Academic Program Description Form

University Name: AL_Furat AL_Awsat Technical University

Faculty/Institute: Karbala Polytechnic college

Scientific Department: Computer System Techniques Dept.

Academic or Professional Program Name: Computer System Techniques

Final Certificate Name: Diploma

Academic System: Yearly

Description Preparation Date: 10/9/2025

File Completion Date: 18/09/2025

Signature:	Signature:
Head of Department Name:	Scientific Associate Name:
Prof.Dr.Wathiq Laftah Abd Ali	Assist.Prof.Dr. Mohammed Fadhil Neamha
Date: 25/09/2025	Date: 25/09/2025

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Name and Signature: Assist.Prof. Ali neamah hasan

Prof.Dr. Fadil M.Dahir

Approval of the Dean

Ministry of Higher Education and Scientific Resear
Scientific Supervision and Scientific Evaluation Appa
Directorate of Quality Assurance and Academic Accred
Accreditation Department

Academic Program and Course Description Guide

2025

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: Karbala Polytechnic college

Scientific Department: Computer Systems Techniques Dept.

Academic or Professional Program Name: Diploma in computer systems techniques

Final Certificate Name: Diploma

Academic System: Yearly

Description Preparation Date: 10/9/2025

File Completion Date: 27/10/2025

Signature:	**Signature:**
Head of Department Name:	**Scientific Associate Name:**
Prof.Dr Wathiq Laftah Abd_Ali	**Asst.Prof.Dr Mohammed Fadel Neamaha**
Date:	**Date:**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Name and Signature:Assest.prof Ali neamah hasan

Prof.Dr Fadil M.Dahir

Approval of the Dean

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**
1.Preparing technical cadres characterized by high efficiency and professionalism. 2. Keeping pace with technological developments in the fields of computers and smart devices and providing them to students with modern methods. 3. 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. 4. Openness to society and state institutions to find effective technical solutions to some of the problems facing the country and its institutions. 5. 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. 6. 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**	
			theoretical	**practical**
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 _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 *enhancing student participation and interation

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 of 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 or research teaching and training

14. Program Development Plan

1.Recognizeand nurture students with outstanding potential/achievements

2.Developing and improving summer training

3.Improving teaching and learning skills by placing teaching and technical personnel in advanced courses in international universities

4.Continuous development of the department's infrastructure

5.Encouraging teamwork among students

6.Opening the door for appointments inorder to increasethenumber of department teachers in order to fill the acute shortage

7.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

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

Course Description Form

1. :Course name
Systems Analysis
2. : Course code
Nothing
3. :Chapter/ Year
Second year
4. :Date of preparation of this description
19/8/2025
5. :Available attendance forms
Live attendance
6. Total number of study hours/Total number of units
hour per week (1 theoretical + 2 practical) 1 3
7. : Course instructor name
Name: Assistant Professor Dr. Alaa Kamil Fleah :Email inkr.ala@atu.edu
8. Course objectives
Introducing the student to the meaning of graphical structure, types of graphical structures, their importance , characteristics , and available applications, with a statement of the advantages of structured programming and its efficiency compared to traditional . programming A- Cognitive objectives .A1- Identify basic concepts in information systems analysis and design . A2- Identify the stages of development of computer information systems . A3- Identify the stages of analysis and design of computer-based information systems . A4- Identify the systems development life cycle . A5- Identifying computer information systems security . A6- Identify the analysis and design of information systems based on knowledge bases . A7- Learn about object-oriented analysis and design
9. Teaching and learning strategies
.Explaining the scientific material to students in detail - . Students' participation in analyzing computer systems -2 . Discussion and dialogue on vocabulary related to the topic -4 .Use brainstorming to draw students' attention to the teacher -5 Create a group on Telegram for direct communication with Students -6

In order to attract the student's attention, the curriculum was divided into units, and a -7 .detailed plan was developed for each unit to help the student study in an organized manner As for student evaluation, it is done in different ways , including: brainstorming questions, -8 . assignments, and daily and weekly tests	

