcomes required from the program | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | | | Skills | | | | Values | | | | |
| | | | | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 | C5 |
| The first | | C++ programming | Essential | * | | | * | | * | * | * | * | * | * | * | * | * | |
| | | Digital Circuits | Essential | | | * | | | | * | | | | | * | | * | |
| | | Electrical circuits | assistant | * | | | * | | | * | * | | | * | * | | * | |
| | | Math | assistant | | | | | | * | | | | * | | | | | * |
| | | Engineering Drawing | assistant | | | | | | * | | | | * | | | | | |
| | | Computer Applications (1) | assistant | * | * | | | | | * | * | | | * | * | | * | |
| | | English Language | assistant | | | | | | | | | | | | | | | |
| | | Democracy and Human Rights | assistant | | | | | | | | | | | | | | | |
| | | Mechanical Workshops + Electronic Computer Maintenance Workshop | assistant | * | | | * | | | * | | | | * | | | | |

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

| | | | | Learning outcomes required from the program | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | | | Skills | | | | Values | | | | |
| | | | | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 | C5 |
| The second | | Internet & Information Technology | assistant | | * | | | | | * | | | | * | * | | * | |
| | | Communication Systems | fundamental | | | | | * | | | | * | * | | | * | * | |
| | | Vogue Basic | assistant | | | * | | | | * | | | | | | | * | |
| | | Intelligent Systems | assistant | | | | | * | | | | * | | | * | | * | |
| | | Computer Networks | fundamental | | | | * | | | | * | | | | * | | * | |
| | | Computer & Data Security | fundamental | | | | | * | | | * | | | | * | | * | |
| | | Computer Apps2 | assistant | | | | | | * | | | | * | | | * | | |
| | | Computer Architecture | fundamental | | | * | | | | * | | | | | | | * | |
| | | English2 | assistant | * | * | | | | | * | | | | * | * | | | |
| | | Project | assistant | | | | | | | * | * | * | | * | | | | |

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

# C++ programming

| | |
|---|---|
| 1. Course Name | |
| Programming in C++ / First Stage | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical + 2 practical + 1 exercises = 5 * 30 weeks = 150 hours per year | |
| 7. Course administrator's name (if more than one name) | |
| Name: Farah Mahmoud Qasim Email: farah.qasim.isa2@atu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | Cognitive goals<br>1- Identify the programming sentence and its importance through examples.<br>2- See a detailed explanation of the programming sentence with examples.<br>3- Studying complete programs that depend on solving them on programming sentences.<br>4- Understands how the computer represents and implements programming sentence inside the computer.<br>Program skills objectives.<br>1 – Develops the skill of the concept of solving the problem and writing solution algorithms.<br>2 – Trains to download the C++ program on the computer.<br>3 – Compares through programming sentences between C and C++ .<br>Emotional and value goals<br>1- He is aware of the importance of learning programming languages in order to keep pace with the development in the digital world and its impact on the development of his country.<br>2- He is convinced of the importance of this in line with the level of his love for his country. |
| 9. Teaching and Learning Strategies | |
| **Strategy** | Teaching the student to write the steps to solve a problem and then write solution algorithm represented by the diagram<br>Sagittal or semi-program and then a practical example is taken on that. |

## 10. Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1 | 5 | Software - What is software and its types - Stages of solving programs in C++ - Algorithm (steps) Solving problems input-processing-Output | Software | Theoretical + practical lectures | Editorial + Practical |
| 2 | 5 | Flowchart - Semi-Program Pseud code - Miscellaneous examples - Definitions | Process flow chart | Theoretical + practical lectures | Editorial + Practical |
| 3 | 5 | What is actually going on in the computer (how the computer performs and executes the code sentence inside the computer - important definitions - logical errors - grammatical errors - notes | What's actually going on in the computer | Theoretical + practical lectures | Editorial + Practical |
| 4 | 5 | Constants and variables (what are they) - why do we need constants and variables in programming - how to determine the basic constants and variables in the problem | Constants and variables | Theoretical + practical lectures | Editorial + Practical |
| 5 | 5 | Data types in C++ - How to write explicit constants in C++ | Data types in C++ | Theoretical + practical lectures | Editorial + Practical |
| 6 | 5 | Declaration of variables in C++ variable definitions – naming variables in C++ (Identifiers) | Announcing variables | Theoretical + practical lectures | Editorial + Practical |
| 7 | 5 | Types of variables in C++ | Types of variables in C++ | Theoretical + practical lectures | Editorial + Practical |
| 8 | 5 | Symbolic constant - Enumerated data - data types Rename data types | Data Types | Theoretical + practical lectures | Editorial + Practical |
| 9 | 5 | Miscellaneous examples – what actually happens in a | Miscellaneous examples | Theoretical + | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| | | **computer when variables are defined** | | **practical lectures** | |
| **10** | **5** | **Representation of integer-representation of real numbers ASCII encoding of symbols** | **ASCII encryption** | **Theoretical + practical lectures** | **Editorial + Practical** |
| 11 | **5** | **Basic I/O sentences - common mistakes - logical errors - grammar errors - definitions** | **Basic I/O sentences** | **Theoretical + practical lectures** | **Editorial + Practical** |
| 12 | **5** | **Programmatic activity-writing programs:- Calculating the perimeter and area of a known radius**<br>- Calculation of the circumference and area of an unknown radius - a program that calculates the rate of three numbers | **Software activity**<br><br>**Software activity** | **Theoretical + practical lectures** | **Editorial + Practical** |
| 13 | **5** | **Assignment Statement - Assignment Statement - Assignment Statement Why Use Arithmetic Expressions What - Why Use Logical Expressions What - Why Use** | **Joomla Customization** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **14** | **5** | **Customization and expression in C++ Assignment And Expressions General form of the assignment sentence** | **Customization and expression** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **15** | **5** | **Allocation sentence and data types - arithmetic expressions - general formula for arithmetic expressions** | **Allocation clause and data types** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **16** | **5** | **Characteristics of arithmetic operations and priorities of arithmetic operations** | **Properties of programmatic arithmetic expressions** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **17** | **5** | **Logical expressions- The general form of logical expressions. Priorities in logical expressions** | **Logical idioms** | **Theoretical + practical lectures** | **Editorial + Practical** |

| | | | | | |
|---|---|---|---|---|---|
| 18 | 5 | Miscellaneous examples:- Degree Transfer Program Celsius to Fahrenheit Prog to calculate Total and average grades o students | Miscellane ous examples | Theoretic al + practical lectures | Editorial + Practical |
| 19 | 5 | Conditional Control Statements in C++ Conditio Statement Simple IF Statement | Simple IF control statement | Theoretic al + practical lectures | Editorial + Practical |
| 20 | 5 | Nested IF clause Joomla Control IF... THE A... (General form of the conditional control clause IF.. ELSE) | Nested IF clause | Theoretic al + practical lectures | Editorial + Practical |
| 21 | 5 | Miscellaneous examples:- IF usage program – IF use.. THE OUTFIT | Miscellane ous examples | Theoretic al + practical lectures | Editorial + Practical |
| 22 | 5 | Rotation and repetition clauses - definition of repetition - repetition in C++ - conditional repetition while - general form of the while sentence | Sentences of rotation and repetition | Theoretic al + practical lectures | Editorial + Practical |
| 23 | 5 | Numerical repetition for – general formula For the sentence do(....)whi (condition) - formiscellaneo examples Using the FOR clause. | Numerical repetition for | Theoretic al + practical lectures | Editorial + Practical |
| 24 | 5 | Joomla SWITCH Control Program using SWITCH | Joomla SWITCH Control | Theoretic al + practical lectures | Editorial + Practical |
| 25 | 5 | Functions in C++ Functions The- General forr the function – Function declaration (gen formula) -Function call - Vertical files Mathematical function libra Programming using functio Functions without paramete | Functions in language C++ | Theoretic al + practical lectures | Editorial + Practical |
| 26 | 5 | Matrices – Matrices in C + + One-dimensional Matrix – General Formula Him. Customize values in array elements – Enter and show single ma values. | Matrices | Theoretic al + practical lectures | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| **27** | **5** | **Arithmetic and logical operations on Matrices – Miscellaneous examples.** | **Arithmetic ar logical operations o Matrices** | **Theoretic al + practical lectures** | **Editorial + Practical** |
| **28** | **5** | **Two-dimensional matrix – general formula to declare and initialize the two-dimensional matrix. Perform different operations on the matrix Two-dimensional.** | **Two-dimensiona l matrix** | **Theoretic al + practical lectures** | **Editorial + Practical** |
| **29** | **5** | **strings in the C++ strings language) – Read symbolic strings. Offi functions To deal with symbolic string** | **strings in the C++ strings language)** | **Theoretic al + practical lectures** | **Editorial + Practical** |
| **30** | **5** | **Miscellaneous examples.** | **Miscellane ous examples.** | **Theoretic al + practical lectures** | **Editorial + Practical** |

## 11. Course Evaluation

Daily Exams / Classroom Activity and Participation / Semester and Final Exams

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (methodology, if any | **None** |
| Main references (sources) | **Learn C++ programming Language**<br><br>**Microcomputer Technologies / Technical Institutes Authority**<br><br>Brain structure up the c + + programming language .-<br>**Add – Wesley , third edition , 2004 .**<br>Data structure and problem solving using C + + ,1999 .<br>Mark Allen Weiss ,(second edition) .<br>Problem solving and programming concepts ,2003 . |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

# Digital Circuits

| |
|---|
| 1. Course Name |
| Digital Circuits |
| 2. Course Code |
| |
| 3. Semester / Year |
| Academic Year 2024/2025 |
| 4. The history of preparation of this description |
| 9/7/2024 |
| 5. Available Attendance Forms |
| Daily mandatory attendance |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 2 theoretical + 2 practical + 1 exercises = 5 * 30 weeks = 150 hours per year |
| 7. Course administrator's name (if more than one name) |
| Name: Mortada Kamel Email: murtadha.ali@atu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | Cognitive goals<br>1 The student learns how to use logic gates in digital electronic circuits<br>Course skills objectives.<br>1- Explaining the topics of digital systems by specialists in the subject with an emphasis on the use of logic gates as a basis for understanding and learning.<br>2- Provide them with the skills of designing electronic circuits for digital systems.<br>3- Emphasis is placed on electronic circuit applications<br>4- Providing them with the skills of implementing designs practically and how to use them<br>Emotional and value goals<br>1 - Enable students to think and analyze topics related to digital systems<br>2- Enable students to think and analyze topics related to solving practical problems. |

| |
|---|
| 9. Teaching and Learning Strategies |

| | |
|---|---|
| **Strategy** | - Enable students to link theories with the practical reality of electronic circuits.<br>- Enable students to self-development continuously after graduation. |

## 10. Theoretical Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1 | 2 | Introduction to the electronic Computer (generations of computers - classification of computers - an overview of computer networks) | Introduction to the electronic Computer | Theoretical + practical lectures | Editorial + practical |
| 2 | 2 | Numerical systems (decimal, binary, octal, hexadecimal) - transformations between numerical systems. | Numerical systems | Theoretical + practical lectures | Editorial + practical |
| 3 | 2 | Arithmetic operations in binary – complements in binary – the use of complements in the subtraction process in the binary system. | Calculations in binary system | Theoretical + practical lectures | Editorial + practical |
| 4 | 2 | Representation of numbers in electronic Computer (BCD, 4Bit BCD, ASCII-7, EBCDIC) | Representing Numbers in an Electronic Computer | Theoretical + practical lectures | Editorial + practical |
| 5 | 2 | Parity Bit - representation of integers - representation of real numbers. | Parity Bit - representation of integers - representation of real numbers. | Theoretical + practical lectures | Editorial + practical |
| 6 | 2 | Logic gates (XNOR, XOR, NAND, NOT, OR, AND ) | Logic gates | Theoretical + practical lectures | Editorial + practical |
| 7 | 2 | The laws of Boolean algebra and de Morcan's theorem and their use in simplifying rational equations. | Laws of Boolean algebra and de Morcan's theorem | Theoretical + practical lectures | Editorial + practical |
| 8 | 2 | Representation of different logic circuits using universal gates ( NAND and NOR ). | Represent different logic circuits using universal gates, | Theoretical + practical lectures | Editorial + practical |
| 9 | 2 | Methods of writing logical equations from the truth table (SOP | Methods of writing logical | Theoretical + practical lectures | Editorial + practical |

| | | | | | |
|---|---|---|---|---|---|
| | | product collection method, POS sum product method ) | equations from a truth table | | |
| 10 | 2 | Carnot Chart (for two, three and four variables). | Carnot Chart | Theoretical + practical lectures | Editorial + practical |
| 11 | 2 | Simplify logical equations using the Carnot diagram. | Simplify logical equations using the Carnot diagram. | Theoretical + practical lectures | Editorial + practical |
| 12 | 2 | Arithmetic circles (half of the whole, the complete sum, parallel addition circles) | Computational circuits | Theoretical + practical lectures | Editorial + practical |
| 13 | 2 | Subtraction circles (semi-subtraction, perfect subtraction, subtraction circles using sum circles by the complementary method of 1) | Subtraction circles | Theoretical + practical lectures | Editorial + practical |
| 14 | 2 | Decoder – Encoder Circuit. | Code Solver Circle | Theoretical + practical lectures | Editorial + practical |
| 15 | 2 | Single rank digital comparator circle – digital comparator for two ranks. | Single rank digital comparator circle – digital comparator for two ranks. | Theoretical + practical lectures | Editorial + practical |
| 16 | | Hoppers (overview, S-R hopper, clock timing pulses, synchronous S-R hoppers.) | Hoppers | Theoretical + practical lectures | Editorial + practical |
| 17 | 2 | Hopper J-K , Hopper M / S J-K , Hopper Type D , Hopper Type -, Hopper Type - , Hopper Type – T. | Hopper J-K , Hopper M / S J-K , Hopper Type D , Hopper Type -, Hopper Type - , Hopper Type – T. | Theoretical + practical lectures | Editorial + practical |
| 18 | 2 | Shift Register – Bidirectional offset record. | Offset logs | Theoretical + practical lectures | Editorial + practical |
| 19 | 2 | Counters – Asynchronous counters – Ascending counter – Countdown counter – Ascending/descending counter. | Counters | Theoretical + practical lectures | Editorial + practical |

| | | | | | |
|---|---|---|---|---|---|
| 20 | 2 | Synchronous counters – Consecutive synchronous counter – Parallel synchronous counter. | Synchronous counters | Theoretical + practical lectures | Editorial + practical |
| 21 | 2 | Electronic Computer arrangement (general definitions - Computer parts and function of each part - CPU) | Electronic Computer arrangement | Theoretical + practical lectures | Editorial + practical |
| 22 | 2 | Memories – semiconductor memories (EAPROM, EPROM, PROM, ROM ) – memory vectors. | Memories | Theoretical + practical lectures | Editorial + practical |
| 23 | 2 | Secondary storage devices (magnetic tape - pulley and cassette - magnetic disk - laser disk) | Secondary storage devices | Theoretical + practical lectures | Editorial + practical |
| 24 | 2 | Input and output devices. | Input and output devices. | Theoretical + practical lectures | Editorial + practical |
| 25 | 2 | Digital-to-peer-to-peer converter—Digital-to-peer-type flash converter . | Convert from digital to peer | Theoretical + practical lectures | Editorial + practical |
| 26 | 2 | Adapter from digital to analog type network resistors - accuracy and provisions. | Adapter from digital to analog type network resistors | Theoretical + practical lectures | Editorial + practical |
| 27 | 2 | Conversion from peer-to-digital using the simultaneous and comparative method. | Conversion from peer-to-digital using the simultaneous and comparative method. | Theoretical + practical lectures | Editorial + practical |
| 28 | 2 | ADC by ascending counter method. | ADC by ascending counter method. | Theoretical + practical lectures | Editorial + practical |
| 29 | 2 | Integrated circuits - general idea - types of integrated circuits and the difference between them. | Integrated Circuits | Theoretical + practical lectures | Editorial + practical |
| 30 | 2 | Integrated circuits for logic gates. Integrated circuits for hoppers. | Integrated circuits for logic gates. Integrated circuits for hoppers. | Theoretical + practical lectures | Editorial + Practical |

| Practical Course Structure | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required Learning Outcomes** | **Unit / Subject Name** | **Method of education** | **Evaluation method** |
| **1** | **2** | **General introduction to the subject of digital circuits - familiarizing students with the laboratory board and how to use it - directing students on how to write down the practical results and prepare the weekly report.** | **General introduction to the subject of digital circuits** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **2** | **2** | **ACHIEVE THE WORK OF THE BASIC GATES (NOT – OR – AND ).** | **Achieving the work of the basic gates** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **3** | **2** | **Achieving the work of other gates ( vehicle) (NOR – NAND).** | **Realizing the work of other portals** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **4** | **2** | **Connecting logic circuits using different gateways.** | **Connecting logic circuits using different gateways.** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **5** | **2** | **Achieving the work of exceptional gates (XNOR – XOR).** | **Achieving the work of exceptional gates (XNOR – XOR).** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **6** | **2** | **Design of logic circuits using comprehensive gates (NOR – NAND).** | **Design of logic circuits using comprehensive gates (NOR – NAND).** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **7** | **2** | **Realization of the laws of Boolean algebra in practice.** | **Realization of the laws of Boolean algebra in practice.** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **8** | **2** | **De Morcan legal investigation in practice.** | **De Morcan legal investigation in practice.** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **9** | **2** | **Half Collector Circle Half Adder .** | **Half Collector Circle Half Adder .** | **Theoretical + practical lectures** | **Editorial + Practical** |

| | | | | | |
|---|---|---|---|---|---|
| 10 | 2 | Half Subtractor circle. | Half Subtractor circle. | Theoretical + practical lectures | Editorial + Practical |
| 11 | 2 | Full Adder Collector Department . | Full Adder Collector Department . | Theoretical + practical lectures | Editorial + Practical |
| 12 | 2 | Full Subtractor circle . | Full Subtractor circle . | Theoretical + practical lectures | Editorial + Practical |
| 13 | 2 | Circle screwdriver Decoder . | Circle screwdriver Decoder . | Theoretical + practical lectures | Editorial + Practical |
| 14 | 2 | Encoder coding circuit . | Encoder coding circuit . | Theoretical + practical lectures | Editorial + Practical |
| 15 | 2 | Digital comparator circle for one rank.1-Bit Digital Comparator | Digital comparator circle for one rank.1-Bit Digital Comparator | Theoretical + practical lectures | Editorial + Practical |
| 16 | 2 | Digital comparator circuit for two mattresses.2-Bit Digital Comparator | Digital comparator circuit for two mattresses.2-Bit Digital Comparator | Theoretical + practical lectures | Editorial + Practical |
| 17 | 2 | Hopper circle S-R . | Hopper circle S-R . | Theoretical + practical lectures | Editorial + Practical |
| 18 | 2 | Hopper circle J-K . | Hopper circle J-K . | Theoretical + practical lectures | Editorial + Practical |
| 19 | 2 | Hopper circle type – D . | Hopper circle type – D . | Theoretical + practical lectures | Editorial + Practical |
| 20 | 2 | Circle hopper type – T . | Circle hopper type – T . | Theoretical + practical lectures | Editorial + Practical |
| 21 | 2 | The circle of the hopper master - black (Master - Slave). | The circle of the hopper master - black (Master - Slave). | Theoretical + practical lectures | Editorial + Practical |
| 22 | 2 | Shift Register . | Shift Register . | Theoretical + practical lectures | Editorial + Practical |
| 23 | 2 | Ascending (asynchronous) ripple counter. | Ascending (asynchronous) ripple counter. | Theoretical + practical lectures | Editorial + Practical |
| 24 | 2 | Descending (asynchronous) ripple counter. | Descending (asynchronous) ripple counter. | Theoretical + practical lectures | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| **25** | **2** | **Bidirectional undulating counter coefficient – 8 .** | **Bidirectional undulating counter coefficient – 8 .** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **26** | **2** | **Binary synchronous counter** | **Binary synchronous counter** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **27** | **2** | **Non-binary synchronous counter.** | **Non-binary synchronous counter.** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **28** | **2** | **Generate square waves using hoppers.** | **Generate square waves using hoppers.** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **29** | **2** | **Digital-to-analog circuit using the binary ladder method.Binary Ladder DAC** | **Digital-to-analog circuit using the binary ladder method.Binary Ladder DAC** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **30** | **2** | **Analog-to-digital circuit using the counter method.Counter-type ADC** | **Analog-to-digital circuit using the counter method.Counter-type ADC** | **Theoretical + practical lectures** | **Editorial + Practical** |

