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


# Academic Program and Course Description Guide

**2024**

# Introduction:

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

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

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

# Concepts and terminology:

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

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

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

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

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

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

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

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

# Academic Program Description Form

University Name: Al-Furat Al-Awsat Technical University
Faculty/Institute: Technical Institute of Karbala
Scientific Department: Computer Systems Techniques Dept.
Academic or Professional Program Name: Diploma of Computer Systems
Final Certificate Name: Diploma of Computer Systems Techniques
Academic System: Yearly
Description Preparation Date:
File Completion Date

Signature:

Head of Department Name: Mohammed Thajeel

Date: 3/3/2025

Signature

Mohammed FadHiL Neamah

Scientific Associate Name:

Date: 3/3/2025

The file is checked by:

Department of Quality Assurance and University Performance
Director of the Quality Assurance and University PerformanceDepartment:

Date: 11-3-2025

Signature Ali Neamah Hasan

Fadhil M. Dakir

Approval of the Dean

13-3-2025

# Academic Program Description Form

University Name: Al-Furat Al-Awsat Technical University
Faculty/Institute: Technical Institute of Karbala
Scientific Department: Computer Systems Techniques Dept.
Academic or Professional Program Name: Diploma of Computer Systems
Final Certificate Name: Diploma of Computer Systems Techniques
Academic System: Semesterly
Description Preparation Date:
File Completion Date

Signature:

Head of Department Name: Mohammed Thajeel

Date:

Signature

Mohammeel FadHiL Neamaha

Scientific Associate Name:

Date: 3/3/2025

The file is checked by:

Department of Quality Assurance and University Performance
Director of the Quality Assurance and University PerformanceDepartment:

Date: 11-3-2025

Signature Ali Neamah Hasan

Approval of the Dean

Fadhil Mdaha

13-3-2025

## 1. Program Vision

Providing society and the labor market with efficient and distinguished personnel capable of keeping pace with rapid scientific and technological developments in the fields of computer technology and information technology

## 2. Program Mission

Developing and enhancing the scientific and technical knowledge and skills of students and consolidating the values and ethics of the profession and scientific integrity

## 3. Program Objectives

I. Preparing technical cadres characterized by high efficiency and professionalism.
II. Keeping pace with technological developments in the fields of computers and smart devices and providing them to students with modern methods.
III. Strengthening the student's confidence in the importance of his specialty and his pioneering role in building a promising future for the nation and future generations.
IV. Openness to society and state institutions to find effective technical solutions to some of the problems facing the country and its institutions.
V. Preparing and holding courses, seminars and training programs according to the need of the labor market and state institutions for the purpose of improving institutional performance.
VI. Conducting original scientific research that addresses national problems.

## 4. Program Accreditation

The department has not yet been granted programmatic accreditation

## 5. Other external influences

Nothing

## 6. Program Structure

| Program Structure | Number of Courses | Credit hours | Percentage | Reviews* |
|---|---|---|---|---|
| **Institution Requirements** | 4 | 8 | 3% | |
| **College Requirements** | | | | |
| **Department Requirements** | 14 | 116 | 90% | |
| **Summer Training** | 1 | 4 | 7% | |
| **Other** | -- | -- | -- | |

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

## 7. Program Description

| Year/Level | Course Code | Course Name | Credit Hours (theoretival/practical) | |
|---|---|---|---|---|
| **1st year** | | Programming in C++ language | 2 | 3 |
| **1st year** | | Algorithms and problem solving | 1 | 2 |
| **1st year** | | Computer architecture | 2 | 3 |
| **1st year** | | Computer Maintenance | 2 | 3 |
| **1st year** | | Ready-made applications | 2 | 3 |
| **1st year** | | Mathematics and numerical analysis | 2 | 2 |
| **1st year** | | Advanced statistics | 1 | 2 |
| **1st year** | | Human rights and democracy | 1 | |
| **1st year** | | English language | 1 | |
| **2nd year** | | Data structures | 2 | 3 |
| **2nd year** | | Databases | 2 | 3 |
| **2nd year** | | Operating systems | 2 | 2 |
| **2nd year** | | Systems analysis | 1 | 2 |
| **2nd year** | | Programming V.Basic | 2 | 3 |
| **2nd year** | | computer networks | 1 | 2 |
| **2nd year** | | website design | 1 | 2 |
| **2nd year** | | English language | 1 | |
| **2nd year** | | The crimes of the Baath regime in Iraq | 1 | |
| **2nd year** | | The project | 0 | 2 |

## 8. Expected learning outcomes of the program

| | |
|---|---|
| **Knowledge** | |
| Ability to apply knowledge at work to enter and analyze computer data | Possessing extensive knowledge |
| **Skills** | |
| – The ability to design a system, component, or process to meet sustainable constraints.<br>– Ability to work within multidisciplinary teams to analyze and solve problems | Possessing extensive knowledge |
| **Ethics** | |
| Ability to communicate effectively in different ways. | Possessing extensive knowledge |
| The broad education necessary to understand the impact of computer solutions on society and the surrounding environment | Possessing extensive knowledge |

## 9. Teaching and Learning Strategies

- -Brainstorming
- 2- Enhancing student participation and interaction

## 10. Evaluation methods

Daily and quarterly theoretical and practical tests.