. B – Course specific skill objectives Learn about the nature of the program's work –B1 Microsoft Visio . B2 – Use of the program Microsoft Visio. To create all kinds of graphic models :B3 – Preparing and producing the necessary reports for the above graphic models by Microsoft Visio .
Teaching and learning methods
1- .Theoretical lecture 2- .Practical lecture 3- .Discussion with students and among students 4- .Preparing reports and projects related to the scientific material of the lecture
Evaluation methods
1- .Daily exams 2- .Post exercises and questions 3- .Homework assignment
C- Emotional and value-based goals .A1 – Benefiting from scientific material to understand the course of events A2 – The ability to deal with problems facing systems in general and computer systems in .particular and ways to solve them . A3 – Choose the best solution from among the available solutions and options A4 – Developing students' abilities to analyze the content of practical scientific variables to identify thinking skills and problem- solving skills.
Teaching and learning methods
. lectures -1 . Identify and diagnose problems through explanation, exercises and classroom drills -2

Practical applications to enable students to understand how to benefit from the graphic -3 . structures used and understand their application
Evaluation methods
. Direct questions and daily exams -1 . Motivating students and encouraging them to participate actively -2 . Discussion in lectures -3 . activities -4 . Exams Quarterly and actual attendance -5
.D – General and transferable skills (other skills related to employability and personal development) .D1– Possessing local and international courses in the specialty to enhance skills D2 – Possessing applied research that helps in developing knowledge about graphic structures .and the possibility of developing them .D3 – Tendency towards cooperation and teamwork

1. Course structure					
Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	hours	week
Questions and Answers	Lecture and discussion	Systems theory • Principles of Systems Theory • General characteristics of systems • Subsystems • Data processing • Information - Importance of • Information - Forms of Information	Identify basic concepts in information systems analysis and design	3	First – Third
Questions and exercises	Lecture and discussion	Computer Information Systems Basic computer functions - • computer features - components of information systems	Identify the stages of development of computer information . systems	3	Fourth-Seventh

		Stages of development of computer information systems Objectives of computer information systems The most important computer .information systems Systems Analyst Information - Computer- Aided Software Engineering Tools			
Questions and exercises	Lecture and discussion	Stages of analysis and design of computer-based information systems **System analysis phase (preliminary study)** **Methods of collecting information** **Methods of verifying the accuracy of information** System analysis phase (Detailed study) **System Process Analysis** System data analysis Relationship diagram Process Description Data classification Data encoding Relationship analysis System Modeling System modeling stages (in (the analysis phase	Identify the stages of analysis and design of computer-based information . systems	3	Eighth-Fifteenth
Questions and Answers	Lecture and discussion	Systems Development Life Cycle Design phase General design phase Preparing the logical model for the new system	Identify thesystems development life cycle	3	sixteenth and seventeenth

		• Steps for designing the logical model for the new system • "How to "make changes • Process Redesign Method • Preparing the physical model of the new system • Steps for designing the physical model of the new system • Detailed design phase • Interface design • Interfaces • Types of user interfaces • Input and output design • Output design • Input design • Output and input characteristics • Report design • Types of reports • Benefits of reports • Characteristics of good reports • Possible errors in report design • Pattern design • Model design objectives • Good model specifications • Form design steps • Database design • Points to consider when designing a database • Database design tools • Software design • Characteristics of good software			

Questions and Answers	Lecture and discussion	• Implementation phase • Training phase • Training during the system analysis and design phases • Training during the pre-implementation phase • Training plan • Conversion phase (conversion strategy) • Conversion strategy • Direct conversion strategy • Direct transfer • Parallel switching strategy • parallel conversion • Gradual conversion strategy • Evaluation and maintenance phase • Evaluation phase • Maintenance phase • Documentation • Types of documentation • The importance of documentation • Authentication method	Identifying computer information systems security	3	**eighteenth and nineteenth**
Questions and exercises	Lecture and discussion	Computer Information Systems Security introduction Computer Information Systems Security System	Understanding computer information systems security	3	Twenty