## 11. Course Evaluation

Daily Exams / Classroom Activity and Participation / Semester and Final Exams

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (methodology, if any | **None** |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

# Electrical circuits

| | |
|---|---|
| 1. Course Name | |
| Electrical circuits | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical + 2 practical + 1 exercises = 5 * 30 weeks = 150 hours per year | |
| 7. Course administrator's name (if more than one name) | |
| Name: Ahmed Abdul Kazem<br>Email: hamid.shakir.isa5@atu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | Cognitive goals<br>1- The student should know the basic principles of the electrical components involved in communication systems.<br>2- To know the basic principles of the design of electrical circuits that support the transmitters and receivers of the communication system.<br>3- The student should know the basic principles of succession and parallel resonance circuits and their uses<br>4- The student should know the uses of important electrical circuits and how to use them in the practical aspect in various aspects of life (in homes - factories - various workshops)<br>Course skills objectives.<br>1 - The student can design and implement some electrical circuits that are used in communications<br>2 - The student can use and design electrical circuits in the antenna system and how to maintain them<br>Emotional and value goals<br>1- The student is interested in designing electrical appliances.<br>2- The student is interested in maintaining the electrical appliances system.<br>3- The student should realize the importance of using electrical systems in the life of societies and the need to know the latest developments in this field.<br>4- The student is interested in the correct drawing rules for the different electronic circuits. |

| 9. Teaching and Learning Strategies | |
|---|---|
| **Strategy** | **- Teaching the student the uses of important electrical systems and how to use them in the practical aspect in various aspects of life (in homes - factories - various workshops)**<br>**- Teaching the student some mathematical laws and theories that he needs in the application of laws within the specialization.**<br>**- Teaching the student the correct methods in drawing various electronic and electrical systems and circuits.**<br>**- Teaching the student the basics of using technical English and in dealing with terms within the specialization**<br>**And writing reports for the results obtained from the use of different communication systems.** |

## 10. Course Structure - Theoretical

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1 | 2 | The system of units used in electricity and units of measurement for each material (its parts and multiples) - Mathematical applications for converting values using units - Definition of basic units of voltage, current and resistance - Components of the electrical circuit - Ohm's law - Factors affecting the value of resistance - Specific resistance of the conductive and insulating material - The effect of temperature on the value of resistance - Thermal coefficient of resistance with solving practical examples. | System of units used in electricity - definition of basic units - factors affecting the value of resistance | Theoretical + practical lectures | Editorial + Practical |
| 2 | 2 | DC circuits include:<br>1. Connecting resistors in series with examples<br>2. Connecting resistors in parallel with examples .<br>3. Mixed connection of resistors with examples<br>4. Stellar and triangular connection of resistors and conversion from one to the other with examples. | DC circuits | Theoretical + practical lectures | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 2 | Kirchhoff's laws – Kirchhoff's laws of current and voltage with practical examples. | Kirchhoff's Laws | Theoretical + practical lectures | Editorial + Practical |
| 4 | 2 | Melman's theory – definition of the theory – how to apply it in direct current. | Melman's theorem | Theoretical + practical lectures | Editorial + Practical |
| 5 | 2 | Thevenen's theorem – definition of the theory – is the greatest power transmitted to the load. How to apply them in DC . | Thiffen's theorem | Theoretical + practical lectures | Editorial + Practical |
| 6 | 2 | Norton's theory – definition of the theory – how to apply it in direct current. | Norton's theorem | Theoretical + practical lectures | Editorial + Practical |
| 7 | 2 | Congruence theory – definition of theory – steps to apply it in solving DC circuits that contain more than one source – solving definitional examples of current and voltage source (constant power distributor) and how to convert from one to the other – the theory of transferring the greatest possible power – defining the theory – defining the theory and deriving its relationships – examples. | Congruence theory | Theoretical + practical lectures | Editorial + Practical |
| 8 | 2 | Alternating quantities The definition of alternating current properties – how to generate alternating current and its wave graph and its relationships – includes the definition of the effective value of RMS, the average value and its relationships to find the formation factor and the value factor of irregular waveforms with practical examples. | Alternating quantities | Theoretical + practical lectures | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| 9 | 2 | Alternating vector quantities - their definition - phase and graph representation - phase angle and how to find them - finding the resultant vector quantities includes multiplication, division, addition and subtraction with practical examples. | Vector Alternating Quantities | Theoretical + practical lectures | Editorial + Practical |
| 10 | 2 | The effect of alternating current on a circuit containing only resistance – a circuit containing only pure inductance – a circuit containing only pure amplitude – finding the phase angle between current and voltages for each circuit with examples. | AC effect | Theoretical + practical lectures | Editorial + Practical |
| 11 | 2 | The effect of alternating current on a circuit containing (resistance and inductance respectively - resistance and dilation respectively - resistance, inductance and dilation respectively) - finding the relationship between current and voltage in the three cases phase angle - total resistance of the circuit with applied examples. | Vector Alternating Quantities | Theoretical + practical lectures | Editorial + Practical |
| 12 | 2 | The effect of alternating current on a circuit containing (resistance and inductance - resistance and amplitude - resistance, inductance and amplitude) in parallel - finding the relationship between voltages and current in the three cases - phase angle - total resistance of the circuit with applied examples. | AC effect | Theoretical + practical lectures | Editorial + Practical |
| 13 | 2 | Use the characterization J-OPERATOR or composite factor to find the total impedance, total tolerance, current, voltage and phase angle of impedance interconnection circuits in | USING THE J-OPERATOR PROFILE | Theoretical + practical lectures | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| | | series and parallel with the solution of examples. | | | |
| 14 | 2 | Resonance circuits, including the series resonance circuit and parallel resonance (definition of the resonance state and how to reach it - calculation of current, voltages, impedance, phase angle and frequency at resonance - finding the beam width - quality factor - drawing the relationship between inductive and capacitive reactance with frequency - solving examples of both cases) | Resonant circuits | Theoretical + practical lectures | Editorial + Practical |
| 15 | 2 | Apply theorems such as Norton and Thevenen theorems and congruence to alternating current circuits with solving examples. | Application of theories | Theoretical + practical lectures | Editorial + Practical |
| 16 | 2 | Power in alternating current circuits includes the calculation of power on circuits containing (resistance only - inductance only - amplitude only resistance, inductance and dilated respectively and in parallel) Definition of effective and inactive power and how to calculate them. | Define effective and passive capacity and how to calculate them | Theoretical + practical lectures | Editorial + Practical |
| 17 | 2 | Total apparent power (definition) - how to draw a power triangle - power factor - definition and its effect on alternating current circuits - how to improve the power factor with practical examples. | Total apparent capacity | Theoretical + practical lectures | Editorial + Practical |
| 18 | 2 | The theory of transferring the greatest possible power in alternating current circuits – deriving its relationship with practical examples. | Power in AC circuits | Theoretical + practical lectures | Editorial + Practical |
| 19 | 2 | Analysis of electrical networks by node voltage method - introduction - node | Analysis of electrical networks | Theoretical + practic | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| | | voltages - number of node voltage equations - node voltage equations by examination - joint forgiveness - transition tolerance. | | al lecture s | |
| 20 | 2 | Practical examples of the analysis of electrical networks by the node method. | Network Analysis | Theore tical + practic al lecture s | Editorial + Practical |
| 21& 22 | 2 | Three-phase alternating current circuits - its definition and how to generate alternating current (one phase - two phases - three phases) with each circuit drawing connections of the star and triangular shape in three-phase alternating current circuits and special relationships to calculate the current and voltage of the line and phase, the total power and the power of the line - the capacity of the phase - the advantages of each connection when used in balanced and unbalanced loads with examples. | Three-phase alternating current circuits | Theore tical + practic al lecture s | Editorial + Practical |
| 23 | 2 | Solve practical examples of three-phase alternating current and triangular and stellar connections from balanced and unbalanced loads. | Three-phase alternating current circuits | Theore tical + practic al lecture s | Editorial + Practical |
| 24&25 | 2 | Methods of measuring the power of three-phase loads - the watmeter device - how to link it to the circuit to measure the effective power and calculate the inactive power and apparent capacity with an example solution - measuring the power using a watmeter and voltage - how to find the total power in this way and in the case of stellar and triangular connection - using two watmtmeters - three watmeters. | Three-phase alternating current circuits | Theore tical + practic al lecture s | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| 26&27 | 2 | Electrical filters - types - conversion functions. | Transcircuit Status RL - RC - RLC | Theoretical + practical lectures | Editorial + Practical |
| 28 | 2 | LPF –HPF –BPF – cascade section | Self-induction | Theoretical + practical lectures | Editorial + Practical |
| 29 | 2 | Applications on filters and their design | Filters | Theoretical + practical lectures | Editorial + Practical |
| 30 | 2 | Current growth and decay curves from the induction circuit – Explanation of this circuit and its effect on direct current – Public relations for the growth and decay of current in the coil – Drawing current and calculating the constant time – Solving examples – Charging and discharging capacitors The use of amplitudes in DC circuits includes the general relationship of charging and discharging the capacitor and drawing current The effect of constant time and its calculation – Solving examples. | Current growth and decay curves from an inductive circuit | Theoretical + practical lectures | Editorial + Practical |

Course Structure - Practical

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1 | 2 | Learn about the way the laboratory works, the way reports work, and the use of devices | Learn about laboratory tools | Theoretical + practical lectures | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| 2 | 2 | 5. Calculation of resistors in colors - resistance measuring device (ohmmeter) Calculation of resistance in colors - calculation of error rate. | Calculation of resistors in color | Theoretical + practical lectures | Editorial + Practical |
| 3 | 2 | The use of continuous and alternating voltage measuring devices - the use of direct and alternating current measuring devices (represented by the fomometer) - the use of a continuous power equipment. | Continuous and alternating voltage meters | Theoretical + practical lectures | Editorial + Practical |
| 4 | 2 | Measurement of the electromotive force and internal resistance of the battery - the study of the thermal coefficient of resistance. | Measurement of the electromotive force and internal resistance of the battery | Theoretical + practical lectures | Editorial + Practical |
| 5 | 2 | Determination of the specific resistance of some conductors – Realization of Ohm's law in practice | Determination of specific resistance | Theoretical + practical lectures | Editorial + Practical |
| 6 | 2 | Connecting resistors (succession - parallel - mixed) multiple exercises. | Connecting resistors | Theoretical + practical lectures | Editorial + Practical |
| 7 | 2 | Achieving equivalence of the circles of the star and triangular shape of the direct current (multiple exercises). | Star and trigonometric connection | Theoretical + practical lectures | Editorial + Practical |
| 8 | 2 | Realization of Kirchhoff's first and second laws in practice. | Kirchhoff's first and second laws | Theoretical + practical lectures | Editorial + Practical |
| 9 | 2 | Investigation of theorems (Thevenen and Norton). | Thefnen and Norton theories | Theoretical + practical | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| | | | | lectures | |
| 10 | 2 | Achieving two theories (congruence and exchange). | My theorem (congruence and exchange) | Theoretical + practical lectures | Editorial + Practical |
| 11 | 2 | Power distributor – the theory of transferring the greatest power of direct current – the realization of the theory with its three possibilities. | Capacity Distributor | Theoretical + practical lectures | Editorial + Practical |
| 12 | 2 | Osloscope – comparison between the maximum and average value in practice and calculation of the coefficient of formation and the peak (multiple exercises). | Signal Plotter | Theoretical + practical lectures | Editorial + Practical |
| 13 | 2 | Connecting the series and parallel to (RC - RL). | Connecting Straight and Parallel to (RC - RL) | Theoretical + practical lectures | Editorial + Practical |
| 14 | 2 | Phase angle measurement (RLC) sequentially - (multiple exercises) . | Phase angle measurement (RLC) sequentially | Theoretical + practical lectures | Editorial + Practical |
| 15 | 2 | Phase angle measurement (RLC) is parallel to (multiple exercises). | Phase angle measurement (RLC) parallelism | Theoretical + practical lectures | Editorial + Practical |
| 16 | 2 | Consecutive resonance – parallel resonance. | Consecutive resonance – parallel resonance | Theoretical + practical lectures | Editorial + Practical |
| 17 | 2 | Realization of the theories (Thevenen and Norton) of alternating current. | Thevenen and Norton's theories of alternating current | Theoretical + practical lectures | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| 18 | 2 | Comparison between ordinary and electronic voltmeter in measuring continuous and alternating voltages (multiple exercises). | comparison between ordinary and electronic voltmeters, | Theoretical + practical lectures | Editorial + Practical |
| 19 | 2 | Transfer the greatest possible power in alternating current – the realization of the theory with its three possibilities. | Transmit the greatest possible power in alternating current | Theoretical + practical lectures | Editorial + Practical |
| 20 | 2 | Measuring power using voltmeters and three ammeters is a multi-exercise. | Measuring power using three voltmeters and ammeters | Theoretical + practical lectures | Editorial + Practical |
| 21 | 2 | Measurement of power and power factor using YTR (multiple exercises). | Measurement of power and power factor using watem ytr | Theoretical + practical lectures | Editorial + Practical |
| 22 | 2 | Improve the power factor (multiple exercises). | Power Factor Optimization | Theoretical + practical lectures | Editorial + Practical |
| 23 | 2 | Voltages and current in current circuits Three phase connections (star - triangular) | Connections (stellar - triangular) in alternating current | Theoretical + practical lectures | Editorial + Practical |
| 24 | 2 | Resistance using a Taskon bridge (multiple exercises). | Resistance using a Withstoon arch | Theoretical + practical lectures | Editorial + Practical |
| 25 | 2 | Loaded voltage divider – Non-loaded-voltage divider. | | Theoretical + practical lectures | Editorial + Practical |
| 26 | 2 | Measuring resistors using an ammeter and a | Measuring resistors using | Theoretical + practic | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| | | **voltmeter (multiple exercises).** | **an ammeter and voltmeter** | **al lectures** | |
| **27** | **2** | **Using the magnifier to measure high-value resistors (insulators) – (multiple exercises).** | **Magnifier for measuring high-value resistors (insulators)** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **28** | **2** | **Increase the measurement range of the ammeter device – calibration of the ammeter device using another device.** | **Calibration of the meter device** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **29** | **2** | **Increase the measurement range of the voltmeter – calibration of the voltmeter.** | **Voltmeter calibration** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **30** | **2** | **Time constant study of inductive circuit - (RL)Study of the time constant of a capacitive circuit (RC).** | **Study of the time constant of an inductive circuit** | **Theoretical + practical lectures** | **Editorial + Practical** |

## 11. Course Evaluation

Daily Exams / Classroom Activity and Participation / Semester and Final Exams

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (methodology, if any | **None** |
| Main references (sources) | **1- Electrical Technology (Edward Hughes).**<br>**2- Basic Circuit (A.M. Brooks). Pergaman press.**<br>**3- Introduction To Electric Circuit (M. Romanwltz) John Willey.**<br>**4- Basic Electrical Engineering (Fitzgerald & Rlgginbothan). Graw**<br>**Principles of Electrical Engineering Science - Written by Mohamed Zaki - Dr. Muzaffar Anwar.** |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