## 11. Faculty

### Faculty Members

| Academic Rank | Specialization | | Special Requirements/Skills (if applicable) | | Number of the teaching staff | |
|---|---|---|---|---|---|---|
| | General | Special | | | Staff | Lecturer |
| Assistant Professor | | • | | | • | |
| Assistant Professor | | • | | | • | |
| Lecturer | • | | | | • | |
| Assistant Lecturer | | • | | | • | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Assistant Lecturer | | • | | | • | |
| Assistant Lecturer | | • | | | • | |
| Assistant Lecturer | | • | | | • | |
| Assistant Lecturer | • | | | | • | |

## Professional Development

### Mentoring new faculty members

Organizing periodic meetings for faculty members in order to enhance their academic knowledge, whether at the level of teaching or scientific research, methods of dealing with students, and classroom management.

### Professional development of faculty members

Workshops, seminars and training programs are held periodically in order to develop the skills and capabilities of faculty members

## 12. Acceptance Criterion

The applicant for admission to the Computer Systems Technology Department programs is required to have an Iraqi preparatory certificate, scientific stream, or its equivalent, and from the scientific stream only.
- Student admission is subject to the central admission line by the Ministry of Higher Education and Scientific Research.

## 13. The most important sources of information about the program

Following up on the latest developments in the corresponding scientific departments in reputable international universities in order to benefit from pioneering experiences and update curricula and methods of research, teaching and training.

## 14. Program Development Plan

- Recognize and nurture students with outstanding potential/achievements.
- Developing and improving summer training.
- Improving teaching and learning skills by placing teaching and technical personnel in advanced courses in international universities.
- Continuous development of the department's infrastructure.
- Encouraging teamwork among students.
- Opening the door for appointments in order to increase the number of department teachers in order to fill the acute shortage.
- Developing the department's laboratories by providing them with the latest computers and accessories, as well as devices and equipment for computer networks.

| Program Skills Outline | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Required program Learning outcomes | | | | | | | | | | | |
| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | Skills | | | | Ethics | | | |
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
| 1st year | | Programming in C++ language | Basic | | | | | | | | | | | | |
| | | Algorithms and problem solving | Basic | | | | | | | | | | | | |
| | | Computer architecture | Basic | | | | | | | | | | | | |
| | | Computer Maintenance | Basic | | | | | | | | | | | | |
| | | Ready-made applications | Basic | | | | | | | | | | | | |
| | | Mathematics and numerical analysis | Basic | | | | | | | | | | | | |
| | | Advanced statistics | Basic | | | | | | | | | | | | |
| | | Human rights and democracy | Basic | | | | | | | | | | | | |
| | | English language | Basic | | | | | | | | | | | | |
| | | Data structures | Basic | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Databases | Basic | | | | | | | | | | | | |
| | | Operating systems | Basic | | | | | | | | | | | | |
| | | Systems analysis | Basic | | | | | | | | | | | | |
| | | Programming V.Basic | Basic | | | | | | | | | | | | |
| | | computer networks | Basic | | | | | | | | | | | | |
| | | website design | Basic | | | | | | | | | | | | |
| | | English language | Basic | | | | | | | | | | | | |
| | | The crimes of the Baath regime in Iraq | Basic | | | | | | | | | | | | |
| | | The project | Basic | | | | | | | | | | | | |

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

# **Course Description** Programming in C++ language

| |
|---|
| 1. Course Name: |
| Programming in C++ language |
| 2. Course Code: |
| |
| 3. Semester / Year: |
| Yearly / First class |
| 4. Description Preparation Date: |
| 11/2/2024 |
| 5. Available Attendance Forms: |
| Mandatory (theoretical and practical lectures) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 150 hours/10 unite |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Mohammed Thajeel Abdullah<br>Email: inkr.moh4@atu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | • Learn about the concept of programs and programming languages, their types, features, and uses of each.<br>• Learn about the C++ programming language and what are the basic components of the structure of this language to build a program.<br>• Identify the basic libraries and how to include and use them in this language.<br>• Learn about the data types and how to create and use each of them.<br>• Learn how to deal with mathematical operations (equations) in this language.<br>• Learn about reading and printing instructions in this language.<br>• Learn about arrays and how to deal with them in this language.<br>• Identify functions and procedures.<br>• Learn about files and how to deal with them in this language.<br>• Learn about graphics instructions and how to use them in this language. |

| 9. Teaching and Learning Strategies | |
|---|---|
| **Strategy** | • Theoretical lecture.<br>• Lab lecture.<br>• Discussion with students and students among themselves.<br>• Class and home exercises.<br>• Preparing reports and projects related to the scientific material of lecture. |

10. Course Structure

| **Week** | **Hours** | **Required Learning Outcomes** | **Unit or subject name** | **Learning method** | **Evaluation method** |
|---|---|---|---|---|---|
| 1 | 5 | Cognitive | Abstract of programming languages | Lecture and discussion | Questions and answers |

| | | | | | |
|---|---|---|---|---|---|
| 2 | 5 | Cognitive and emotional | • What's a program language<br>• The date and development of programming languages<br>• Levels of programming languages<br>• C++ language: beginning, development, its location within Levels of programming languages<br><br>Basic essentials for C++ language/ C++ language concepts<br>• What's C++ program contains? | Lecture, discussion and exercises | Discuss and solve exercises |
| 3 | 5 | Cognitive and emotional | • What are the basic files? Simple explanation for basic files, that C++ program include<br><br>Basic element and tools of C++ language<br>• Language symbols | Lecture, discussion and exercises | Discuss and solve exercises |
| 4 | 5 | Cognitive and emotional | • Definitions name<br>• keywords<br>• Constant represents<br>• Variables represent<br><br>Data types in C++, and the represent methods in memory | Lecture, discussion and exercises | Discuss and solve exercises |
| 5 | 5 | Cognitive and emotional | • char type<br>• integer type<br>• real type<br>• Boolean (logical) type<br>• Converting between deferent data types<br><br>• Expressions types in C++ language, how formulate expression:<br>• Arithmetic expression/deferent arithmetic operation and its priorities/conversion | Lecture, discussion and exercises | Discuss and solve exercises |
| 6 | 5 | Cognitive and emotional | manner of arithmetic expression to Arithmetic expression in C++ language/deferent examples | Lecture, discussion and exercises | Discuss and solve exercises |

| | | | | | |
|---|---|---|---|---|---|
| 7 | 5 | Cognitive and emotional | • Relational expression/ relational operations and its priorities/ formulate Relational expression<br>• Logical expression/ logical operation and its priorities/ formulate Logical expression | Lecture, discussion and exercises | Discuss and solve exercises |
| 8 | 5 | Cognitive and emotional | • Compound expression/ priorities table of public operations/ deferent examples | | |
| 9 | 5 | Cognitive and emotional | • Give the primary values of constants and variables<br>• Spaces and brackets<br>• Type of comments<br>• Special tools | Lecture, discussion and exercises | Discuss and solve exercises |
| 10-11 | 10 | Cognitive and emotional | minim tools<br>• Assignment statement, its types/ with explanation examples<br>• Arithmetic expression (equation)<br>• counters, counter types | Lecture, discussion and exercises | Discuss and solve exercises |
| 12 | 5 | Cognitive and emotional | • deferent images for equations belong to C++ language<br>• Formatted Input and output functions | Lecture, discussion and exercises | Discuss and solve exercises |
| 13 | 5 | Cognitive and emotional | • output text<br>• Output numeric values<br>• Output Arithmetic expression<br>• un Formatted Input and output functions | Lecture, discussion and exercises | Discuss and solve exercises |
| 14 | 5 | Cognitive and emotional | Control, conditional, and loop statements<br>cond. Statement<br>• Cond. Tools<br>• If conditional | Lecture, discussion and exercises | Discuss and solve exercises |
| 15 | 5 | Cognitive and | statement<br>• If…else statement | | |

| | | | | | |
|---|---|---|---|---|---|
| | | emotional | • Nested conditional<br>• switch conditional statement | Lecture, discussion and exercises | Discuss and solve exercises |
| 16 | 5 | Cognitive and emotional | • nested switch statement | Lecture, discussion and exercises | Discuss and solve exercises |
| 17 | 5 | Cognitive and emotional | Repetition statements<br>• for loop, Nested for | Lecture, discussion and exercises | Discuss and solve exercises |
| 18 | 5 | Cognitive and emotional | • while statement | Lecture, discussion and exercises | Discuss and solve exercises |
| 19-20 | 10 | Cognitive and emotional | • do…while statement | Lecture, discussion and exercises | Discuss and solve exercises |
| 21 | 5 | Cognitive and emotional | control at repetition<br>continue statement | Lecture, discussion and exercises | Discuss and solve exercises |
| 22 | 5 | Cognitive and emotional | exit statement<br>go to statement<br>Dimensional variables: arrays and matrices<br>One Dimensional array | Lecture, discussion and exercises | Discuss and solve exercises |
| 23 | 5 | Cognitive and emotional | two Dimensional array, square array(as special state of two Dimensional array | Lecture, discussion and exercises | Discuss and solve exercises |
| 24 | 5 | Cognitive and emotional | Symbolic array, and represent string type | Lecture, discussion and exercises | Discuss and solve exercises |
| 25 | 5 | Cognitive and emotional | Functions<br>Global and local variable<br>Define function<br>Call function | Lecture, discussion and exercises | Discuss and solve exercises |
| 26-27 | 10 | Cognitive and emotional | Ways of calling functions<br>• Form of retrieving values from function | Lecture, discussion and exercises | Discuss and solve exercises |

| | | | | | |
|---|---|---|---|---|---|
| 28-30 | 15 | Cognitive and emotional | • parameters arguments<br>• factors effecting at using functions<br>• functions of type void<br>• User defined functions<br><br>Library of standards functions:<br>• String functions<br>• Arithmetic functions<br>• Date and time functions<br><br>Graphics and screen:<br>• Colors functions<br>• Draw pixels functions<br>• Draw lines functions<br>• Draw rectangle functions<br>• Draw Circle functions<br>• Draw pattern functions<br>• Types of screens<br><br>Build workable integral system, include arrays and above-mentioned functions | Lecture, discussion and exercises | Discuss and solve exercises |