# Math

| | |
|---|---|
| 1. Course Name | |
| Math | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical + 1 exercise = 3 * 30 weeks = 90 hours per year | |
| 7. Course administrator's name (if more than one name) | |
| Name: Liqa Tariq Hadi Email: lqaa.hadi@atu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | **Cognitive goals**<br>**1- The student should know the correct mathematical methods in the solution.**<br>**2- The student should know the principles of calculus to link them with other scientific subjects.**<br>**3- The student should know the drawing of functions.**<br>**Course skills objectives.**<br>**1 – The student should be able to analyze mathematical problems.**<br>**2 – The student should be able to use logical methods of solution.**<br>**3- The student should be able to calculate the results by the correct scientific methods.**<br>**4- The student should be able to use the electronic Computer to calculate some values.**<br>**Emotional and value goals**<br>**1- The student is interested in mathematical skills.**<br>**2- The student is interested in intellectual skills.**<br>**3- The student is interested in the mechanical skills of the solution.**<br>**4- The student understands the importance of mathematics and its interference with other basic subjects.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | Teaching the student the mathematical methods and laws th he needs within the specialization. |

| 10.Course Structure | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required Learning Outcomes** | **Unit / Subject Name** | **Method of education** | **Evaluation method** |
| **1** | **2** | **Introducing the student to matrices/ determinants** | **Arrays / Determinants** | **Theoretical lectures** | **editorial** |
| **2** | **2** | **Solving Linear Equations – Kramer Method – Applications of Determinants to Evaluate Currents in Electrical Circuits** | **Linear equations** | **Theoretical lectures** | **editorial** |
| **3** | **2** | **Vectors / Vector Analysis / Vector and Scalar Quantities – Vector Algebra – Calculations in Triple Space Some applications on vectors** | **Vector** | **Theoretical lectures** | **editorial** |
| **4** | **2** | **Orthogonal vectors - vector scale - scalar and directional product - and applications to vectors** | **Orthogonal vectors** | **Theoretical lectures** | **editorial** |
| **5** | **2** | **Complex Numbers – Addition, Subtraction, Multiplication and Division of Complex Numbers** | **Complex Numbers** | **Theoretical lectures** | **editorial** |
| **6** | **2** | **The polar formula of a complex number, exponential and general, and how to convert from one formula to another / Using Demoger's theorem of complex numbers / Electrical applications on complex numbers** | **Polar, exponential and general formula** | **Theoretical lectures** | **editorial** |
| **7** | **2** | **Groups / Subgroups C / Union and intersection of groups / Homologous and homogeneous groups / Multiplying the set** | **Groups** | **Theoretical lectures** | **editorial** |

| | | | | | |
|---|---|---|---|---|---|
| | | with itself or another group | | | |
| 9 | 2 | Series / Types of Series - Arithmetic - and Geometric - Find any term of the arithmetic series / Find the sum of the arithmetic series / Find any term of the geometric series / Find the sum of the geometric series | Series | Theoretical lectures | editorial |
| 10 | 2 | differentiation / derivative of algebraic functions by definition and differentiation by rules and applications on differentiation to find velocity and acceleration | Calculus | Theoretical lectures | editorial |
| 11 | 2 | Derivation of implicit functions, trigonometric functions, logarithmic functions, exponential functions, and some applications of differentiation, | Derivation of functions | Theoretical lectures | editorial |
| 12 | 2 | differentiating hyperbolic functions, calculating the time constant, finding the equation of tangent and tangent to tangent, velocity, and acceleration, | Differentiation of redundant functions | Theoretical lectures | editorial |
| 13 | 2 | draw the curve of a function using differentiation and find the limits of the maximum and minor, regions of increment and decrease, inflection points, regions of concavity, and convexity, | Graph the Curve of the Function | Theoretical lectures | editorial |
| 14 | 2 | General physical and engineering applications and some | General Physical and Engineering Applications | Theoretical lectures | editorial |

| | | | | | |
|---|---|---|---|---|---|
| | | applications on the Computer in general | | | |
| 15 | 2 | Integration / Indefinite Integration - Definition of Integration - Characteristics of Integration and Some Applications on Integration | Integration | Theoretical lectures | editorial |
| 16 | 2 | Integration of exponential and trigonometric functions | Integration of functions | Theoretical lectures | editorial |
| 18 | 2 | Definite integral – Applications of definite integrals – Subcurved area – and area between curves | Definite Integral | Theoretical lectures | editorial |
| 19 | 2 | Rotational volumes – arc length – calculation of electrical capacity | Rotational volumes | Theoretical lectures | editorial |
| 20 | 2 | find work, momentum, momentum, and moment of inertia, | Work, determination and momentum | Theoretical lectures | editorial |
| 21-22 | 2 | General methods of integration including substitution, fragmentation, and the use of subfractions , exponential and logarithmic fractions | General methods of integration | Theoretical lectures | editorial |
| 23-24 | 2 | Numerical methods of integration - trapezoidal rule - Simson's rule and finding velocity and acceleration and finding the value of current | Trapezoidal Rule – Samson Base | Theoretical lectures | editorial |
| 25-26 | 2 | Solve Differential Equations Preferred and Homogeneous – Linear and Cogent | Solving Differential Equations | Theoretical lectures | editorial |
| 27 | 2 | Mathematical logic | Mathematical logic | Theoretical lectures | editorial |
| 28 | 2 | Algorithm – Finding the Greatest Common | Algorithm | Theoretical | editorial |

| | | | | | |
|---|---|---|---|---|---|
| | | **Denominator of Two Positive Numbers** | | **lectures** | |
| **29-30** | **2** | **Relation & digraphs relations** | **Relation & digraphs relations** | **Theoretical lectures** | **editorial** |

## 11. Course Evaluation

- Written tests
- Solve a set of exercises after the end of each topic
- Quarterly Exams
- Final Exams
- Daily Assessment

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (methodology, if any | **None** |
| Main references (sources) | **1- From the Shum series (electrical circuit solution). Written by Joseph A.**<br>**2- Methods for solving differential equations. Written by: Ahmed Al-Samarrai and Yahya Abd Saeed.**<br>**3 – Calculus ((Thomas)).**<br>**4 – Laplace transformation.** |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

# Engineering Drawing

| | |
|---|---|
| 1. Course Name | |
| Engineering Drawing | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 3 practical = 3 * 30 weeks = 90 annual hours | |
| 7. Course administrator's name (if more than one name) | |
| Name: Mortada Kamel Email: murtadha.ali@atu.edu. | |
| 8. Course Objectives | |
| **Course Objectives** | **General Objective: Training the student on the corr foundations of engineering drawing and drawing All maps and read them.**<br>**Special goal : to train the student and make him able to u AutoCAD drawing software Engineering and electrical and understanding ma and drawing their landscapes and geometric projections.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | - Teaching the student to express his ideas in the artistic language of the technician, which is drawing.<br>- Teaching the student an important program within t specialization, which is AutoCAD. |

## 10. Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1 | 3 | Know About Engineering Drawing | The importance of engineering and industrial drawing - repair drawing sizes - painting sizes - drawing drawing data table - point definitions line and surface. | Practical application in the laboratory | Editorial + Practical |
| 2 | 3 | Know About AutoCAD | Auto-cad program Identify the different program environment for the screen Menus, screen, scroll bars, tool bars, properties | Practical application in the laboratory | Editorial + Practical |
| 3 | 3 | Knows how to run AutoCAD | Preparing a drawing sheet to open a new file, drawing borders, drawing units - grid - jump - storage. | Practical application in the laboratory | Editorial + Practical |
| 4 | 3 | Learn about drawing commands | Identify the different drawing commands Point ,coardinafes. ... etc. Identify editing-move-copy-offset-mirrores commands | Practical application in the laboratory | Editorial + Practical |
| 5 | 3 | Learn about drawing commands | Osnap Accurate Drawing and Add Dimension | Practical application in the laboratory | Editorial + Practical |
| 6 | 3 | Control the drawing specifications . | Add text and sectors to control drawing specifications. | Practical application in the laboratory | Editorial + Practical |
| 7 | 3 | Three-dimensional drawing | Introduction to three-dimensional drawing Ucs -vports-elev-thickness | Practical application in the laboratory | Editorial + Practical |
| 8 | 3 | Create three-dimensional surfaces | Create three-dimensional surfaces and three-dimensional objects | Practical application in the laboratory | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| 9 | 3 | Draw line types | Draw line types : hidden line, hidden line, center line, clipping line, trim line for small parts, trim line for large parts, cutting level line, dimension line, and spanning line (painting drawing). | Practical application in the laboratory | Editorial + Practical |
| 10 | 3 | Writing Latin letters and numbers | Writing Latin letters and numbers - a panel that includes writing numbers and letters vertically and then diagonally at an angle of 75 $^{5}$ in size of four mm up to ten mm. | Practical application in the laboratory | Editorial + Practical |
| 11 | 3 | Engineering Operations | Engineering operations include: 1- Straight division in equal and unequal proportions2- Straight halving3- Establishing a column on a line or arc from a point inside and a point outside it4- Drawing a line parallel to a known line at a known distance5- Angle halving6- Finding a known arc center or circle7- Drawing a circle that touches the sides of a floating triangle from the inside and outside (drawing one painting). | Practical application in the laboratory | Editorial + Practical |
| 12 | 3 | Drawing diamonds for the circle | Drawing diamonds for the circle: 1- Drawing an arc that touches two known circles from the inside2- Drawing an arc that touches two known circles from the outside3- Drawing a straight that touches two known circles from the outside5- Drawing an arc for half of a known Qatar that touches a line and a known circle. | Practical application in the laboratory | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| 13 | 3 | Drawing a Regular , Pentagonal, and Regular Hexagon, | Drawing a regular polygon given the length of the side in the general way, drawing a regular pentagon given the Qatar of a circle, drawing a regular hexagon given the Qatar of a circle-drawing the perspective of a circle at an angle of 30. | Practical application in the laboratory | Editorial + Practical |
| 14 | 3 | Explanation of electrical and electronic symbols | Explanation of electrical and electronic symbols | Practical application in the laboratory | Editorial + Practical |
| 15 | 3 | Drawing of electrical and electronic code board | Drawing of electrical and electronic code board | Practical application in the laboratory | Editorial + Practical |
| 16 | 3 | Electrical installations- | Electrical installations - drawing a special panel for electrical installations of a room with an attached store. | Practical application in the laboratory | Editorial + Practical |
| 17 | 3 | Drawing a plate for the complete connections of a fluorescent tube | Drawing a plate for the complete connections of a fluorescent tube | Practical application in the laboratory | Editorial + Practical |
| 18 | 3 | Drawing an electronic connection board | Drawing an electronic connection board containing a set of electronic circuits. | Practical application in the laboratory | Editorial + Practical |
| 19 | 3 | Drawing a simple holographic shape | Draw a simple hologram at angles 30 and 45. | Practical application in the laboratory | Editorial + Practical |
| 20 | 3 | explain the placement of dimensions on the drawing in a geometric way, | Explain the placement of dimensions on the drawing in a geometric way, drawing a painting that includes two perspectives with all dimensions in a geometric way. | Practical application in the laboratory | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| 21 | 3 | Drawing the complex perspective | Drawing a complex perspective containing cylindrical shapes or cavities - drawing a painting that includes two perspectives with dimensional writing in a geometric way. | Practical application in the laboratory | Editorial + Practical |
| 22 | 3 | Drawing a board for an electronic circuit | Drawing a board for an electronic circuit containing gates of gates. | Practical application in the laboratory | Editorial + Practical |
| 23 | 3 | Drawing a board for an electronic circuit | Drawing a board for an electronic circuit containing integrated circuits | Practical application in the laboratory | Editorial + Practical |
| 24 | 3 | Drawing a board for an electronic circuit | Drawing a board for an electronic circuit containing gates and integrated circuits | Practical application in the laboratory | Editorial + Practical |
| 25 | 3 | Applications on drawing projections | Applications on drawing projections from different perspectives. | Practical application in the laboratory | Editorial + Practical |
| 26 | 3 | Applications on drawing projections | Drawing perspective from the three projections | Practical application in the laboratory | Editorial + Practical |
| 27 | 3 | Drawing panel to control the speed of the drive | Drawing a plate to control the speed of a three-phase motor | Practical application in the laboratory | Editorial + Practical |
| 28 | 3 | How to read a map | How to read a map or set of maps of electrical circuits. | Practical application in the laboratory | Editorial + Practical |
| 29-30 | 3 | Electrographic Applications | Electrographic applications on the electronic Computer. | Practical application in the laboratory | Editorial + Practical |

| 11. Course Evaluation | |
|---|---|
| **Observation, Interview, Student Cumulative Record, Practical Exams** | |
| 12. Learning and Teaching Resources | |
| Required textbooks (methodology, if any) | **None** |
| Main references (sources) | 1- Descriptive Geometry - Medhat Faisal Fadil - Al-Zaman Press 1977<br>2- Descriptive Geometry - Mohamed Amin Waheeb - Faculty of Engineering, Ain Shams University 1979<br>3-Engineering Drawing Technology((A.W-Wander William))MC-Graw-Hill 1977<br>4-Engineering Drawing Graphic Techologl by: Frend MC-Graw-Hill 1976 |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

## Computer Software(1)

| | |
|---|---|
| 1. Course Name | |
| Computer Applications | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 1 theoretical + 2 practical = 3 * 30 weeks = 90 annual hours | |
| 7. Course administrator's name (if more than one name) | |
| Name: Liqa Tariq Hadi Email: lqaa.hadi@atu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | **<u>General Objective</u>: For the purpose of teaching some of the vocabulary of the digital culture curriculum for computers and the Internet IC3, which is adopted in all developed countries, as it includes an overview of the computer, its components, operating systems used in most devices and applications of the program (Microsoft Office)**<br>**Cognitive goals**<br>**1- Introducing the student to the component parts of the Computer and how to use it.**<br>**2- Introducing the student to the most important programs used in engineering applications such as Word, Excel .**<br>**Course skills objectives.**<br>**1 – The skill of using the electronic Computer.**<br>**2 – Acquire the skill of printing laboratory reports using the Word program.**<br>**Emotional and value goals**<br>**1- The student should know the modern operating systems of different types, importance and tasks that he performs.**<br>**2- Instilling confidence in the same student to use office application programs.**<br>**3- The student should pay attention to the correct rules in using the computer.**<br>**4- Making the student communicate with the outside world.**<br>**5- The student should learn computer maintenance.**<br>**6- The student realizes the importance of computers in various fields.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | **Theoretical lectures + practical applications + scienti films** |

## 10. Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1-3 | 3 | Computer system: Hardware Physical Components:<br><br>External parts: Main unit - screen - keyboard ..... etc<br><br>Internal parts: motherboard - CPU - compute unit - control unit - memory module - storage unit - storage capacity measurement unit.<br><br>. Input and output devices.<br><br>Software Software:<br><br>. Operating Systems<br>. Application Software<br>. Programming Languages | Computer system: Hardware Physical Components:<br><br>External parts: Main unit - screen - keyboard ..... etc<br><br>Internal parts:<br><br>. Input and output devices.<br><br>Software Software: | Theoretical + practical lectures | Editorial + Practical |
| 4-6 | 3 | General introduction to computers - operating systems - versions - privileges - running and terminating the program (Windows XP), recognition of the desktop and all icons such as (start-my computer-internet explorer...), recognition of all start menu commands | General introduction to computers | Theoretical + practical lectures | Editorial + Practical |
| 7-8 | 3 | Change desktop properties (themes-desktop-screen saver..... ), window | Change desktop properties (th | Theoretical + practical | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| | | management on the desktop, window elements function description (tool bar- status bar- title bar- menu bar- horizontal... ), arrange open windows, move inside the window, move the window from one place to another, deal with the dialog box. | | lectures | |
| 9-10 | 3 | Files and folders, browsing files and folders using My computer , choosing files and folders, creating a new folder on the desktop and My document , opening a file or folder, changing the name of a file or folder, deleting a file or folder, retrieving deleted files or folders, exchanging data between documents and different programs, searching for files or folders, copying and pasting. | Files and folders | Theoretical + practical lectures | Editorial + Practical |
| 11-12 | 3 | A detailed study of the start menu , including: My computer- My document- All programs- Run- Control panel..... and access to the details of each of them. | Detailed study of the Start menu | Theoretical + practical lectures | Editorial + Practical |
| 13-14 | 3 | Play and print CDs, add programs such as Word or Excel to the start list , retrieve or delete files and folders | Play and print CDs, add programs such as Word or Excel to the start list , retrieve or delete files and folders from the Recycle bin, | Theoretical + practical lectures | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| | | from the Recycle bin, use Paint and Word pad, use the Windows media player, Help & Support. | use Paint and Word pad, use the Windows media player, Help & Support. | | |
| 15-17 | 3 | -Work with other Windows add-ons (Computer - time - date)<br>-Get help and support | - Work with other Windows add-ons (Computer - time - date)<br>- Get help and support | Theoretical + practical lectures | Editorial + Practical |
| 18 | 3 | Typical testing of operating systems and computer components and questions for review. | Typical testing of operating systems and computer components and questions for review. | Theoretical + practical lectures | Editorial + Practical |
| 19-20 | 3 | Hierarchy of Word word processing program and its purpose, running the program, opening a new file, toolbars such as (menu bar - tool bar - drawing bar....), Control Menu, shortcuts, creating a new document, writing text, storing the document, opening and closing the document. | Hierarchical Word word processing software and its purpose, | Theoretical + practical lectures | Editorial + Practical |
| 21-22 | 3 | Select or shade text Select, update process (cut, copy , paste , replace, page setup, print preview, print. | Select or shade text Select, update process (cut, copy , paste , replace, page setup, print preview, print. | Theoretical + practical lectures | Editorial + Practical |
| 23-24 | 3 | Header & footer, Page numbering, time insertion, date, symbols, etc., Fonts, Paragraph formatting, Boarder & Shading borders, Numbering & | Header & footer, Page numbering, time insertion, date, symbols, etc., Fonts, Paragraph formatting, Boarder & Shading borders, Numbering & Bullets , Multicolumn | Theoretical + practical lectures | Editorial + Practical |

| | | | | | |
|---|---|---|---|---|---|
| | | **Bullets , Multicolumn texts , Spelling & grammar.** | **texts , Spelling & grammar.** | | |
| **25-26** | **3** | **Create and work with tables, add Delete cells , merge and split cells , sorting in table , automatic table formatting .** | **Create and work with tables, add Delete cells , merge and split cells , sorting in table , automatic table formatting .** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **27-28** | **3** | **Create mathematical equations and how to deal with them and change the formula according to demand.** | **Create mathematical equations and how to deal with them and change the formula according to demand.** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **29** | **3** | **Create spaces- Work with multiple pages- Change master page- Specify page source- Create designs- Use automatic header and footer update- Create multiple header and footer in one document- Bullet lists- Remove bullets.** | **Create spaces- Work with multiple pages- Change master page- Specify page source- Create designs- Use automatic header and footer update- Create multiple header and footer in one document- Bullet lists- Remove bullets.** | **Theoretical + practical lectures** | **Editorial + Practical** |
| **30** | **3** | **Typical test on the computer machine for Microsoft Word word processing software and questions for review.** | **Typical test on the computer machine for Microsoft Word word processing software and questions for review.** | **Theoretical + practical lectures** | **Editorial + Practical** |

| 11. Course Evaluation | |
|---|---|
| **Written + Practical + Oral + Discussion** | |
| 12. Learning and Teaching Resources | |
| Required textbooks (methodology, if any) | **None** |
| Main references (sources) | **Computer Applications** |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library** |
| Electronic References, Websites | **Different sources of the Internet** |

# English Language

| |
|---|
| 1. Course Name |
| English Language |
| 2. Course Code |
| |
| 3. Semester / Year |
| Academic Year 2024/2025 |
| 4. The history of preparation of this description |
| 9/7/2024 |
| 5. Available Attendance Forms |
| Daily mandatory attendance |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 1 theoretical = 1 * 30 weeks = 30 annual hours |
| 7. Course administrator's name (if more than one name) |
| Name: Suad Abdel Allah Email : |

| 8. Course Objectives | |
|---|---|
| **Course Objectives** | **A- To provide the student with knowledge of scientific terminology in both general and scientific English.**<br>**B- Teaching the student the basic principles of English grammar for speaking and writing.**<br>**C- Teaching the student how to correctly pronounce scientific and technical terms.**<br>**D- Training the student to use the library and dictionary and extract sources from the Internet.**<br>**Teaching the student to write laboratory reports in English.** |

| 9. Teaching and Learning Strategies | |
|---|---|
| **Strategy** | Theoretical lecture, library to extract sources, Internet, reading scientific pieces in the student's specialization by students and in front of the rest of the students, correct pronunciation of scientific terms. |

10. Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| **1-4** | **1** | Unit -1- Introduction and Review to English language Introduction to parts of speech. Sentence Patterns. | Unit -1- | **Theoretical lectures** | **editorial** |
| **5-6** | **1** | Unit -2- Reading Comprehension and structure. (selected scientific passages general to all specializations) | Unit -2- | **Theoretical lectures** | **editorial** |

| | | | | | |
|---|---|---|---|---|---|
| **7-8** | **1** | Unit -3- Scientific Attitude (Simple present). | Unit -3- | **Theoretical lectures** | **editorial** |
| **9-10** | **1** | Mathematics(passive). | Mathematics(passive). | **Theoretical lectures** | **editorial** |
| **11-12** | **1** | Scientific Methods (simple past) | Scientific Methods (simple past) | **Theoretical lectures** | **editorial** |
| **13** | **1** | Test | Test | **Theoretical lectures** | **editorial** |
| **14-15** | **1** | Unit -4- Conversation (from daily life Meeting people | Unit -4- | **Theoretical lectures** | **editorial** |
| **16-17** | **1** | Talking about your job | Talking about your job | **Theoretical lectures** | **editorial** |
| **18-21** | **1** | Unit -5- The use of library ,Dictionary of information technology and Internet. | Unit -5- | **Theoretical lectures** | **editorial** |
| **22** | **1**<br>**1** | Unit -6- Translation Selected topics from internet to be translated | Unit -6- | **Theoretical lectures** | **editorial** |
| **23-25** | **1** | Unit -7- Writing Technical Reports | Unit -7- | **Theoretical lectures** | **editorial** |
| **26-29** | **1** | Unit -8- Terminology Selected Passages according to specializations | Unit -8- | **Theoretical lectures** | **editorial** |
| **30** | **1** | Final Test | Final Test | **Theoretical lectures** | **editorial** |

## 11. Course Evaluation

Oral exam, written exam, daily tests, annual evaluation, quarterly exams, final exams.

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (methodology, if any) | **None** |
| Main references (sources) | **Unified Book** |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library** |
| Electronic References, Websites | **Different sources of the Internet** |

## Democracy and Human Rights

| | |
|---|---|
| 1. Course Name | |
| Democracy and Human Rights | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 Theoretical = 2 * 30 weeks = 60 annual hours | |
| 7. Course administrator's name (if more than one name) | |
| Name: Razzaq Hubble Email: | |
| 8. Course Objectives | |
| **Course Objectives** | **Introducing the student to human rights, their objectives a development in different eras and the role of internatio organizations and public opinion in respecting and protect human rights .** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | **Theoretical lectures** |

| 10. Course Structure | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required Learning Outcomes** | **Unit / Subject Name** | **Method of education** | **Evaluation method** |
| 1 | 2 | Human Rights | Human rights - definition - objectives | Theoretical lectures | editorial |
| 2 | 2 | The roots and development of human rights in human history | The roots and development of human rights in human history - human rights in antiquity and medieval. | Theoretical lectures | editorial |
| 3 | 2 | Human Rights in Ancient Civilizations | Human rights in ancient civilizations, especially the civilization of Mesopotamia. | Theoretical lectures | editorial |
| 4 | 2 | Human rights in heavenly laws | Human rights in heavenly laws with a focus on human rights in Islam. | Theoretical lectures | editorial |
| 5 | 2 | Human rights in the Middle Ages | Human rights in the Middle Ages: Human rights in doctrines - schools and political theories - human rights in companies and their declarations - revolutions and constitutions (English documents - American Revolution - French Revolution - Russian Revolution) | Theoretical lectures | editorial |
| 6 | 2 | Human rights in contemporary and modern history | Human Rights in Contemporary and Modern History - International Recognition of Human Rights since | Theoretical lectures | editorial |

| | | | | | |
|---|---|---|---|---|---|
| | | | the First World War and the United Nations) | | |
| 7 | 2 | Regional recognition of human rights | Regional recognition of human rights - European Convention on Human Rights 1950 - American Convention on Human Rights 1969 - African Charter on Human Rights 1981 - Arab Charter for Human Rights 1994. | Theoretical lectures | editorial |
| 8 | 2 | NGOs and Human Rights | NGOs and human rights (ICRC-AI-Human Rights Watch) | Theoretical lectures | editorial |
| 9 | 2 | National Human Rights Organizations | National Human Rights Organizations | Theoretical lectures | editorial |
| 10 | 3 | Human rights in Iraqi constitutions | Human rights in Iraqi constitutions between theory and reality | Theoretical lectures | editorial |
| 11-12 | 2 | The relationship between human rights and public freedoms | The relationship between human rights and public freedoms:<br>1- In the Universal Declaration of Human Rights.<br>2- In regional charters and national constitutions. | Theoretical lectures | editorial |
| 13 | 2 | Essential human rights | Necessary human rights and collective human rights. | Theoretical lectures | editorial |
| 14 | 2 | Economic, social and cultural human rights and | Economic, social and cultural human rights | Theoretical | editorial |

| | | | | | |
|---|---|---|---|---|---|
| | | civil and political human rights | and civil and political human rights | lectures | |
| 15 | 2 | Modern human rights: facts in development - the right to a clean environment - the right to true solidarity. | Modern human rights: facts in development - the right to a clean environment - the right to true solidarity. | Theoretical lectures | editorial |
| 16 | 2 | Guarantees of respect and protection of human rights at the national level – guarantees in the Constitution and laws – guarantees in the principle of the rule of law. | Guarantees of respect and protection of human rights at the national level – guarantees in the Constitution and laws – guarantees in the principle of the rule of law. | Theoretical lectures | editorial |
| 17 | 2 | Guarantees in constitutional oversight - guarantees in freedom of the press Public opinion - the role of NGOs in respecting and protecting human rights. | Guarantees in constitutional oversight - guarantees in freedom of the press Public opinion - the role of NGOs in respecting and protecting human rights. | Theoretical lectures | editorial |
| 18 | 2 | Guarantees, respect and protection of human rights at the international level: The role of the United Nations and its specialized agencies in providing guarantees. | Guarantees, respect and protection of human rights at the international level: The role of the United Nations and its specialized agencies in providing guarantees. | Theoretical lectures | editorial |

| | | | | | |
|---|---|---|---|---|---|
| 19 | 2 | Role of regional organizations | The role of regional organizations - (League Arabic - European Union - African Union - Organization of American States - ASEAN) | Theoretical lectures | editorial |
| 20 | 2 | General theories of freedoms - the origin of rights and freedoms - the legitimate position of the declared rights and freedoms - the use of the term public freedoms. | General theories of freedoms - the origin of rights and freedoms - the legitimate position of the declared rights and freedoms - the use of the term public freedoms. | Theoretical lectures | editorial |
| 21 | 2 | The functional nature of the concept of public freedoms: philosophical considerations of the functional right - structural considerations of the positive right - economic considerations and public freedoms. | The functional nature of the concept of public freedoms: philosophical considerations of the functional right - structural considerations of the positive right - economic considerations and public freedoms. | Theoretical lectures | editorial |
| 22-23 | 2 | The legal basis of the rule of law | The legal basis of the rule of law | Theoretical lectures | editorial |
| 24 | 2 | Regulation of public freedoms by public authorities | Regulation of public freedoms by public authorities | Theoretical lectures | editorial |
| 25 | 2 | Non-judicial litigation or grievance | Non-judicial litigation or grievance | Theoretical lectures | editorial |

| | | | | | |
|---|---|---|---|---|---|
| 26 | 2 | Judicial appeal - determining the responsibility of the state for its legitimate implementation | Judicial appeal - determining the responsibility of the state for its legitimate implementation | Theoretical lectures | editorial |
| 27 | 2 | The effect of dual elimination on public freedoms Public freedoms under administrative jurisprudence | The effect of dual elimination on public freedoms Public freedoms under administrative jurisprudence | Theoretical lectures | editorial |
| 28 | 2 | Equality: the historical evolution of the concept of equality | Equality: the historical evolution of the concept of equality | Theoretical lectures | editorial |
| 29 | 2 | The modern development of the idea of equality | The modern development of the idea of equality | Theoretical lectures | editorial |
| 30 | 2 | Gender equality Equality between individuals according to their beliefs and member. | Gender equality Equality between individuals according to their beliefs and member. | Theoretical lectures | editorial |

| 11. Course Evaluation | |
|---|---|
| **Written exam + discussion** | |
| 12. Learning and Teaching Resources | |
| Required textbooks (methodology, if any | **None** |
| Main references (sources) | Human rights, democracy and public freedoms Dr. Maher Sabri Kazem |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library** |
| Electronic References, Websites | **Different sources of the Internet** |

# Mechanical Workshop

| |
|---|
| 1. Course Name |
| Mechanical Workshop/Laboratory |
| 2. Course Code |
| |
| 3. Semester / Year |
| Academic Year 2024/2025 (First Semester) |
| 4. The history of preparation of this description |
| 9/7/2024 |
| 5. Available Attendance Forms |
| Daily mandatory attendance |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 3Practical = 3 * 15 weeks = 45 hours per year |
| 7. Course administrator's name (if more than one name) |
| Name: Email : |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | 1- The student gets acquainted with the cold methods and working on the lathe.<br>2- Cuts metal with a cutting and punching machine.<br>**3-** Installs some simple structures. |

| | |
|---|---|
| 9. Teaching and Learning Strategies | |
| **Strategy** | **Practical experience , practical test , review** |

10. Course Structure

**Turning Workshop**

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1 | **3** | **Learn how to use different measuring devices.** | **Turning Workshop** | **Workshop** | **Daily Exam** |
| 2 | **3** | **Learn how to use the micro MittR.** | | | **Daily Exam** |
| 3 | **3** | **Learn about the different parts of the lathe and how to operate them, install a circular section on the lathe and perform a straight turning.** | | | **Daily Exam** |
| 4 | **3** | **Perform an exercise that is included and has** | | | **Daily Exam** |

| | | | | | |
|---|---|---|---|---|---|
| | | **an internal tuberculosis hole.** | | | |
| 5 | **3** | **Doing an exercise in which there is an external and internal hole.** | | | **Daily Exam** |
| **Filing Workshop** | | | | | |
| **6** | **3** | **Learn about the File process, types of files and measuring tools used.** | **file Workshop** | **Workshops** | **Daily Exam** |
| **7** | **3** | **Perform a surface leveling exercise.** | | | **Daily Exam** |
| **8** | **3** | **Make a square exercise.** | | | **Daily Exam** |
| **Plumbing Workshop** | | | | | |
| **9** | **3** | **Learn about the plumbing process, types of plates and plate tools.** | **Plumbing Workshop** | **Workshops** | **Daily Exam** |
| **10** | **3** | **Scoop work.** | | | **Daily Exam** |
| **11** | **3** | **The work of a flame diffuser.** | | | **Daily Exam** |
| **Welding workshop** | | | | | |
| **12** | **3** | **Learn about gas welding and its devices.** | **Welding workshop** | **Workshops** | **Daily Exam** |
| **13** | **3** | **Perform a welding exercise for two adjacent pieces using gas welding.** | | | **Daily Exam** |
| **14** | **3** | **Learn about electric arc welding and its devices.** | | | **Daily Exam** |
| **15** | **3** | **Perform a welding exercise of two perpendicular pieces using an electric arc** | | | **Daily Exam** |
| 11. Course Evaluation | | | | | |
| **Daily tests, classroom activity and participation** | | | | | |
| 12. Learning and Teaching Resources | | | | | |
| Required textbooks (methodology, if any) | **None** | | | | |

# Electronic Computer Maintenance Workshop

| |
|---|
| 1. Course Name |
| Electronic Computer Maintenance Workshop |
| 2. Course Code |
| |
| 3. Semester / Year |
| Academic Year 2024/2025 (Second Semester) |
| 4. The history of preparation of this description |
| 9/7/2024 |
| 5. Available Attendance Forms |
| Daily mandatory attendance |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 3Practical = 3 * 15 weeks = 45 hours per year |
| 7. Course administrator's name (if more than one name) |
| Name: Alaa Abd Ali Hadi Email: alaa@atu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | The student acquires skill in the field of electronic computer maintenance by teaching the student on the methods used in maintenance and the importance of components, then training the student with practical experiments on devices Various electronic Computer. |
| 9. Teaching and Learning Strategies | |
| **Strategy** | Through the workshop, the student learns about computer parts and how to do maintenance for idle parts. |

10. Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| **1** | **3** | **Basic principles and basic purpose of Computer maintenance - the most important number used in Computer maintenance.** | **Electronic Computer Maintenance Workshop** | **Workshop** | **Daily Exam** |
| **2** | **3** | **The basic components of the electronic Computer (Hardware and Software).** | | | **Daily Exam** |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 3 | Fault analysis – types of maintenance (periodic, fault maintenance, causes of malfunctions, preventive maintenance) | | | Daily Exam |
| 4 | 3 | Power supply – types of power supply chips – fan malfunctions with solutions. | | | Daily Exam |
| 5 | 3 | The motherboard (system board ) and its important settings , the most important malfunctions and solutions. | | | Daily Exam |
| 6 | 3 | The microprocessor of the Computer and its most important types - RAM - types and sizes of RAM memory and how to install it - the most important malfunctions and solutions. | | | Daily Exam |
| 7 | 3 | Computer cards (graphics card, sound card, input and output cards...) And the most important malfunctions of its own and ways to address them | | | Daily Exam |
| 8 | 3 | - Hard disks types and sizes - floppy disks - CDs and their types (DVD, CD) - flash memory.<br>- How to repair a hard drive | | | Daily Exam |
| 9 | 3 | Terminals (screen and its types - keyboard - mouse - speakers - printer - camera .... etc). | | | Daily Exam |
| 10 | 3 | The most important malfunctions of | | | Daily Exam |

| | | | | | |
|---|---|---|---|---|---|
| | | **terminals and methods of their maintenance** | | | |
| **11** | **3** | **Important software for the electronic Computer - initial settings ProgramsC Basic Operating System BIOS.** | | | **Daily Exam** |
| **12** | **3** | **Disk Formatting - The process of partitioning the hard disk.** | | | **Daily Exam** |
| **13** | **3** | **Installing the Window operating system and antiviruses and how to update them with other important software.** | | | **Daily Exam** |
| **14** | **3** | **-The most important malfunctions of the Windows operating system and how to address them**<br>**- The most important software malfunctions accompanying the system.** | | | **Daily Exam** |
| **15** | **3** | **-Types of viruses and how to deal with them.**<br>**- Sequential final steps for computer maintenance.** | | | **Daily Exam** |

| 11. Course Evaluation | |
|---|---|
| Daily Tests , Classroom Activity & Participation , Reports | |
| 12. Learning and Teaching Resources | |
| Required textbooks (methodology, if any) | **None** |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# Computer Networks

| | |
|---|---|
| 1. Course Name | |
| Computer Networks / Phase II | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical + 2 practical = 4 * 30 weeks = 120 annual hours | |
| 7. Course administrator's name (if more than one name) | |
| Name: Alaa Abd Ali Hadi Email: alaa@atu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | **General Objective: Providing the student with a skill in network and communication sciences**<br>**Cognitive goals**<br>**1- To introduce the student to the tools and devices involved in building networks.**<br>**2- To introduce the student to the types of networks in terms of design.**<br>**3- To introduce the student to the rules and laws that control the mechanism of communication between computers.**<br>**4- To introduce the student to the open communication systems of computer networks.**<br>**Course skills objectives.**<br>**1- Building computer networks.**<br>**2- Learn to manage computer networks.**<br>**Emotional and value goals**<br>**1- The student should know the types of modern networks of different types, importance and tasks they perform.**<br>**2- Instilling confidence in the same student in the field of building, maintaining and managing computer networks.**<br>**3- Making the student communicate with the outside world.**<br>**3- The student should pay attention to the correct rules in building computer networks.**<br>**4- The student should learn the maintenance of computer networks.**<br>**5- The student should realize the importance of computer networks in various fields.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | **Theoretical + practical application** |