## 11. Course Evaluation

- 5 Daily preparation
- 5 daily exams
- 20 First course exam
- 20 Second course exam
- 50 Final exam

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | None |
| Main references (sources) | None |
| Recommended books and references (scientific journals, reports...) | • C++ Programming Language |
| Electronic References, Websites | W3school.com |

# Mathematics and numerical analysis

| 1. Course Name: |
|---|
| Mathematics and numerical analysis |
| 2. Course Code: |
| |
| 3. Semester / Year: |
| First year |
| 4. Description Preparation Date: |
| 13/2/2024 |
| 5. Available Attendance Forms: |
| Direct |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 120 Hr. /240 U |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Dr. Alaa Kamil Fleah Alasadi<br>Email: inkr.ala@atu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | Teaching the Student mathematical methods used in solving mathematical questions in a logical and include identification of functions and its derivatives , differentiation, integration and differential equations and difference equations, finding root and differentiation and numerical methods in solving. Mathematics compared with mathematical methods, Using computer applications, including MATLAB. |

| 9. Teaching and Learning Strategies | |
|---|---|
| **Strategy** | Brainstorming |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1 | 4 | Developing logical and problem-solv ability | Types of matrices/arrays/matrices/proper | Lecture and discussion | Quick test and hom e wo |

| | | | | | |
|---|---|---|---|---|---|
| 3&2 | 4 | Cognitive | Operations on matrices | Lecture and discussion | Quick test and hor e wo |
| 4 | 4 | Developing logical and problem-solving ability | Inverted matrix/methods found | Lecture and discussion | Quick test and hor e wo |
| 5&6 | 4 | Emotional and cognitive | Solving linear equations using inverted matrix | Lecture and discussion | Quick test and hor e wo |
| 7&8 | 4 | Developing logical and problem-solv ability | Linear trigonometric functions, and their products | Lecture and discussion | Quick test and hor e wo |
| 9&10 | 4 | Emotional and cognitive | And the logarithmic and exponential functions and their products | Lecture and discussion | Quick test and hor e wo |
| 11 | 4 | cognitive | Partial differentiation/implicit differentia | Lecture and discussion | Quick test and hor e wo |
| 12 | 4 | Emotional and cognitive | numerical differentiation/trapezoid meth | Lecture and discussion | Quick test and hor e wo |
| 13 | 4 | Emotional | Ordinary differential equations of first or | Lecture and discussion | Quick test and hor e wo |
| 14 | 4 | Emotional and cognitive | Types and methods of solution of differential equations (separation of variables, homogeneous) | Lecture and discussion | Quick test and hor e wo |
| 15 | 4 | cognitive | Full differential equations and linear | Lecture and discussion | Quick test and hor e wo |
| 16 | 4 | cognitive | Unlimited integration/integration/integra exponential and the logarithmic and linear | Lecture and discussion | Quick test and hor e wo |
| 17 | 4 | Emotional a cognitive | Methods of integration (partial fractions/retail) | Lecture and discussion | Quick test and hor e wo |
| 18&19 | 4 | cognitive | Numerical integration/Simpson method | Lecture and discussion | Quick test and hor e wo |
| 20 | 4 | Emotional a cognitive | Find the polynomial Newton formula/forward/updating using polynomial | Lecture and discussion | Quick test and hor e wo |
| 21&22 | 4 | | Find the root of the equation/method return (repetition)/firm/a Newton method | Lecture and discussion | Lecture and discus sion |

| | | | | | |
|---|---|---|---|---|---|
| 23&24 | 4 | | The real root of the equation/a theoretical value of the real root/drawing method | Lecture and discussion | Lecture and discussion |
| 25&26 | 4 | | Method of error/way half-periods | Lecture and discussion | Lecture and discussion |
| 27&28 | 4 | | Iterative formulas especially/way Newton-Rufson | Lecture and discussion | Lecture and discussion |
| 28 | 4 | | Series of others terminated (convergent openings of volatile commodity) | Lecture and discussion | Lecture and discussion |
| 30 | 4 | | Series convergence test methods and others closed (Test ratio, root Test ) | Lecture and discussion | Lecture and discussion |

## 11. Course Evaluation

The first and the second-semester exams are evaluated of 20 points and 10 points for the work of the year including the daily exams, the attendance, and the assignments. For the final exam, the evaluation is of 50 points.