## 10.Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| **1** | **4** | Data communication system :d efinition – basic components of data communication system – the data communication network application of communication Network | Data communication system | **Theoretical + practical lectures** | **Editorial + Practical** |
| **2** | **4** | Basic communication concept and hard ware: mode of transmission – data flow. Physical connection – timing – standard digit code communication controls. Information separator. | Basic communication concept and hard ware | **Theoretical + practical lectures** | **Editorial + Practical** |
| **3** | **4** | Modems – definition – type of modems – (optical –short haul- acoustic- smart- Digital –v.34 modem). Wires modem - features of modems . ISDN technology (integrated services digital network ) | Modems | **Theoretical + practical lectures** | **Editorial + Practical** |
| **4** | **4** | Network interfaces card OR network adapter cards – definition – explain how its Work to prepair data .talling & setting up network cards | Network interfaces card OR network adapter cards | **Theoretical + practical lectures** | **Editorial + Practical** |
| **5** | **4** | Protocol fundamentals: definition – the protocol function in the- Sender and receiver devices. The connection oriented – the connectionless. | Protocol fundamentals | **Theoretical + practical lectures** | **Editorial + Practical** |
| **6** | **4** | TCP / IP (transmission control protocol / internet protocol). Smtp – ftp – snmp – telnet. Hdlc (high-level data link control) protocol. Ppp (point to point )protocol | TCP / IP (transmission control protocol / internet protocol). Smtp – ftp – snmp – telnet. Hdlc (high-level data | **Theoretical + practical lectures** | **Editorial + Practical** |

| | | | | | |
|---|---|---|---|---|---|
| | | | link control) protocol. Ppp (point to point )protocol | | |
| **7** | **4** | Arp (address resolution protocol). Rarp (reverse address resolution protocol). | Arp , Rarp | **Theoretical + practical lectures** | **Editorial + Practical** |
| **8** | 4 | OSI open system interconnect –definition – the benefits of OSI. The OSI 7 layers – explain each layers – compare between OSI and TCP / IP model. | OSI open system interconnect | **Theoretical + practical lectures** | **Editorial + Practical** |
| **9** | 4 | Addressing IP – class full addressing –classless inter-domain routing (Cidr). Network address | Addressing IP – class full addressing – classless inter-domain routing (Cidr). Network address | **Theoretical + practical lectures** | **Editorial + Practical** |
| **10** | 4 | Transport layer protocols : UDP (user datagram protocol) & TCP (transmission control protocol). Data link protocol: IP – ARP – ICMP (internet control message Protocol). | Transport layer protocols | **Theoretical + practical lectures** | **Editorial + Practical** |
| **11** | 4 | Signal transmission fundamentals - definition. Analog and digital signals Electromagnetic waves. | Signal transmission fundamentals | **Theoretical + practical lectures** | **Editorial + Practical** |
| **12** | 4 | Data packets (frames) – definition – explain how to make apackets. Transmission the packets among the networks. Cyclical redundancy check CRC. | Data packets (frames) | **Theoretical + practical lectures** | **Editorial + Practical** |
| **13** | 4 | Communication media: circuit media – guided media – twisted Pair cable – coaxial cable – optical fiber. | Communication media | **Theoretical + practical lectures** | **Editorial + Practical** |
| **14** | **4** | Un guided media – microwave – satellite transmission. | Un guided media – microwave – satellite transmission. | **Theoretical + practical lectures** | **Editorial + Practical** |

| | | | | | |
|---|---|---|---|---|---|
| **15** | **4** | The concept of network – benefits of networking – Peer TO peer network – server/client network. The operating system of network. | The concept of network | **Theoretical + practical lectures** | **Editorial + Practical** |
| **16** | 4 | Types of network: local area networks LAN – definition – benefits. Characteristics – LAN components (hard ware & software). LAN configurations : baseband & broad band networks | Types of network | **Theoretical + practical lectures** | **Editorial + Practical** |
| **17** | 4 | Extended local area network – Wireless LAN bridge – Long range wireless bridge | Extended local area network – Wireless LAN bridge – Long range wireless bridge | **Theoretical + practical lectures** | **Editorial + Practical** |
| **18** | 4 | Wide area network – Metropolitan area network. | Wide area network – Metropolitan area network | **Theoretical + practical lectures** | **Editorial + Practical** |
| **19** | 4 | LAN (local area networks) protocols - LLC protocol - Wide area network protocol. | LAN (local area networks) protocols - LLC protocol- Wide area network protocol | **Theoretical + practical lectures** | **Editorial + Practical** |
| **20** | 4 | Network topology – ring – bus – star – hybrid – Packet data network (PDNs). | Network topology – ring – bus – star – hybrid – Packet data network (PDNs). | **Theoretical + practical lectures** | **Editorial + Practical** |
| **21** | **4** | Network interconnectivity – Connecting hybrid networks – bridges – routers – brouters Gateways – repeaters – HUB – switches. | Network interconnectivity – Connecting hybrid networks – bridges – routers – brouters Gateways – repeaters – HUB – switches. | **Theoretical + practical lectures** | **Editorial + Practical** |
| **22** | **4** | Network access methods: access methods – explain CSMA / CA, CSMA / CD Explain the demand priority. | Network access methods: | **Theoretical + practical lectures** | **Editorial + Practical** |

| | | | | | |
|---|---|---|---|---|---|
| **23** | 4 | Token passing : explain the token passing – Token ring network | Token passing | **Theoretical + practical lectures** | **Editorial + Practical** |
| **24** | 4 | Routable and no routable protocol : Dynamic routing fundamentals, Autonomous system (AS) - Routing protocol type . | Routable and no routable protocol | **Theoretical + practical lectures** | **Editorial + Practical** |
| **25** | 4 | IP Address class – private IP address- Dynamic NAT Static NAC Over loading NAT | IP Address class – private IP address- Dynamic NAT Static NAC Over loading NAT | **Theoretical + practical lectures** | **Editorial + Practical** |
| **26** | **4** | Switching concept - Sending and receiving frames using switch. | Switching concept | **Theoretical + practical lectures** | **Editorial + Practical** |
| **27** | **4** | Multiplexer- functions- techniques- frequency- division Multiplexing – Time division multiplexing (TDM) Statical time division multiplexer (STDM) | Multiplexer- functions- techniques- frequency- division Multiplexing – Time division multiplexing (TDM) Statical time division multiplexer (STDM) | **Theoretical + practical lectures** | **Editorial + Practical** |
| **28** | **4** | Wireless network : definition – System interconnection – wireless LANs – Wireless WANs - | Wireless network | **Theoretical + practical lectures** | **Editorial + Practical** |
| **29** | **4** | Ethernet network fundamentals : Ethernet types (10 base f- 10 base T- 10 base2 – 10 base5) | Ethernet network fundamentals | **Theoretical + practical lectures** | **Editorial + Practical** |
| **30** | **4** | Dynamic host configuration protocol (DHCP) - | Dynamic host configuration protocol (DHCP) - | | **Editorial + Practical** |

| 11. Course Evaluation | |
|---|---|
| **Discussion + exams (daily - quarterly - final)** , reports | |
| 12. Learning and Teaching Resources | |
| Required textbooks (methodology, if any) | **None** |
| Main references (sources) | ❖ Introduction to Computer Networks / Dr. Mahmoud Iskandarani<br>❖ Intranets / Infrastructure<br>❖ Dr. Ammar Khair Bey / Eng. Hossam Al-Mulhim<br>❖ data communications and N.W fundamentals using novel NetWare<br>Emilio Ramos , al Schroder ,Ann Buhler |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# Intelligent Systems

| | |
|---|---|
| 1. Course Name | |
| Smart Systems / Phase II | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical = (2 * 30) = 60 annual hours | |
| 7. Course administrator's name (if more than one name) | |
| Name: Hamed Mahmoud<br>Email: hamid.shakir.isa5@atu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | **- The student should be able to know the applications of smart systems and their uses in scientific life**<br>**- Learn the basic rules of intelligent systems and learn about the basic programming languages used**<br>**Smart Systems**<br>**Cognitive goals**<br>**1- Knowing the importance of smart systems through examples.**<br>**2- A detailed explanation of the applications of smart systems with examples.**<br>**3- Studying the types of programming languages used in smart systems.**<br>**4- Understand how to represent and implement smart systems in a computer.**<br>**Course skills objectives.**<br>**1 – Develops the student's skill in solving the problem and writing solution algorithms.**<br>**2 – Trains to download C++ on the computer.**<br>**3- Compare through programming sentences between C and C++.**<br>**Emotional and value goals**<br>**1- Aware of the importance of identifying the types of smart systems in order to keep pace with the development in the digital world**<br>**That affected the development of his country.**<br>**2- Convinced of the importance of this and urges him to strive to develop his scientific level.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | **Teach the student to write steps to make a system in a field with writing an algorithm.** |

## 10. Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1-2 | 2 per week | Introduction | Introduction | Theoretical lectures | editorial |
| 3 | 2 per week | Artificial Network ( introduction, historical view) | Artificial Network | Theoretical lectures | editorial |
| 4-6 | 2 per week | The neuron<br>- Biological neuron<br>- Simulated neuron<br>- Types of nonlinearities | The neuron | Theoretical lectures | editorial |
| 7-8 | 2 per week | Types of ANNs (Artificial Neural Network)<br>- Feed forward ANNs<br>- Feedback NNs<br>Supervised and unsupervised ANNs | Types of ANNs (Artificial Neural Network) | Theoretical lectures | editorial |
| 9-11 | 2 per week | Learning Algorithms<br>- Basic Delta Rule<br>- Back propagation<br>- Counter propagation<br>Associative memory | Learning Algorithms | Theoretical lectures | editorial |
| 12-13 | 2 per week | Architectures<br>- Hopfield NN<br>- Kohonin NN<br>- Carpenter and Grossberg<br>Neocognitron | Architectures | Theoretical lectures | editorial |
| 14-15 | 2 per week | Applications<br>Image processing and classification | Applications | Theoretical lectures | editorial |
| 16 | 2 per week | Introduction to Fuzzy logic | Introduction to Fuzzy logic | Theoretical lectures | editorial |

| | | | | | |
|---|---|---|---|---|---|
| **17** | **2 per week** | **Fuzzy algorithms** | **Fuzzy algorithms** | **Theoretical lectures** | **editorial** |
| **18-19** | **2 per week** | **Fuzzy sets:<br>- Continues fuzzy sets<br>Discrete Fuzzy sets** | **Fuzzy sets** | **Theoretical lectures** | **editorial** |
| **20-21** | **2 per week** | **Logical operation<br>- Fuzzy intersection<br>- Fuzzy implication<br>Fuzzy union** | **Logical operation** | **Theoretical lectures** | **editorial** |
| **22** | **2 per week** | **Compositional rule of inference ( continuous and discrete)** | **Compositional rule of inference ( continuous and discrete)** | **Theoretical lectures** | **editorial** |
| **23** | **2 per week** | **Defuzzification** | **Defuzzification** | **Theoretical lectures** | **editorial** |
| **24** | **2 per week** | **Introduction and historical view of Genetic Algorithms** | **Introduction and historical view of Genetic Algorithms** | **Theoretical lectures** | **editorial** |
| **25-26** | **2 per week** | **Component of Genetic algorithm<br>- Selection method<br>Operators** | **Component of Genetic algorithm** | **Theoretical lectures** | **editorial** |
| **27** | **2 per week** | **• Crossover<br>• Mutation** | **• Crossover<br>• Mutation** | **Theoretical lectures** | **editorial** |
| **28** | **2 per week** | **- Parameters of GA<br>- GA and search method** | **- Parameters of GA<br>- GA and search method** | **Theoretical lectures** | **editorial** |
| **29-30** | **2 per week** | **-Genetic programming<br>-Applications** | **-Genetic programming<br>-Applications** | **Theoretical lectures** | **editorial** |

## 11. Course Evaluation

**Daily Tests / Classroom Activity and Participation / Semester Exams**

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (methodology, if any | **None** |
| Main references (sources) | **1. Jaeek M.Zurada, "Introduction to Artificial Neural Systems", 1996** |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# Programming in Visual Basic and Access databases

| | |
|---|---|
| 1. Course Name | |
| Programming in Visual Basic and Access databases / Phase II | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 1 theoretical + 3 practical = 4 * 30 weeks = 120 annual hours | |
| 7. Course administrator's name (if more than one name) | |
| Name: Beida Hadi Mohamed<br>Email: ins.byd44@atu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | **General Objective: The student acquires the skills of writing programs in Visual Basic, using Access databases, and how to link the two.**<br>**Cognitive goals**<br>**1- The student can write program codes in Visual Basic and how to manage and modify them.**<br>**2- The student creates different applications using the Visual Basic code.**<br>**3- The student connects the programs with the various practical applications through the Visual Basic environment.**<br>**Course skills objectives.**<br>**1 - The student can manage the windows of programs operating with the Windows system and how to deal with them.**<br>**2 – The student learns to control applications through the Visual Basic code.**<br>**3 – The student links the programs created by Visual Basic with practical applications.**<br>**Emotional and value goals**<br>**1- Theoretical lectures.**<br>**2- Applied skills within the laboratory.**<br>**3- Discussion in the classroom.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | **- Presentation of lectures by data show.**<br>**- Use smart blackboards.**<br>**- Discussions and seminars that students are assigned to prepare.**<br>**- Reports for various topics that students are assigned to prepare.** |

## 10.Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| **1** | **4** | How to install the program vb.6 /Getting to know the program window VB.6 environment How to choose new project /Project naming and storage | How to install VB.6 / Familiarize yourself with the program window | **Theoretical + practical lectures** | **Editorial + Practical** |
| **2** | **4** | The menu bar (file,edit,view,help... etc.) /Few functions to programming (debug,run,project... etc.) | The menu bar | **Theoretical + practical lectures** | **Editorial + Practical** |
| **3** | **4** | Learn about the contents of the toolbar and the tasks of each tool | Learn about the contents of the toolbar and the tasks of each tool | **Theoretical + practical lectures** | **Editorial + Practical** |
| **4** | **4** | How to show the properties window/ how to set properties for each object and the importance of setting properties | How to show the properties window/ how to set properties for each object and the importance of setting properties | **Theoretical + practical lectures** | **Editorial + Practical** |
| **5** | **4** | Learn about the tools in the tool box and the function of each tool / how to move each tool and put it on the form The project explorer | Learn about the tools in the toolbox | **Theoretical + practical lectures** | **Editorial + Practical** |
| **6** | **4** | Setting properties Setting properties of object at design time Setting objects properties when designing | Setting characteristics | **Theoretical + practical lectures** | **Editorial + Practical** |
| **7** | **4** | Related properties /command buttons /text boxes Checkbox /combo box | Related properties | **Theoretical + practical lectures** | **Editorial + Practical** |
| **8** | **4** | Control events/ events procedure(code) Events procedure structure Setting properties at run time | Control events/ events procedure(code) Events procedure structure Setting | **Theoretical + practical lectures** | **Editorial + Practical** |

| | | | | | |
|---|---|---|---|---|---|
| | | | properties at run time | | |
| **9** | **4** | Creating new visual basic project Learn about the basic steps in creating a new project through the application of creating a simple project Project "hello" | Learn about the basic steps in creating a new project | **Theoretical + practical lectures** | **Editorial + Practical** |
| **10** | **4** | Variables and constants / constants and variables and their importance Rules used in naming variables Rules used in naming variablesData types Variables and their types | Constants and variables and their importance | **Theoretical + practical lectures** | **Editorial + Practical** |
| **11** | **4** | Variables declaration by using dim statement Declare variables using the dim statement and how to clarify the data type and point the name of the variable /Constants /comment statements the | declare variables using dim | **Theoretical + practical lectures** | **Editorial + Practical** |
| **12** | **4** | Example: build the Computer program Build a Computer model with an indication of the importance of having the val function | Example | **Theoretical + practical lectures** | **Editorial + Practical** |
| **13** | **4** | Building a speed measurement model example (speed program) With an indication of the importance of the presence of the str function in the application | Building a speed measurement model<br><br>example (speed program) With an indication of the importance of the presence of the str function in the application | **Theoretical + practical lectures** | **Editorial + Practical** |

| | | | | | |
|---|---|---|---|---|---|
| **14** | **4** | Visual basic statement –visual basic branching – if statements<br>1- The if/then statement<br>2-the if/then/else/end if block<br>3- the if/then/else if/then/else/end if block | Visual Basic statement | **Theoretical + practical lectures** | **Editorial + Practical** |
| **15** | **4** | Loops statements in visual basic For....next loop<br><br>Rotary for its general formula and how it works | Loops statements in visual basic | **Theoretical + practical lectures** | **Editorial + Practical** |
| **16** | **4** | Do while/loop---do until/loop---do/loop while---do/loop untile Build a template for each app | Do while/loop---do until/loop---do/loop while---do/loop untile | **Theoretical + practical lectures** | **Editorial + Practical** |
| **17** | **4** | Input box functions/ Example (build the input box program to find average of 10 Degree | Input box functions | **Theoretical + practical lectures** | **Editorial + Practical** |
| **18** | **4** | General formula for msgbox functions / Example (build the msgbox to end the program ) | msgbox functions | **Theoretical + practical lectures** | **Editorial + Practical** |
| **19** | **4** | Mid functions /instr functions /val functions /mod functions Str functions / like functions /len functions The general formula for each function with an application for each case | Mid functions /instr functions /val functions /mod functions Str functions / like functions /len functions | **Theoretical + practical lectures** | **Editorial + Practical** |
| **20** | **4** | Arrays and how to define them in the program/ single arrays: Read a single matrix consisting of a certain number of one dimension elements and then find the sum of even elements. | Holiday Inn Residence | **Theoretical + practical lectures** | **Editorial + Practical** |

| | | | | | |
|---|---|---|---|---|---|
| **21** | **4** | two dimension array<br>It defines a two-dimensional matrix consisting of 5 columns and 5 rows, finds the largest number in the matrix and finds the sum of the diagonal axis of the two dimension array<br>It defines a two-dimensional matrix consisting of 5 columns and 5 rows, finds the largest number in the matrix and finds the sum of the diagonal axis of the matrix | two dimension array | **Theoretical + practical lectures** | **Editorial + Practical** |
| **22** | **4** | Understanding access basics /getting started with a data base Identifying parts of the access screen/working with objects/ Working with tables/working with multiple tables/editing records in tables | Understanding access basics /getting started with a data base Identifying parts of the access screen/working with objects/ Working with tables/working with multiple tables/editing records in tables | **Theoretical + practical lectures** | **Editorial + Practical** |
| **23** | **4** | Adding and editing data(adding and deleting records in tables)/using editing command/adding records with a form/ Printing a form/editing data in a form | Adding and editing data | **Theoretical + practical lectures** | **Editorial + Practical** |
| **24** | **4** | Finding and sorting records /using the find commands/Find records using match case and any part of field Find records using the asterisk(*) Find records using the question mark (?) /sorting records | Finding and sorting records | **Theoretical + practical lectures** | **Editorial + Practical** |

| | | | | | |
|---|---|---|---|---|---|
| **25** | **4** | Adding tables to a database/creating table using wizard Creating tables in design view / Creating tables in datasheet view | Adding tables to a database/creating table using wizard Creating tables in design view / Creating tables in datasheet view | **Theoretical + practical lectures** | **Editorial + Practical** |
| **26** | **4** | Adding forms to a database /creating auto forms Using the form wizard / creating form in design view Creating a form from tables window | Adding forms to a database /creating auto forms Using the form wizard / creating form in design view Creating a form from tables window | **Theoretical + practical lectures** | **Editorial + Practical** |
| **27** | **4** | Getting information from a database /Designing queries /using joins and relationships | Getting information from a database /Designing queries /using joins and relationships | **Theoretical + practical lectures** | **Editorial + Practical** |
| **28** | **4** | Creating a multiple table query Creating relationships :(one to one ) (many to many ) ( one to many ) | Creating a multiple table query Creating relationships | **Theoretical + practical lectures** | **Editorial + Practical** |
| **29-30** | **4** | Create a program in the Visual Basic language and link it with a database built using rules<br>Access data An example of this is an electronic library system. | Create a program in the Visual Basic language and link it with a database built using rules<br>Access Data | **Theoretical + practical lectures** | **Editorial + Practical** |

## 11.Course Evaluation

1- Pre- and post-exams for each subject.
2- Evaluation of the student's activities for various topics periodically.
3- Evaluate students for the projects they are assigned to.
4- Final exams for a set of study modules and periodically.

## 12.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (methodology, if any | **None** |

| | |
|---|---|
| Main references (sources) | ❖ Microsoft Visual Basic 6.0professional. , Michelle Halverson, 1998<br>❖ Visual Basic 6.0 Dr . Yahya Sabri Al-Halabi Mohamed Bilal Al-Zoubi<br>❖ Visual Basic 6 programming data base, translated and prepared by Dr. Aziz Esber / Dr. Ali Suleiman |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of t Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# English Language

| | |
|---|---|
| 1. Course Name | |
| English Language / Second Stage | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 1 theoretical = 1 * 30 weeks = 30 hours per year | |
| 7. Course administrator's name (if more than one name) | |
| Name: Suad Abdel Allah | Email : |
| 8. Course Objectives | |
| **Course Objectives** | **The student's review of the simplified basic rules of the English language, which he has already studied in the previous stages, but at length, as well as gradually introducing the student to the atmosphere of technical l terms related to technological specialization in its various branches.**<br>**Cognitive goals**<br>**1- Introducing the student to English grammar.**<br>**2- Introducing the student to the most important vocabulary of the Engl language.**<br>**Course skills objectives.**<br>**1 – English speaking skills.**<br>**Emotional and value goals**<br>**1- Theoretical lectures.**<br>**2- Discussion in the classroom.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | Theoretical lectures + practical dialogue |

| 10. Course Structure | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required Learning Outcomes** | **Unit / Subject Name** | **Method of education** | **Evaluation method** |
| **1-2** | **1** | **What is your name? What is this in English? Translation Every day English Plurals** | **What is your name? What is this in English? Translation Every day English Plurals** | **Theoretical lectures** | **editorial** |
| **3-4** | **1** | **Countries Pronunciation Cities and countries Where are you from? reading listening Tran station** | **Countries Pronunciation Cities and countries Where are you from? reading listening Tran station** | **Theoretical lectures** | **editorial** |
| **5-6** | **1** | **Jobs ,negatives Address , trans pronunciation , listening , reading** | **Jobs ,negatives Address , trans pronunciation , listening , reading** | **Theoretical lectures** | **editorial** |
| **7-8** | **1** | **The family possessive s listening vocabulary pronunciation translation** | **The family possessive s listening vocabulary pronunciation translation** | **Theoretical lectures** | **editorial** |
| **9-10** | **1** | **Sports present simple transition vocabulary and pronunciation** | **Sports present simple transition vocabulary and pronunciation** | **Theoretical lectures** | **editorial** |
| **11-12** | **1** | **The time present simple negative translation vocabulary listening writing** | **The time present simple negative translation vocabulary listening writing** | **Theoretical lectures** | **editorial** |
| **13-14** | **1** | **Object pronouns listening vocabulary translation reading** | **Object pronouns listening vocabulary translation reading** | **Theoretical lectures** | **editorial** |
| **15-16** | **1** | **Furniture pronunciation prepositions reading and writing translation directions** | **Furniture pronunciation prepositions reading and writing translation directions** | **Theoretical lectures** | **editorial** |

| | | | | | |
|---|---|---|---|---|---|
| **17-18** | **1** | **Saying yers writing past simple irregular verbs translation vocabulary word groups** | **Saying yers writing past simple irregular verbs translation vocabulary word groups** | **Theoretical lectures** | **editorial** |
| **19-20** | **1** | **Past simple regular verbs pronunciation irregular verbs listening translation vocabulary reading everyday English** | **Past simple regular verbs pronunciation irregular verbs listening translation vocabulary reading everyday English** | **Theoretical lectures** | **editorial** |
| **21-22** | **1** | **Activities listening pronunciation reguests and offers translation vocabulary everyday English** | **Activities listening pronunciation reguests and offers translation vocabulary everyday English** | **Theoretical lectures** | **editorial** |
| **23-24** | **1** | **Translation reading writing pronunciation every day English** | **Translation reading writing pronunciation every day English** | **Theoretical lectures** | **editorial** |
| **25-26** | **1** | **Colours present continuos present simple and present continuous translation reading vocabulary everyday English** | **Colours present continuos present simple and present continuous translation reading vocabulary everyday English** | **Theoretical lectures** | **editorial** |
| **27-30** | **1** | **Present continuous for future listing pronunciation translation vocabulary reading and listening everyday English** | **Present continuous for future listing pronunciation translation vocabulary reading and listening everyday English** | **Theoretical lectures** | **editorial** |

| | |
|---|---|
| 11.Course Evaluation | |
| Daily Tests , Classroom Activity and Participation , Semester Exams | |
| 12.Learning and Teaching Resources | |
| Required textbooks (methodology, if any | **None** |
| Main references (sources) | **1. Jaeek M.Zurada, "Introduction to Artificial Neural Systems", 1996** |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# Communication Systems

| |
|---|
| 1. Course Name |
| Communication Systems / Phase II |
| 2. Course Code |
| |
| 3. Semester / Year |
| Academic Year 2024/2025 |
| 4. The history of preparation of this description |
| 9/7/2024 |
| 5. Available Attendance Forms |
| Daily mandatory attendance |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 2 theoretical +2 practical = 4 * 30 weeks = 120 annual hours |
| 7. Course administrator's name (if more than one name) |
| Name: Ahmed Abdul Kazem Email: hamid.shakir.isa5@atu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | **General Objective: Teaching students and giving them an overview of modern communication systems, including the basics of communications, the concepts of waves, satellites, transmission lines, modern telecommunications networks, and future developments of these systems and international bodies regulating them.**<br>**Cognitive goals**<br>**1- Identify communication systems and their importance through examples.**<br>**2- Sees how the transmitter and reception system works in detail.**<br>**3. Be able to extract important information from signals transmitted through outer space.**<br>**4- Forming a picture of the methods of communication via mobile as well as via satellite .**<br>**5. Examine the obstacles to the transmission of information through outer space.**<br>**Course skills objectives.**<br>**1- Comparison between different communication systems through their quantitative properties.**<br>**1- Training on loading the radio signal with capacitive and frequency modulation systems.3- Provide them with practical problem-solving skills related to various communication systems and computer programs for communication systems.**<br>**Emotional and value goals**<br>**1- Increasing the student's ability to think about ways to deal with modern communication devices.**<br>**2- Helping the student to think about the importance of frequency, energy and power of the wave and time periods.** |

| |
|---|
| 9. Teaching and Learning Strategies |

| | |
|---|---|
| **Strategy** | **1- The teacher gives detailed theoretical lectures and compares them with practical experiences.**<br>**2- The teacher requests periodic reports on the basic topics of the subject.**<br>**3- The teacher forms discussion panels from students to solve the required problems and exercises.** |

| 10.Theoretical Course Structure | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required Learning Outcomes** | **Unit / Subject Name** | **Method of education** | **Evaluation method** |
| **1-3** | **2** | **<u>Introduction</u> Introduction to communication systems, classification of signals and systems, review of Fourier's series, Fourier transforms, frequency and impulse responses of linear systems, Fourier transform properties.** | **Introduction** | **Theoretical + practical lectures** | **Daily exam** |
| **4-5** | **2** | **<u>Noise</u> Types of noise, noise figure, S/N ratio, noise temperature.** | **Noise** | **Theoretical lectures** | **Daily exam** |
| **6-9** | **2** | **The concept of embedding - the concept of coding information and techniques used several signals on one channel - patterns of data transmission - explaining the concept of waves, their characteristics and methods of propagation, and reviewing antennas and their properties as a means of capturing or radiating waves.** | **The concept of inclusion** | **Theoretical lectures** | **Daily exam** |
| **10-13** | **2** | **Addressing transmission lines, including: types of wired and wireless transmission lines as one of the basic components of any communication and signal transmission system, with an** | **Addressing transmission lines** | **Theoretical lectures** | **Daily exam** |

| | | | | | |
|---|---|---|---|---|---|
| | | **explanation of the basics of transmission lines and their general characteristics - the concept of optical cable and how to include and transmit the signal in it and general characteristics - explaining the concept of networks and how modern networks and communications are classified.** | | | |
| **14-17** | **2** | **- Wireless communication systems: an overview of their development**<br><br>**- Explain the most important systems of modern wireless communication networks, their components, functions, characteristics, practical and security applications provided by these systems.**<br><br>**- Addressing the most important types of modern communications, including smart transport networks and networks of high platform stations.**<br><br>**- Presenting the international bodies concerned with supervising the organization and** | **Wireless Communication Systems** | **Theoretical lectures** | **Daily exam** |

| | | | | | |
|---|---|---|---|---|---|
| | | development of modern communication technologies according to unified standards and standards, and giving a historical overview of the International Telecommunication Union with mentioning its objectives and tasks. | | | |
| 18-20 | 2 | Pulse Modulation Sampling theorem, Pulse Amplitude Modulation (PAM), Time Division Multiplexing (TDM), Pulse Position and Pulse Width Modulation (PPM and PWM). | Pulse Modulation | Theoretical lectures | Daily exam |
| 21-26 | 2 | Digital Modulation Pulse Code Modulation (PCM), noise consideration in PCM system, S/N performance of PCM, Limitation and Modifications of PCM, Amplitude Shift Keying (ASK), FSK, PSK, Coherent and Nontolerant Detection, Differential PSK (DPSK), QAM, QPSK, MSK, MFSK, Comparison between performance of Digital Modulation types, Band Width Efficiency, Power Spectra of Modulated Signals, and Carrier Recovery. | Digital Modulation | Theoretical lectures | Daily exam |
| 27-30 | 2 | Antenna | Antenna | Theoretical lectures | Daily exam |

| | | | | | |
|---|---|---|---|---|---|
| | | Definition of antennas, types of antennas, main properties of antenna, radiation pattern (directivity, gain, efficiency, half-power, polarization), Array antennas. | | | |

Course Structure - Practical

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1 | 2 | LPF & HPF Passive and Active Circuits Design. | LPF & HPF Passive and Active Circuits Design. | Experiment | Daily exam |
| 2 | 2 | BPF & BSF Passive and Active Circuits Design. | BPF & BSF Passive and Active Circuits Design. | Experiment | Duty to report |
| 3 | 2 | Amplitude Modulation (AM) Circuit. | Amplitude Modulation (AM) Circuit. | Experiment | Duty to report |
| 4 | 2 | AM Detection Circuit. | AM Detection Circuit. | Experiment | Duty to report |
| 5 | 2 | Generation of DSB-SC Amplitude Modulation (Cowan Modulator Circuit). | Generation of DSB-SC Amplitude Modulation (Cowan Modulator Circuit). | Experiment | Duty to report |
| 6 | 2 | Generation of DSB-SC Amplitude Modulation (Ring Modulator Circuit). | Generation of DSB-SC Amplitude Modulation (Ring Modulator Circuit). | Experiment | Duty to report |
| 7 | 2 | SSB- SC Amplitude Modulation & Demodulation. | SSB- SC Amplitude Modulation & Demodulation. | Experiment | Duty to report |
| 8 | 2 | DSB/ SSB AM Transmitter. | DSB/ SSB AM Transmitter. | Experiment | Duty to report |
| 9 | 2 | DSB/ SSB AM Receiver. | DSB/ SSB AM Receiver. | Experiment | Duty to report |

| | | | | | |
|---|---|---|---|---|---|
| 10 | 2 | Frequency Modulation (FM) Circuits. | Frequency Modulation (FM) Circuits. | Experiment | Duty to report |
| 11 | 2 | FM Demodulation Circuits. | FM Demodulation Circuits. | Experiment | Duty to report |
| 12 | 2 | Pulse Amplitude Modulation & Demodulation (PAM). | Pulse Amplitude Modulation & Demodulation (PAM). | Experiment | Duty to report |
| 13 | 2 | Pulse Position Modulation & Demodulation (PPM). | Pulse Position Modulation & Demodulation (PPM). | Experiment | Duty to report |
| 14 | 2 | Pulse Width Modulation & Demodulation (PWM). | Pulse Width Modulation & Demodulation (PWM). | Experiment | Duty to report |
| 15 | 2 | Delta Modulation & Demodulation (DM). | Delta Modulation & Demodulation (DM). | Experiment | Duty to report |
| 16 | 2 | Digital Time Division Multiplexing & DE multiplexing (TDM). | Digital Time Division Multiplexing & DE multiplexing (TDM). | Experiment | Duty to report |
| 17 | 2 | Pulse Code Modulation & Demodulation (PCM). | Pulse Code Modulation & Demodulation (PCM). | Experiment | Duty to report |
| 18 | 2 | Differential Pulse Code Modulation & Demodulation (DPCM). | Differential Pulse Code Modulation & Demodulation (DPCM). | Experiment | Duty to report |
| 19 | 2 | Amplitude Shift Keying Modulation & Demodulation (ASK). | Amplitude Shift Keying Modulation & Demodulation (ASK). | Experiment | Duty to report |
| 20 | 2 | Frequency Shift Keying Modulation & Demodulation (FSK). | Frequency Shift Keying Modulation & Demodulation (FSK). | Experiment | Duty to report |
| 21 | 2 | Phase Shift Keying Modulation & Demodulation (PSK). | Phase Shift Keying Modulation & | Experiment | Duty to report |

| | | | | | |
|---|---|---|---|---|---|
| | | | **Demodulation (PSK).** | | |
| **22** | **2** | **Differential Phase Shift Keying Modulation & Demodulation (DPSK).** | **Differential Phase Shift Keying Modulation & Demodulation (DPSK).** | **Experiment** | **Duty to report** |

## 11.Course Evaluation

1- Daily pre- and post-tests?
2- Classroom activity and participation.
3- Semester exams.
4- Apply the group system in solving daily exercises.
5- Feedback method through self-correction of errors.