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricu books, if any) | |
| Main references (sources) | Thomas' Calculus |
| Recommended books and references (scientific journals, reports…) | |
| ElectronicReferences, Websit | https://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx<br>https://math24.net/derivatives-trigonometric-functions.html#example1<br>https://www.math10.com/en/algebra/matrices/systems-of-linear-equati ns.ht |

## Computer architecture

| |
|---|
| 1- Course Name: Computer architecture |
| |
| 2- Course Code: None |
| |
| 3-Semester / Year: Yearly / First |
| |
| 4-Description Preparation Date: 10/02/2024 |
| Introducing the student to the types of computers, numerical systems, and conversion between them, then addressing the representation of numbers in a digital calculator, Boolean algebra, the physical components of an electronic computer, machine languages, and data representation. |
| 5-Available Attendance Forms: In institute (Presence) |
| |
| 6-Number of Credit Hours (Total)/Number of Units (Total): 150 hours/10 units |
| |
| 7-Course administrator's name (mention all, if more than one name) |
| Name: Assist. Lecture Haider MohammedAli M.R. AlTomah<br>Email: haideraltomah@atu.edu.iq |
| 8-Course Objectives |

| | |
|---|---|
| **Course Objectives** | • Identify the student to the types of computers.<br>• Identify the student to numerical systems, and conversion between them.<br>• addressing the representation of numbers in a digital calculator.<br>• Teach the student Boolean algebra.<br>• Learn the student physical components of an electronic computer, machine languages, and data representation. |

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

| | |
|---|---|
| **Strategy** | • Theoretical lecture.<br>• Practical lecture.<br>• Discussion with students and students among themselves.<br>• Preparing reports and projects related to the scientific material of the lecture. |

10- Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1st | 5 | Cognitive | Essential of information technical. Introduction, computer and software system, computer types. | Lecture and discussion | Questions and answers |
| 2nd | 5 | Cognitive and emotional | Numeric methods, include:<br>Decimal method.<br>Binary method.<br>Convert decimal to binary.<br>Four arithmetic operations in this method.<br>Interest this method in computer. | Lecture and discussion | Questions and exercises |
| 3rd | 5 | Cognitive and emotional | Octal method.<br>Convert from octal to decimal.<br>Convert from decimal to octal.<br>Convert from binary to octal.<br>Hexadecimal method.<br>Convert from binary to hexadecimal. | Lecture and discussion | Questions and exercises |
| 4th | 5 | Cognitive and emotional | Numeric representation in computer:<br>BCD codes, 4bit BCD codes<br>Check level.<br>Integer numeric representation, real numeric representation. | Lecture and discussion | Questions and answers |
| 5th | 5 | Cognitive | Gates:<br>Or gate, and gate, nor gate, nand gate, xor gate, xand gat, external edge diagram for integrated circuit of gates | Lecture and discussion | Questions and answers |
| 6th | 5 | Cognitive and emotional | Boolean algebra<br>Boolean algebra and de morgan theory.<br>Used Boolean algebra rules for simplified logical expression. | Lecture and discussion | Questions and exercises |
| 7th | 5 | Emotional | Formula rules and karnuf map.<br>Formula rules:<br>Summation of multiply limits, multiply of sum limit<br>Karnuf map for simplified functions:<br>Of two variable, of three variable. | Lecture and discussion | Questions and exercises |
| 8th | 5 | Cognitive and emotional | Digital circuit: arithmetic circuit.<br>Add circuit/ half adder – complete adder | Lecture and discussion | Questions and exercises |

| | | | | | |
|---|---|---|---|---|---|
| 9th | 5 | Cognitive and emotional | Subtract circuit/ half subtractive - complete subtracted.<br>Digital comparative. | Lecture and discussion | Questions and answers |
| 10th | 5 | Cognitive | Flip Flop<br>Type of S – R .<br>Type of J-K, type of D, type of T. | Lecture and discussion | Questions and exercises |
| 11th | 5 | Cognitive | Counting and shifting recorder.<br>Shifting recorder | Lecture and discussion | Questions and answers |
| 12th | 5 | Cognitive | Counter ascending asynchronous.<br>Counter descending asynchronous.<br>Stretcher of seven parts | Lecture and discussion | Questions and answers |
| 13th | 5 | Cognitive and emotional | Hardware, study hardware parts.<br>Characters and functions of box and power supply | Lecture and discussion | Questions and exercises |
| 14th | 5 | Cognitive and emotional | Study characters, functions and parts of motherboard. | Lecture and discussion | Questions and exercises |
| 15th | 5 | Cognitive | Study functions and types memory: ROM AND ROM | Lecture and discussion | Questions and answers |
| 16th | 5 | Emotional | Study bios setup, and update | Lecture and discussion | Questions and answers |
| 17th | 5 | Emotional | Study technical of secondary storage units :H.D , F.D , C.D ,DVD | Lecture and discussion | Questions and answers |
| 18th | 5 | Emotional | Study characters and functions of slots cards(net, sound, video) | Lecture and discussion | Questions and answers |
| 19th & 20th | 10 | Emotional | Microprocessor 8085, block diagram, components and function of processor | Lecture and discussion | Questions and answers |
| 21th & 22th | 10 | Emotional | Microprocessor 8086<br>Assembly language, statement form. | Lecture and discussion | Questions and answers |
| 23th & 24th | 10 | Emotional | Data Transfer & Arithmetic Instructions | Lecture and discussion | Questions and answers |
| 25th | 5 | Emotional | Logical & Branching Instructions | Lecture and discussion | Questions and answers |
| 26th | 5 | Emotional | Machine Control Instructions | Lecture and discussion | Questions and answers |
| 27th | 5 | Emotional | Immediate , Register , Direct ,indirect ADDRESSING | Lecture and discussion | Questions and answers |

| | | | | | |
|---|---|---|---|---|---|
| 28th | 5 | Emotional | Instruction cycle & Machine cycle | Lecture and discussion | Questions and answers |
| 29th | 5 | Emotional | Pentium processor, block diagram, processor component and function | Lecture and discussion | Questions and answers |
| 30th | 5 | Emotional | Processor Development comparative | Lecture and discussion | Questions and answers |

## 11- Course Evaluation

- First Course: 10 degrees for theoretical, 10 degrees for practical, 5 degrees for (daily exams, exercises, homeworks, and attendance).
- Second Course: 10 degrees for theoretical, 10 degrees for practical, 5 degrees for (daily exams, exercises, homeworks, and attendance).
- 50 degrees for final exam (40 theoretical and 10 practical).

## 12- Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | None |
| Main references (sources) | None |
| Recommended books and references (scientific journals, reports...) | • Basic Computer Architecture Version 2.2.<br>• Computer System architecture 3rd Edition. |
| Electronic References, Websites | **None** |

## English Language

| 1- Course Name: |
|---|
| English Language |
| 2- Course Code: |
| |
| 3- Semester / Year: |
| First year |
| 4- Description Preparation Date: |
| 13/2/2024 |
| 5- Available Attendance Forms: |
| Direct |
| 6- Number of Credit Hours (Total) / Number of Units (Total) |
| 30 Hr. /2 U |
| 7- Course administrator's name (mention all, if more than one name) |
| Name: Shahad Saleh Abdulmahdi<br>Email: shahad1986@atu.edu.iq |
| 8- Course Objectives |

| **Course Objectives** | • .....<br>• .....<br>• ..... |
|---|---|

| 9- Teaching and Learning Strategies | |
|---|---|
| **Strategy** | |

10- Course Structure

| **Week** | **Hours** | **Required Learning Outcomes** | **Unit or subject name** | **Learning method** | **Evaluation method** |
|---|---|---|---|---|---|
| 1& 2 | 2 | Cognitive | Hello | Lecture and discussion | Question and answers |

| | | | | | |
|---|---|---|---|---|---|
| 3&4 | 2 | Cognitive | Your world | Lecture and discussion | Question and answers |
| 5&6 | 2 | Emotiona l and cognitive | Personal information | Lecture and discussion | Question and answers |
| 7&8 | 2 | Emotiona l and cognitive | Family and frier | Lecture and discussion | Question and answers |
| 9&10 | 2 | Emotional and cogniti | It's my life | Lecture and discussion | Question and answers |
| 11&12 | 2 | Emotiona l and cognitive | Every day | Lecture and discussion | Question and answers |
| 13&14 | 2 | cognitive | Review | Lecture and discussion | Question and answers |
| 15&16 | 2 | Emotiona l and cognitive | Places I like | Lecture and discussion | Question and answers |
| 17&18 | 2 | Emotional | where I live | Lecture and discussion | Question and answers |
| 19&20 | 2 | Emotiona l and cognitive | Happy birthday | Lecture and discussion | Question and answers |
| 21&22 | 2 | cognitive | We had a good time | Lecture and discussion | Question and answers |
| 23&24 | 2 | cognitive | We can do it | Lecture and discussion | Question and answers |
| 25&26 | 2 | Emotional and cogniti | Thank you very much | Lecture and discussion | Question and answers |
| 27&28 | 2 | cognitive | Here and now | Lecture and discussion | Question and answers |
| 29&30 | 2 | Emotional and cogniti | It's time to go | Lecture and discussion | Question and answers |

## 11- Course Evaluation

The first and the second-semester exams are evaluated of 20 points and 10 points for the work of the year i

| 12- Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricu books, if any) | New headway beginner student book.<br>New headway beginner work book. |
| Main references (sources) | New headway beginner student book.<br>New headway beginner work book. |
| Recommended books and references (scientific journals, reports…) | |
| Electronic Referenc Websites | https://www.google.com/search?q=speak+now+3+student+bc ok+p<br>MgkIBBBFGDsYwgMyCQgFEEUYOxjCAzIJCAYQRRg7GMIDMgkI BxBI |