## 12.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (methodology, if any) | **None** |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# Computer Applications (2)

| | |
|---|---|
| 1. Course Name | |
| Computer Applications / Second Stage | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 1 Theoretical +3 Practical = 4* 30 weeks = 120 annual hours | |
| 7. Course administrator's name (if more than one name) | |
| Name: Liqa Tariq Hadi Email: lqaa.hadi@atu.edu.iq | |
| 8. Course Objectives | |
| **Course Objective** | **General Objective: For the purpose of teaching some of the vocabulary of the digital culture curriculum for computers and the Internet ICDL, which is adopted in all developed countries, as it includes computer basics, Microsoft Office applications, and applications**<br>**Internet (networks – Internet – e-mail)**<br>**Cognitive goals**<br>**1- The student can write Excel, Access and PowerPoint applications and how to manage and modify them.**<br>**2- The student creates different realistic practical applications with the help of Microsoft programs.**<br>**3- The student links between different computer programs and Microsoft applications for various fields of knowledge.**<br>**Course skills objectives.**<br>**1 - The student can manage the program windows for Excel, Access and PowerPoint applications and how to deal with them.**<br>**2 – The student learns to control applications through regular interfaces and through the application development environment**<br>**Embedded in Microsoft Office applications.**<br>**3 – The student links between the different applications of Microsoft Office and practical applications in various**<br>**Areas that use database systems.**<br>**Emotional and value goals**<br>**1- Qualifies the student to be a mentor and teacher in the subject referred to in this description.**<br>**2- Enabling the student to be a productive element in the field of information technology in the field of database applications and electronic spreadsheet systems.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | **1- View lectures by Data Show.**<br>**2- Use smart blackboards.**<br>**3- Discussions and seminars that students are assigned to prepare.**<br>**4- Reports for various topics that students are assigned to prepare./ Preparation applied projects by learners** |

## 10. Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| **1-9** | **4** | -Microsoft Excel<br><br>**- Hierarchical Excel environment, running Excel program, bars and tools, books and worksheets, tool box controls , opening a new document.**<br><br>**- Forms and controls: Create forms, add the following controls: text box - combo box - list box - command button - radio button - select button - use controls to enter and manipulate information (data), save worksheet, add and delete cells.**<br><br>**- Dealing with the application of Excel formulas: using and making formulas, mathematical effects, sequence of operations, comparison effects, reference effects, methods of writing the formula and beautifying and formatting the worksheet.**<br><br>**-Charts: Dealing with Charts Object**<br><br>**- How to import data from databases: Work with databases and Access application.**<br><br>**- Create a project that covers all the vocabulary of the study plan for Excel** | -Microsoft Excel<br><br>**-Forms and contro**<br><br>**-Forms and controls**<br><br>**-Dealing with the application of Excel formulas**<br><br>**-Charts**<br><br>**-How to import data from databases**<br><br>**- Create a project that covers all the vocabulary of the study plan for Excel**<br><br>**- Typical test on the computer machine for Microsoft Excel and questions for review.** | **Theoretical lectures + practical exercises** | **Practical evaluations** |

| | | | | | |
|---|---|---|---|---|---|
| | | **- Typical test on the computer machine for Microsoft Excel and questions for review.** | | | |
| **10-15** | **4** | Microsoft Power Point | Microsoft Power Point | **Theoretical lectures + practical exercises** | **Practical evaluations** |
| **16-22** | **4** | Microsoft Access | Microsoft Access | **Theoretical lectures + practical exercises** | **Practical evaluations** |
| **23-26** | **4** | Computer Networks | Computer Networks | **Theoretical lectures + practical exercises** | **Practical evaluations** |
| **27-30** | **4** | Internet & E-mail | Internet & E-mail | **Theoretical lectures + practical exercises** | **Practical evaluations** |

## 11. Course Evaluation

1- Pre- and post-exams for each subject.
2- Evaluation of the student's activities for various topics periodically.
3- Evaluate students for the projects they are assigned to.
4- Final exams for a set of study modules and periodically.

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (methodology, if any | **None** |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# Computer Architecture

| | |
|---|---|
| 1. Course Name | |
| Architectural / Second Phase | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 Theoretical + 2 Practical = 4 * 30 weeks = 120 annual hours | |
| 7. Course administrator's name (if more than one name) | |
| Name: Rowaida Fadel | Email: ins.rod@atu.edu.iq |
| 8. Course Objectives | |
| **Course Objectives** | **<u>General Objective</u>: Introducing the student to the components of the microcomputer and microprocessors and how to program and use them.**<br>**Cognitive goals**<br>**1- Identify the components of the computer and their importance through structural charts.**<br>**2- See a detailed explanation of the components of the computer with practical examples.**<br>**3- The processor studies 8085 through complete detailed diagrams.**<br>**4- Understands how the computer represents and implements the programming sentence inside the computer.**<br>**Course skills objectives.**<br>**1 – Develops the skill of the concept of computer components.**<br>**2 – Trains on data transfer instructions and addressing instructions.**<br>**3- Compare the set of instructions and the difference between data transfer instructions and arithmetic and logical instructions and addressing instructions.**<br>**Emotional and value goals**<br>**1- Aware of the importance of learning computer work technology in order to keep pace with the development in the digital world and the impact of So on his own development.**<br>**2- He is convinced of the importance of this in line with the level of his love for his country.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | - **Teaching the student to write the steps of the instructions for transferring the contents of a record to the stack, for example, or moving the contents of the memory site that the stack points to the lower-ranking register, and then a practical example is taken of this.**<br>- **The student is trained on the processes of adhaling, output and interruptions in the computer with practical examples of this.** |

| 10. Course Structure - Theoretical | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required Learning Outcomes** | **Unit / Subject Name** | **Method of education** | **Evaluation method** |
| **1** | **2** | **A quick review of numerical systems and their importance for microcomputers - transfers between systems.** | **A quick review of numerical systems and their importance for microcomputers - transfers between systems.** | **Theoretical lectures** | **editorial** |
| **2** | **2** | **Definition of microcomputers - definitions of microComputer terms: bit - byte - instruction - program - software - high-level languages - low-level languages - assembly language - machine language.** | **Definition of microcomputers - definitions of microComputer terms** | **Theoretical lectures** | **editorial** |
| **3** | **2** | **MicroComputer architecture - MicroComputer mass chart - Nawafel system (data carrier - address carrier - control carrier).** | **MicroComputer architecture - MicroComputer mass chart - Nawafel system (data carrier - address carrier - control carrier).** | **Theoretical lectures** | **editorial** |
| **4** | **2** | **Memory - Main memory - ROM-only memory - ROM-comparison - auxiliary memory and the difference between them and main memory.** | **Memory - Main memory - ROM-only memory - ROM-comparison - auxiliary memory and the difference between them and main memory.** | **Theoretical lectures** | **editorial** |
| **5** | **2** | **CPU - Microprocessor - Definition - Block diagram showing the microprocessor architecture - Microprocessor 8085. Terminal diagram and block diagram - data bus bumpers - address bus bumpers and a comparison between them.** | **CPU - Microprocessor - Definition - Block diagram showing the microprocessor architecture - Microprocessor 8085. Terminal diagram and block diagram - data bus bumpers - address bus bumpers and a comparison between them.** | **Theoretical lectures** | **editorial** |

| | | | | | |
|---|---|---|---|---|---|
| 6 | 2 | Registers, their types and use- Calculation and logic unit - Flag register - Microprocessor notification 8085 - Utility of the flag register. Program counter IP Stack indicator SP - Instruction log- Command coder - Controller. | Registers, their types and use- Calculation and logic unit - Flag register - Microprocessor notification 8085 - Utility of the flag register. Program counter IP Stack indicator SP - Instruction log- Command coder - Controller. | Theoretical lectures | editorial |
| 7 | 2 | Microprocessor Instructions 8085 – Characteristics of Directives. What is meant by addressing and its types in the 8085 processor. And the types of Operand (triple - binary - mono - zero) | Microprocessor Instructions 8085 – Characteristics of Directives. What is meant by addressing and its types in the 8085 processor. And the types of Operand (triple - binary - mono - zero) | Theoretical lectures | editorial |
| 8 | 2 | Data Transfer Group Instructions (Part I) - Solving Examples - Writing an Application Program. | Data Transfer Group Instructions (Part I) - Solving Examples - Writing an Application Program. | Theoretical lectures | editorial |
| 9 | 2 | Data Transfer Group Instructions (Part II) - Solving Examples - Writing an Application Program. | Data Transfer Group Instructions (Part II) - Solving Examples - Writing an Application Program. | Theoretical lectures | editorial |
| 10 | 2 | Input and output directives and their relationship to data transfer group inputs - practical examples. | Input and output directives and their relationship to data transfer group inputs - practical examples. | Theoretical lectures | editorial |
| 11 | 2 | A group of arithmetic instructions (addition instructions) - practical examples. | A group of arithmetic instructions (addition instructions) - practical examples. | Theoretical lectures | editorial |
| 12 | 2 | A group of arithmetic instructions (subtraction instructions) - increase and decrease instructions - practical examples. | A group of arithmetic instructions (subtraction instructions) - increase and decrease instructions - practical examples. | Theoretical lectures | editorial |
| 13 | 2 | A set of logical instructions and their | A set of logical instructions and their | Theoretical | editorial |

| | | | | | |
|---|---|---|---|---|---|
| | | types - practical examples - and their use in the representation of logical equations. | types - practical examples - and their use in the representation of logical equations. | lectures | |
| 14 | 2 | Comparison guidelines - practical examples. | Comparison guidelines - practical examples. | Theoretical lectures | editorial |
| 15 | 2 | A set of branching instructions - conditional and unconditional - practical examples - the importance of this group in writing programs. | A set of branching instructions - conditional and unconditional - practical examples - the importance of this group in writing programs. | Theoretical lectures | editorial |
| 16 | 2 | Control Guidelines Group. | Control Guidelines Group. | Theoretical lectures | editorial |
| 17 | 2 | Programs to perform arithmetic operations (addition - subtraction) for more than one rank. | Programs to perform arithmetic operations (addition - subtraction) for more than one rank. | Theoretical lectures | editorial |
| 18 | 2 | Stages of execution of the instruction - the cycle of the instruction - the cycle of the machine - the timing scheme for the execution of one of the instructions (the instruction to store the contents of the accumulator in a memory location, for example) - how the microprocessor reads data in memory. | Stages of execution of the instruction - the cycle of the instruction - the cycle of the machine - the timing scheme for the execution of one of the instructions (the instruction to store the contents of the accumulator in a memory location, for example) - how the microprocessor reads data in memory. | Theoretical lectures | editorial |
| 19 | 2 | Formation of repetition loops - time delay loops - one episode - two episodes - three episodes - application programs for each of them. | Formation of repetition loops - time delay loops - one episode - two episodes - three episodes - application programs for each of them. | Theoretical lectures | editorial |

| | | | | | |
|---|---|---|---|---|---|
| 20 | 2 | Practical examples showing how to exploit time delay loops. | Practical examples showing how to exploit time delay loops. | Theoretical lectures | editorial |
| 21 | 2 | Writing a program for an ascending counter - with an example of an application. | Writing a program for an ascending counter - with an example of an application. | Theoretical lectures | editorial |
| 22 | 2 | Writing a program for a countdown counter - with an application example | Writing a program for a countdown counter - with an application example | Theoretical lectures | editorial |
| 23 | 2 | Applied examples on the microcomputer 8085. | Applied examples on the microcomputer 8085. | Theoretical lectures | editorial |
| 24 | 2 | An example of generating pulses with a required frequency and a known duty cycle compared to pulse generators using integrated circuits. | An example of generating pulses with a required frequency and a known duty cycle compared to pulse generators using integrated circuits. | Theoretical lectures | editorial |
| 25 | 2 | General idea over other types of processors. | General idea over other types of processors. | Theoretical lectures | editorial |
| 26 | 2 | Microprocessor 8086 - specifications - architecture. | Microprocessor 8086 - specifications - architecture. | Theoretical lectures | editorial |
| 27 | 2 | Microprocessor Structure Chart 8086. | Microprocessor Structure Chart 8086. | Theoretical lectures | editorial |
| 28 | 2 | Types of addressing for microprocessor 8086 - Data transfer instructions. | Types of addressing for microprocessor 8086 - Data transfer instructions. | Theoretical lectures | editorial |
| 29 | 2 | Microprocessors with 32 ranks and their most prominent specifications - microprocessors used in Pentium Computers. | Microprocessors with 32 ranks and their most prominent specifications - microprocessors used in Pentium Computers. | Theoretical lectures | editorial |
| 30 | 2 | General Review. | General Review. | Theoretical lectures | editorial |

| Course Structure - Practical | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required Learning Outcomes** | **Unit / Subject Name** | **Method of education** | **Evaluation method** |
| **1** | **2** | **General introduction to the subject of microcomputers - Familiarizing students with the laboratory microComputer - its most important parts - and how to use it - Guiding students on how to write down the practical results and prepare the weekly report.** | **General introduction to the subject of microcomputers** | **Theoretical lectures** | **editorial** |
| **2** | **2** | **Start with the microcomputer - use the key (SUBMEM) to enter data into memory and modify it.** | **Start with the microcomputer - use the key (SUBMEM) to enter data into memory and modify it.** | **Theoretical lectures** | **editorial** |
| **3** | **2** | **Use the CHKREG key to scan records and change their value.** | **Use the CHKREG key to scan records and change their value.** | **Theoretical lectures** | **editorial** |
| **4** | **2** | **Teach the student how to write a simple program in assembly language, translate it and prepare it for implementation on the Computer.** | **Teach the student how to write a simple program in assembly language, translate it and prepare it for implementation on the Computer.** | **Theoretical lectures** | **editorial** |
| **5** | **2** | **Use the SINGL-STEP key to execute programs step by step.** | **Use the SINGL-STEP key to execute programs step by step.** | **Theoretical lectures** | **editorial** |
| **6** | **2** | **Use the GO key to fully execute the program.** | **Use the GO key to fully execute the program.** | **Theoretical lectures** | **editorial** |
| **7** | **2** | **Write a program in assembly language and convert it to machine language with execution.** | **Write a program in assembly language and convert it to machine language with execution.** | **Theoretical lectures** | **editorial** |

| | | | | | |
|---|---|---|---|---|---|
| 8 | 2 | Transportation and loading instructions (Part I). | Transportation and loading instructions (Part I). | Theoretical lectures | editorial |
| 9 | 2 | Transportation and loading instructions (Part II). | Transportation and loading instructions (Part II). | Theoretical lectures | editorial |
| 10 | 2 | Input and output instructions. | Input and output instructions. | Theoretical lectures | editorial |
| 11 | 2 | Flag records. | Flag records. | Theoretical lectures | editorial |
| 12 | 2 | Addition and multiplication injunctions. | Addition and multiplication injunctions. | Theoretical lectures | editorial |
| 13 | 2 | Subtraction and subtraction instructions with metaphor. | Subtraction and subtraction instructions with metaphor. | Theoretical lectures | editorial |
| 14 | 2 | Increases and decreases indices. | Increases and decreases indices. | Theoretical lectures | editorial |
| 15 | 2 | Logical Instructions (Part I). | Logical Instructions (Part I). | Theoretical lectures | editorial |
| 16 | 2 | Logical Instructions (Part Two). | Logical Instructions (Part Two). | Theoretical lectures | editorial |
| 17 | 2 | Represent logical equations using programming. | Represent logical equations using programming. | Theoretical lectures | editorial |
| 18 | 2 | Comparison indices. | Comparison indices. | Theoretical lectures | editorial |
| 19 | 2 | Conditional and unconditional jumping instructions. | Conditional and unconditional jumping instructions. | Theoretical lectures | editorial |
| 20 | 2 | Control instructions. | Control instructions. | Theoretical | editorial |

| | | | | | |
|---|---|---|---|---|---|
| | | | | lectures | |
| 21 | 2 | Make time delay loops. | Make time delay loops. | Theoretical lectures | editorial |
| 22 | 2 | Program for binary ascending counter. | Program for binary ascending counter. | Theoretical lectures | editorial |
| 23 | 2 | Program for binary descending counter . | Program for binary descending counter . | Theoretical lectures | editorial |
| 24 | 2 | Program for binary ascending/descending counter. | Program for binary ascending/descending counter. | Theoretical lectures | editorial |
| 25 | 2 | Simple software for a photobulletin. | Simple software for a photobulletin. | Theoretical lectures | editorial |
| 26 | 2 | Simple program for a traffic signal for an intersection. | Simple program for a traffic signal for an intersection. | Theoretical lectures | editorial |
| 27 | 2 | Simple program to control the engine. | Simple program to control the engine. | Theoretical lectures | editorial |
| 28 | 2 | The 8086 microprocessor scans and changes the contents of memory locations, logs and log flags. | The 8086 microprocessor scans and changes the contents of memory locations, logs and log flags. | Theoretical lectures | editorial |
| 29 | 2 | Data transfer in the 8086 microprocessor. | Data transfer in the 8086 microprocessor. | Theoretical lectures | editorial |
| 30 | 2 | General Review. | General Review. | Theoretical lectures | editorial |

| 11. Course Evaluation | |
|---|---|
| Daily tests, classroom activity and participation, semester exams | |
| 12. Learning and Teaching Resources | |
| Required textbooks (methodology, if any) | **None** |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# Computer and DATA Security

| | |
|---|---|
| 1. Course Name | |
| Computer and Data Security / Phase II | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| 9/7/2024 | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2 theoretical +2 practical = 4 * 30 weeks = 120 annual hours | |
| 7. Course administrator's name (if more than one name) | |
| Name: Beida Hadi Mohamed | Email: ins.byd44@atu.edu.iq |
| 8. Course Objectives | |
| **Course Objectives** | **General Objectives**<br>**1- Introducing the student to modern security systems of different types, importance and tasks he performs.**<br>**2- Introducing the student to the components of computer security systems and accessories.**<br>**3- Teaching the student the principles of using security application programs.**<br>**4- Introducing the student to how to use programming languages in order to protect information.**<br>**Cognitive goals**<br>**1- The student should know the modern security operating systems of different types, importance and tasks that he performs.**<br>**2- The student should know the security components of the computer and its accessories.**<br>**3- The student should know the security programs and applications.**<br>**4 – The student should know the methods and steps of the software necessary to write protection codes.**<br>**Course skills objectives.**<br>**1 – Safe use of the computer.**<br>**2- Learn traditional encryption methods.**<br>**Emotional and value goals**<br>**1- The student should know the modern security operating systems of different types, importance and tasks that he performs.**<br>**2- Instilling confidence in the same student to use computer security programs and applications.**<br>**3- Making the student communicate with the safe outside world.**<br>**4- The student should realize the importance of information and computer security in various fields.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | **Theoretical lectures + practical application** |

| 10. Course Structure | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required Learning Outcomes** | **Unit / Subject Name** | **Method of education** | **Evaluation method** |
| **1,2,3** | **4** | Introduction to computer security. -<br>- How do we protect our most valuable assets?<br>- Where security problems occurred in computer system?<br>- Security goals. Kinds of security breaches.- | Introduction to computer security. -<br>- How do we protect our most valuable assets?<br>- Where security problems occurred in computer system?<br>- Security goals. Kinds of security breaches.- | **Theoretical + practical lectures** | **editorial** |
| **4,5,6** | **4** | The points of security vulnerabilities:<br>a) Hardware vulnerabilities (Attacks on HW).<br>b) Software vulnerabilities (Attacks on SW)- SW detection , theft, (Trojans horse, Virus, Information leak in a program).<br>c) Data vulnerabilities (Attacks on Data).<br>d) Other exposed assets (Network, Access, Key people).<br>Computer criminals:<br>a) Amateurs<br>b) Crackers or malicious hackers<br>c) Career criminals | The points of security vulnerabilities<br><br>Computer criminals | **Theoretical + practical lectures** | **editorial** |
| **7,8,9,10** | **4** | Methods of Defense:<br>a) Data controls (cryptography).<br>b) Software controls.<br>c) hardware controls.<br>d) The firewall. | Methods of Defense | **Theoretical + practical lectures** | **editorial** |

| | | | | | |
|---|---|---|---|---|---|
| | | e) Physical controls.<br>f) Policies.<br><br>g) Overlapping controls. | | | |
| **11,12,13,14** | **4** | Cryptography concept.<br>Symmetric VS asymmetric cryptosystem.<br>Cryptanalysis concepts.<br>Cryptographic system | Cryptography concept.<br>Symmetric VS asymmetric cryptosystem.<br>Cryptanalysis concepts.<br>Cryptographic system | **Theoretical + practical lectures** | **editorial** |
| **15,16,17,18** | **4** | Substitution Cipher Methods:<br>a) Mono- alphabetic substitution cipher:<br>- Caesar Cipher.<br>- Rot13 Cipher.<br>- Cipher Atbash.<br>- Simple- Substitution Cipher.<br>b) Polyalphabetic substitution Cipher :<br>- Vigenere Cipher.<br>c) Polygram substitution Cipher:<br>- Play fair Cipher.<br>d) The one – time pad.<br>Transposition Cipher Methods<br>a) Columnar Transposition Cipher.<br>b) Multi- layer columnar transposition Cipher<br>c) Double transposition Cipher.<br>Super Encryption Cipher. | Substitution Cipher Methods<br><br>Transposition Cipher Methods<br><br>Super Encryption Cipher | **Theoretical + practical lectures** | **editorial** |
| **19,20,21,22** | **4** | Stream Cipher Methods.<br>Block Cipher Methods.<br>Comparing stream & block Cipher system.<br>Secret key Cipher system– block Cipher method: DES/ data encryption standard | Stream Cipher Methods.<br>Block Cipher Methods.<br>Comparing stream & block Cipher system.<br>Secret key Cipher system– block Cipher method: DES/ data encryption standard | **Theoretical + practical lectures** | **editorial** |

| | | | | | |
|---|---|---|---|---|---|
| **23,24,25,26** | **4** | Public key Cipher system:<br>a) Knapsack Technique.<br>b) Rivest- Shamir-Adelman (RSA) technique.<br>c) Digital signature technique. | Public key Cipher system | **Theoretical + practical lectures** | **editorial** |
| **27,28,29,30** | **4** | Computer Network Security.<br>Types of network.<br>Mode of communication.<br>User Authentication:<br>a) password, PIN.<br>b) Credit Card, key.<br>c) Biometric Traits (physical and/or Behavioral)<br>Access control.<br>Steganography (information Hiding) Techniques. | Computer Network Security.<br>Types of network.<br>Mode of communication.<br>User Authentication<br>Access control.<br>Steganography (information Hiding) Techniques. | **Theoretical + practical lectures** | **editorial** |

| 11. Course Evaluation | |
|---|---|
| Daily tests, classroom activity and participation, semester exams , discussion | |
| 12. Learning and Teaching Resources | |
| Required textbooks (methodology, if any | **None** |
| Main references (sources) | **-Security for computer networks 2'nd edition, D.W.Davies and W.L.Price**<br>**-Security Mechanisms for computer network, sead Muftic** |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# Project

| | |
|---|---|
| 1. Course Name | |
| Project/Phase II | |
| 2. Course Code | |
| | |
| 3. Semester / Year | |
| Academic Year 2024/2025 | |
| 4. The history of preparation of this description | |
| | |
| 5. Available Attendance Forms | |
| Daily mandatory attendance | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 2Practical = 2 * 30 weeks = 60 hours per year | |
| 7. Course administrator's name (if more than one name) | |
| Name: Email : | |
| 8. Course Objectives | |
| **Course Objectives** | **<u>General Objective :</u> Training the student to rely on himself and benefit from his scientific information.**<br>**<u>Special Objective :</u> The student will be able to:**<br>**1- He relies on himself to prove his practical skills.**<br>**2- Identifies salient objectives in the project.**<br>**3- He learns how to deal with his group of students in order to support teamwork .**<br>**4- Maps and designs for the project.**<br>**5- Follows up the progress of work on the project in terms of time.**<br>**6- He sees and watches the model simplified his work.**<br>**7- His book learns the final report of the project and in an organized manner on the research format.**<br>**Cognitive goals**<br>**1- Introducing the student to how to conduct the project and write the research.**<br>**2- Introduce the student to how to discuss the results of a specific problem that was calculated in the project.**<br>**3- Introducing the student to how to deal with state departments.**<br>**Course skills objectives.**<br>**1 – Acquire the skill of searching for a specific topic.**<br>**2 – Acquire the skill of producing integrated research.**<br>**3 – Acquire the skill of dealing with the data and the required and then the result.**<br>**Emotional and value goals**<br>**1- Theoretical lectures.**<br>**2- Discussion in the classroom.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | **Theoretical lectures** |

| 10. Course Structure | | | | | |
|---|---|---|---|---|---|
| **The week** | **Hours** | **Required Learning Outcomes** | **Unit / Subject Name** | **Method of education** | **Evaluation method** |
| **1,2,3** | **2** | **Distributing projects to students, meeting with the supervising professor, and starting to review the library to obtain resources for the project scheduled for students.** | **Distributing projects to students, meeting with the supervising professor, and starting to review the library to obtain resources for the project scheduled for students.** | **Directives of the project supervisor** | **Oral** |
| **4,5,6** | **2** | **Collect information about the project, start theoretical study and prepare the necessary designs for the implementation of the project.** | **Collect information about the project, start theoretical study and prepare the necessary designs for the implementation of the project.** | **Directives of the project supervisor** | **Oral** |
| **7,8,9,10** | **2** | **Initiating the implementation of the planned designs and conducting experiments** | **Initiating the implementation of the planned designs and conducting experiments** | **Directives of the project supervisor** | **Oral** |
| **11,12, 13,14** | **2** | **And tests to obtain practical results - testing and evaluation of the previous stage.** | **And tests to obtain practical results - testing and evaluation of the previous stage.** | **Directives of the project supervisor** | **Oral** |
| **15,16, 17,18** | **2** | **Transfer the laboratory-executed experiments to the boards to obtain the practical designed model and conduct the test on the final model and obtain** | **Transfer the laboratory-executed experiments to the boards to obtain the practical designed model and conduct the test on the final** | **Directives of the project supervisor** | **Oral** |

| | | | | | |
|---|---|---|---|---|---|
| | | **the final results of the discussion.** | **model and obtain the final results of the discussion.** | | |
| **19,20, 21,22** | **2** | **Discuss the practical results and their suitability with the realistic results and find the necessary explanations for the apparent cases.** | **Discuss the practical results and their suitability with the realistic results and find the necessary explanations for the apparent cases.** | **Directives of the project supervisor** | **Oral** |
| **23,24, 25,26** | **2** | **Arrange the written parts of the report for each of the stages preceding the writing of the final report on the project as follows:<br>Project Name:<br>Project Supervisor:<br>Students' Names:<br>The bottom line:<br>Chapter One: Introduction<br>Chapter Two: Theoretical Part<br>Chapter Three: Practical Part and Results<br>Chapter Four: Discussion of Results, Conclusions and Proposals.<br>Sources** | **Arrange the written parts of the report for each of the stages preceding the writing of the final report on the project as follows:<br>Project Name:<br>Project Supervisor:<br>Students' Names:<br>The bottom line:<br>Chapter One: Introduction<br>Chapter Two: Theoretical Part<br>Chapter Three: Practical Part and Results<br>Chapter Four: Discussion of Results, Conclusions and Proposals.<br>Sources** | **Directives of the project supervisor** | **Oral** |
| **27,28, 29,30** | **2** | **Submit the demonstration of the project with the final report for the final test and evaluation procedure.** | **Submit the demonstration of the project with the final report for the final test and evaluation procedure.** | **Directives of the project supervisor** | **Oral** |

| | |
|---|---|
| 11. Course Evaluation | |
| **Oral + Discussion** | |
| 12. Learning and Teaching Resources | |
| Required textbooks (methodology, if any | **None** |

| | |
|---|---|
| Main references (sources) | **All books and resources related to the subject of the project within the ICT specialization** |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |

# Internet & Information Technology

| |
|---|
| 1. Course Name |
| Internet and Information Technology / Phase II |
| 2. Course Code |
| |
| 3. Semester / Year |
| Academic Year 2024/2025 |
| 4. The history of preparation of this description |
| 9/7/2024 |
| 5. Available Attendance Forms |
| Daily mandatory attendance |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 1 Theoretical+2Practical = 3 * 30 weeks = 90 annual hours |
| 7. Course administrator's name (if more than one name) |
| Name: Farah Mahmoud Email: farah.qasim.isa2@atu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | **General Objective:** **Identify the concepts of information technology, dealing with the Internet and creating websites.**<br>**Cognitive goals**<br>**1- The student can write web pages in various Internet languages and how to manage those pages and modified.**<br>**2- The student creates different practical websites using several well-known techniques.**<br>**3- The student learns the best way to get information from the Internet or download information Various to the Internet**<br>**Course skills objectives.**<br>**1 – The student can manage and maintain websites.**<br>**2- The student learns to create different websites that serve many purposes.**<br>**3- The student learns effective techniques in obtaining and sharing information in various Domains over the World Wide Web.**<br>**Emotional and value goals**<br>**1- Qualifies the student to be a mentor and teacher in the subject referred to in this description.**<br>**2- Enabling the student to be a productive element in the field of creating and designing websites.**<br>**3- Enabling the student to be an effective element in the field of exchange and distribution of information.** |

| |
|---|
| 9. Teaching and Learning Strategies |

| | |
|---|---|
| **Strategy** | **1- View lectures by Data Show.**<br>**2- Use smart blackboards.**<br>**3- Discussions and seminars that students are assigned to prepare.**<br>**4- Reports for various topics that students are assigned to prepare.**<br>**5- Preparation of applied projects by learners** |

## 10.Course Structure

| The week | Hours | Required Learning Outcomes | Unit / Subject Name | Method of education | Evaluation method |
|---|---|---|---|---|---|
| 1-2 | 2 | Introduction:<br>- What is the Internet (International Network)?/ A brief history of the discovery and development of Internet networks.<br>- Network types such as (ARPA net, National Science Foundation, World Wide Web www).<br>- How to connect to the Internet:<br>- Available methods with comparison between them in terms of cost and performance.<br>- Modem: definition, types, installation, and connection.<br>- Internet service receiving and broadcasting system.<br>- Make an online connection (New Connection Wizard) and disconnect.<br>- Benefits of the Internet.<br>- Identify the most important terms for the study of Internet networks: www , Internet or Net, http://, browser, HTML (Hyper Text Markup Language), FTP (File Transfer Protocol), IP Address, Upload, Download, Hyper Link, URL (Universal Resource Locater), Router, TCP/ IP, Server, Hub Switch, DSL, . | What is the Internet<br><br>Types of networks<br><br>How to connect to the Internet<br><br>Benefits of the Internet<br><br>Learn about the most important terms for studying Internet networks | Theoretical lectures | Practical evaluations |
| 3&4 | 2 | - Internet Explorer:<br>- Run the browser.<br>- Program screen contents:<br>- Address bar.<br>- Menu bar.<br>- Basic button bar. | Internet Explorer | Theoretical lectures | Practical evaluations |

| | | | | | |
|---|---|---|---|---|---|
| | | - Address box.<br>- Hide and show toolbars.<br>- Internet Properties:<br>- How to set a site page to be the start page.<br>- Cancel temporary files of the Internet.<br>- Clean the history list.<br>- Cancel URLs from the address box. | Internet Properties Options | | |
| 5 | 2 | - Study some basic browsing skills:<br>- Add to the list of favorite sites and delete from them.<br>- How to transfer files from the Internet to the computer.<br>- How to copy from web pages to the word processor program (MS word). | Study some basic browsing skills<br><br>How to copy from web pages to word processor software (MS word) | Theoretical lectures | Practical evaluations |
| 6 & 7 & 8 | 2 | - Electronic Mail:<br>-Defined.<br>- Types of e-mail available.<br>- Examples of sites that provide e-mail service such as:<br>- www.yahoo.com.<br>- www.hotmail.com.<br>- www.maktoob.com.<br>- Location highlighting (www.yahoo.com) and study the following:<br>- The possibility of obtaining e-mail.<br>- How to create a private email and access the mail page (sign in).<br>- How to create (compose), send, and receive (see inbox inbox) messages.<br>- How to send and receive images, sounds and other files.<br>- Sign out.<br>-How to get e-mail in other available locations. | E-mail Address<br><br>Site Highlight (www.yahoo.com)<br><br>How to get e-mail at other available sites | Theoretical lectures | Practical evaluations |
| 9 & 10 & | 2 | - Live and direct dialogue with others (Chatting):<br>- Introduction.<br>- Types of chat service. | Live and direct dialogue with others (Chatting) | Theoretical lectures | Practical evaluations |

| | | | | | |
|---|---|---|---|---|---|
| 11 | | - Examples of chat service types such as MSN messenger, ADL Instant messenger, ICQ, Yahoo messenger, Skype, Just VoIP, ..... ).<br>- Highlight (Yahoo messenger) and study the following:<br>- Sign in.<br>- Add a contact.<br>- Start a written conversation with the contact.<br>- Start voice chat with contact.<br>- Camera display and video incident.<br>- Send a file from this device to the other device.<br>- Establishment of a conference.<br>- Exit the program (sign out).<br>- How to get live chat sites in other available sites. | Highlight (Yahoo messenger)<br><br>- How to get live chat sites in other available sites. | | |
| 12 & 13 | 2 | -Search through the Internet:<br>- How to search through the browser.<br>- Introduction to search engines and how to search through it.<br>- Types of search engines.<br>- How to use some parameters for ease and speed of search such as (coefficient " ", coefficient *, coefficient AND, coefficient OR, coefficient (-), and coefficient (+).<br>- Applied examples on search engines such as:<br>-www.google.com<br>-www.yahoo.com.<br>- www.ayna.com.<br>- www.altavista.com | Search through the Internet | Theoretical lectures | Practical evaluations |
| 14 & 15 | 2 | - An illustrative study and its application to the possibility of corresponding with service sites, universities, | - An explanatory study and its application to the possibility | Theoretical lectures | Practical evaluations |

| | | | | | |
|---|---|---|---|---|---|
| | | **scientific journals, free entertainment, and others.**<br>**- How to subscribe to free scientific sites and others.**<br>**- General review of all curriculum vocabulary.** | **of correspondence with service sites, universities and scientific and entertainment magazines free of charge.**<br>**- How to subscribe to free scientific sites.**<br>**- General Review** | | |
| 16 | **2** | Introduction to information technology | Introduction to information technology | **Theoretical lectures** | **Practical evaluations** |
| **17** | **2** | Computer hardware (CPU and it's components) | Computer hardware (CPU and it's components) | **Theoretical lectures** | **Practical evaluations** |
| **18** | **2** | -Fixed memory programs - Computer software settings. (setup)<br><br>-Self-motivation programs post- power on self test<br><br>-Basic Input and Output Program (BIOS ) | Fixed memory programs<br><br>Self-motivation programs<br><br>Basic Input and Output Program | **Theoretical lectures** | **Practical evaluations** |
| **19** | **2** | Operating system – definition. List the major PC operating system definition. The advance that made the Linx, Unix, windows operating system popular. | Operating system | **Theoretical lectures** | **Practical evaluations** |
| **20** | **2** | Programming language type. Representation of integers- real's- characters | Programming language type | **Theoretical lectures** | **Practical evaluations** |
| **21** | **2** | Data type – constant – variables.<br>Logical and arithmetic operations.<br>Managing organizational data and information. | Data type, Logical and arithmetic operations, Managing organizational data and information | **Theoretical lectures** | **Practical evaluations** |

| | | | | | |
|---|---|---|---|---|---|
| **22** | **2** | Data base –definition– data base management system (DBMS) enable user to do . Differentiate between flat- file database and relational database. Steps needed to great a database purpose of filters and forms examples of query languages. | Data base | **Theoretical lectures** | **Practical evaluations** |
| **23** | **2** | Telecommunications and networks introduction. Telecommunications system and process. Communication media and channels. | Telecommunications and networks introduction. Telecommunications system and process. Communication media and channels. | **Theoretical lectures** | **Practical evaluations** |
| **24** | **2** | Introduction to Networks. Local area networks, Wide area networks. Network communication software. | Introduction to Networks. | **Theoretical lectures** | **Practical evaluations** |
| **25** | **2** | Introduction to Internet. The protocol concept TCP/ IP. The operation of internet. | Introduction to Internet. | **Theoretical lectures** | **Practical evaluations** |
| **26** | **2** | The evolution of internet. | The evolution of internet. | **Theoretical lectures** | **Practical evaluations** |
| **27** | **2** | The definition of interants. | The definition of interants. | **Theoretical lectures** | **Practical evaluations** |
| **28** | **2** | The differences between internet and interants. | The differences between internet and interants. | **Theoretical lectures** | **Practical evaluations** |
| **29** | **2** | Data communication with standard telephone lines & modems. | Data communication with standard telephone lines & modems. | **Theoretical lectures** | **Practical evaluations** |
| **30** | **2** | Algorithms basic and programming language. | Algorithms basic and programming language. | **Theoretical lectures** | **Practical evaluations** |

| 11.Course Evaluation |
|---|
| 1- Pre- and post-exams for each subject.<br>2- Evaluation of the student's activities for various topics periodically.<br>3- Evaluate students for the projects they are assigned to.<br>4- Final exams for a set of study modules and periodically. |

| 12.Learning and Teaching Resources | |
|---|---|
| Required textbooks (methodology, if any) | **None** |
| Main references (sources) | **Uniform binding** |
| Recommended books and references (scientific journals, reports...) | **Books in the Central Library of the Institute** |
| Electronic References, Websites | **Different sources of the Internet** |