# Course Description OF Data Structures

| 1. Course Name: Data Structures | |
|---|---|
| | |
| 2. Course Code: None | |
| | |
| 3. Semester / Year: Yearly / Second | |
| | |
| 4. Description Preparation Date: 10/02/2024 | |
| | |
| 5. Available Attendance Forms: Mandatory (theoretical and practical lectures) | |
| | |
| 6. Number of Credit Hours (Total)/Number of Units (Total): 150 hours/10 units | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Assist. Prof. Dr. Wathiq Laftah Abd-Ali Al-Yaseen<br>Email: wathiq@atu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | • Identify the data structure and the basic concepts of the data structure.<br>• Identify the types of data structures and how choose<br>the appropriate data structure.<br>• Identify arrays, their types, and methods to deal wi them.<br>• Learn the pointers, how used, and write program w Pointers (allocated from memory and deleted).<br>• Learn about linked lists and their types.<br>• Learn about sorting and search algorithms.<br>• Identify files, their types, methods of composing the saving data in them, and retrieving them. |
| 9. Teaching and Learning Strategies | |

| | |
|---|---|
| **Strategy** | • Theoretical lecture.<br>• Practical lecture.<br>• Discussion with students and students among themselves.<br>• Preparing reports and projects related to the scientific material of the lecture. |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1st | 5 | Cognitive | - Definition of data structure<br>- Basic principles of data structures.<br>- Types of data structures.<br>- How choose the suitable data structure. | Lecture and discussion | Questions and answers |
| 2nd & 3rd | 10 | Cognitive and emotional | Simple data structures<br>- Integer numbers<br>- Float numbers<br>- Characteristics<br>- Strings<br>- Pointers<br>- Logical data | Lecture and discussion | Questions and exercises |
| 4th & 5th | 10 | Cognitive and emotional | Compound data structures<br>- Arrays<br>- Represent one dimension array in memory<br>- Represent two dimensions array in memory<br>- Row major order<br>- Column major order | Lecture and discussion | Questions and exercises |
| 6th | 5 | Cognitive and emotional | Pointers<br>- Pointer definitions | Lecture and discussion | Questions and answers |

| | | | | | |
|---|---|---|---|---|---|
| | | | - Memory/ allocate memory to pointer and editing<br>- Pointers advantages and characteristic<br>- Pointers and array/ arrays of pointers and pointer to array | | |
| 7th | 5 | Cognitive | - Pointer as address<br>- Pointer comparison<br>- Pointers of pointers<br>- Function pointers | Lecture and discussion | Questions and answers |
| 8th & 9th | 10 | Cognitive and emotional | Linked list<br>- Linked list definitions<br>- Linked list types and represent ways.<br>- Simple list/ reading items, print list, insert item in (front, determine locations, back) of list | Lecture and discussion | Questions and exercises |
| 10th & 11th | 10 | Emotional | - Binary list/reading items- print list<br>- Circle list/ reading items- print list | Lecture and discussion | Questions and exercises |
| 12th & 13th | 10 | Cognitive and emotional | Stack<br>- Array representation of stack<br>- linked stack<br>- Stack operations algorithms, Stack application | Lecture and discussion | Questions and exercises |
| 14th & 15th | 10 | Cognitive and emotional | Queue<br>- Represent queue using matrix<br>- linked queue<br>- queue applications<br>- circle queue | Lecture and discussion | Questions and answers |

| | | | | | |
|---|---|---|---|---|---|
| 16th & 17th | 10 | Cognitive | Non-linear data structures<br>- graphs.<br>- graphs types<br>- graphs representation | Lecture and discussion | Questions and exercises |
| 18th | 5 | Cognitive | Trees<br>- trees types<br>- trees representation.<br>- trees traversing methods | Lecture and discussion | Questions and answers |
| 19th | 5 | Cognitive | - Convert general tree to binary<br>- trees applications | Lecture and discussion | Questions and answers |
| 20th – 23th | 20 | Cognitive and emotional | Sorting algorithms<br>- selection sort<br>- bubble sort<br>- quick sort | Lecture and discussion | Questions and exercises |
| 24th & 25th | 10 | Cognitive and emotional | Searching algorithms<br>- sequential search<br>- binary search | Lecture and discussion | Questions and exercises |
| 26th | 5 | Cognitive | File Structures | Lecture and discussion | Questions and answers |
| 27th – 30th | 20 | Emotional | Case study for discussions | Lecture and discussion | Questions and answers |

## 11. Course Evaluation

- First Course: 10 degrees for theoretical, 10 degrees for practical, 5 degrees for (daily exams, exercises, homeworks, and attendance).
- Second Course: 10 degrees for theoretical, 10 degrees for practical, 5 degrees for (daily exams, exercises, homeworks, and attendance).
- 50 degrees for final exam (40 theoretical and 10 practical).

## 12. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | None |
| Main references (sources) | • C++ for Beginners …. Masters.<br>• Fundamentals of Programming C++.<br>• A Tour of C++ Second Edition. |

| | |
|---|---|
| | • C++ Primer, Fourth Edition. |
| Recommended books and references (scientific journals, reports...) | • C/C++ Users Journal (ACM Digital Library)<br>• Foundations of C++ (Springer) |
| Electronic References, Websites | https://learn.saylor.org/course/<br>https://cplusplus.com/<br>https://www.learncpp.com/ |

# Course Description of Data Base

| | |
|---|---|
| 13. Course Name: Data Base | |
| | |
| 14. Course Code: None | |
| | |
| 15. Semester / Year: Yearly / Second | |
| | |
| 16. Description Preparation Date: 10/02/2024 | |
| | |
| 17. Available Attendance Forms: Mandatory (theoretical and practical lectures) | |
| | |
| 18. Number of Credit Hours (Total)/Number of Units (Total): 150 hours/10 units | |
| | |
| 19. Course administrator's name (mention all, if more than one name) | |
| Name: Manal Hashem soad<br>Email: manal.soad@atu.edu.iq | |
| 20. Course Objectives | |
| **Course Objectives** | • Identify the data base and the basic concepts of the da base.<br>• Database Definition, characteristics, Compare databa with traditional file system.<br>• Identify keys and relationships.<br>• Identify Data types, Create tables and Append Blank<br>• Normal form Un normalized form First Normal fo 1NF,<br>second Normal form 2NFand third Normal form 3NF<br>• Data Models Relational Model.<br>• Create database and relationships using VFP<br>• Create views ,forms and reports.<br>• Identify programming VFP and Memory Variable |
| 21. Teaching and Learning Strategies | |

| | |
|---|---|
| **Strategy** | • Theoretical lecture.<br>• Practical lecture.<br>• Discussion with students and students among themselves.<br>• Preparing reports and projects related to the scientific material of the lecture. |

22. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| 1st | 5 | Cognitive | - Database Definition, characteristics<br>- Compare database with traditional file system. | Lecture and discussion | Questions and answers |
| 2nd & 3rd | 10 | Cognitive and emotional | - Keys:<br>Primary key<br>Secondary Key<br>- Relationships:<br>one to one<br>one to many<br>many to many | Lecture and discussion | Questions and exercises |
| 4th & 5th | 10 | Cognitive and emotional | - Data types<br>- Create tables<br>- Append Blank | Lecture and discussion | Questions and exercises |
| 6th – 8th | 15 | Cognitive and emotional | - Brows, Edit, Change data Browse partial data Blocking replace.<br>- Permanent deletion: Delete and Recall<br>- Un permanent deletion: Pack and zip | Lecture and discussion | Questions and answers |
| 9th | 5 | Cognitive | - Sorting and Indexing data<br>- Search and filter records: Seek, set filter, Locate, Go to | Lecture and discussion | Questions and answers |
| 10th | 5 | Cognitive and emotional | - collocation statement: Average, Sum, Count statistic and economic statement | Lecture and discussion | Questions and exercises |

| | | | | | |
|---|---|---|---|---|---|
| | | | - Calculate AVG(),CNT(),Sum(),Min() , STD() | | |
| 11th – 13th | 15 | Emotional | - Normal form Un normalized form<br>- First Normal form 1NF<br>- Second Normal form 2NF<br>- Third Normal form 3NF | Lecture and discussion | Questions and exercises |
| 14th | 5 | Cognitive and emotional | - Data Models<br>- Relational Model<br>- Advantages and disadvantages of relationships | Lecture and discussion | Questions and exercises |
| 15th | 5 | Cognitive and emotional | - Create database using VB queue<br>- Create relations in DBC | Lecture and discussion | Questions and answers |
| 16th & 17th | 10 | Cognitive | - Virtual tables views<br>- Create views | Lecture and discussion | Questions and exercises |
| 18th– 20th | 15 | Cognitive | Forms<br>Building forms with form<br>form Properties<br>data<br>layout<br>main forms sub form | Lecture and discussion | Questions and answers |
| 21th– 24th | 20 | Cognitive | - Create Reports<br>- Create Simple Reports Group Reports<br>- Compound report from several files using Relations or Views. Printing report | Lecture and discussion | Questions and answers |
| 25th | 5 | Cognitive and emotional | - .programming VFP<br>- Memory Variable Arrays If.....ENDIF<br>- Do case | Lecture and discussion | Questions and exercises |

| | | | | | |
|---|---|---|---|---|---|
| 26th | 5 | Cognitive and emotional | repetition statements:<br>Do … while statement<br>Scan…. end scan<br>For…End for | Lecture and discussion | Questions and exercises |
| 27th & 28th | 10 | Cognitive | Procedure and function<br>Private and public variable | Lecture and discussion | Questions and answers |
| 29th & 30th | 10 | Emotional | Create project and made application file also EXE file | Lecture and discussion | Questions and answers |

## 23. Course Evaluation

- First Course: 10 degrees for theoretical, 10 degrees for practical, 5 degrees for (daily exams, exercises, homeworks, and attendance).
- Second Course: 10 degrees for theoretical, 10 degrees for practical, 5 degrees for (daily exams, exercises, homeworks, and attendance).
- 50 degrees for final exam (40 theoretical and 10 practical).

## 24. Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | None |
| Main references (sources) | • Database System Concepts, 5th by Ed©Silberschatz, Korth and Sudarshan |
| Recommended books and references (scientific journals, reports...) | • تعلم لغــة البرمجة Microsoft Visual FoxPro 9.0 إعداد:معاذ مباركي<br>• محمد Fox Pro 6 دروس قواعد البيانات فوكس برو 6 فتحي الهدهد |
| Electronic References, Websites | https://books-library.net/free-3320917-download<br>https://books-library.net/files/download-pdf-ebooks.org-ku-18991.pdf |