		Characteristics of the security system of the computer information system Elements of the computer information system security system Individuals Data security Software security Device and accessory security Communications and Networks Security Types of breaches in the security system of computer information systems computer viruses Virus damage computer crimes Methods of combating the risk of hacking into computer information systems • The cost of designing a security system for a computer information system			
Questions and exercises	Lecture and discussion	• Analysis and design of knowledge-based information systems • knowledge-based systems • knowledge • The expert • Knowledge bases • Types of knowledge	Understanding object-oriented analysis and design	3	twenty-first twenty-second

		• knowledge representation • knowledge-based system • Components of the knowledge system • Basic components of expert systems • Knowledge base • reasoning machine • Knowledge Engineer • User interfaces • Interpretation of the evidence • Comparison between knowledge bases and databases • Components of a knowledge base system • Knowledge base systems • Analysis and design of knowledge base systems • Analysis phase • Design phase • Development and programming stage • Implementation and testing phase • Maintenance phase • Knowledge base systems applications • Artificial intelligence • Areas of application of artificial intelligence • Expert systems			

		• Expert systems applications			
Questions and exercises	Lecture and discussion	Object-oriented analysis and design • Key concepts of object-oriented analysis and design • Unified Modeling Language • Object modeling • Object structure • Object-oriented modeling stages • Identify the objects that make up the system • Determine the properties of each object. • Determine events • Define the operations of each object • Determine the characteristics of each process. • Determine the chronological order of operations ○ System implementation • Methods for modeling the objects that make up the system • Features of the Unified Modeling Language • Unified Modeling Language Layers • layer : User objects layer ○ layer : the model layer • Layer 3: Beyond the model layer ○ layer : the metaphysical layer • Beyond the model Modeling using the Unified Modeling Language • Modeling diagrams •	Understanding object-oriented analysis and design	3	Twenty-third – Twenty-sixth

		Use Case Diagram• Writing use cases• Difficulties in writing use cases ○ Item (category) diagrams• Components of item plans• Disadvantages of item plans• Interactive charts• Cooperation schemes• Sequence diagrams• State diagrams• Physical diagrams• Component diagrams• Equipment plans• modelsUML • waterfall model• Features of the waterfall model• Disadvantages of the waterfall model • The most important problems of the waterfall model • spiral model• Disadvantages of the spiral model • Incremental iterative model• Initiation stage• Detailing stage• Construction phase• Moving• Repetitions• Time limit• Benefits of time blocking• • Typical project timings			
Questions and Answers	Lecture and discussion	Projects and General guidelines and general ideas: Types of computer systems General directions and instructions before starting work	Understanding how to implement projects, general guidelines, and general ideas for different types of computerized systems.	3	twenty-seventh – thirtieth

		on the project. The most .important warnings • Basic project items			

2. infrastructure	
Fundamentals of Information Systems Analysis and Design / Marwa Al-Aryani	Required textbooks -1
Fundamentals of Information Systems Analysis and Design / Marwa Al-EryaniShelly, Gary B., Cashman, Thomas J., & Vermaat , Misty E. *Discovering Computers 2008,*	Main references (sources) -2
	A- Recommended books and references ((.scientific journals, reports, etc
http://www.bls.gov/oes/current/oes151121.htm	...B - Electronic references, websites

3. Curriculum Development Plan
.Providing academic support in organizing scientific visits to laboratories of state institutions .1 2. Providing an appropriate classroom environment that enables teachers to diversify teaching .strategies 3. .Providing information technology in the campus library 4. Hosting experts from outside the institute or from the work environment for which they are preparing to benefit from their expertise in developing the course according to the actual needs .of the labor market

13. Course Name: Data Base	
14. Course Code:	
CS201	
15. Semester / Year: Yearly / Second	
16. Description Preparation Date: 15/10/2025	
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: Adil Yaseen Taha Email: adil.taha.ikr@atu.edu.iq	
20. Course Objectives	
Course Objectives	• Identify the data base and the basic concepts of the d base. • Database Definition, characteristics, Compare databa with traditional file system. • Identify keys and relationships. • Identify Data types, Create tables and Append Blank • Normal form Un normalized form First Normal fo 1NF, second Normal form 2NFand third Normal form 3NF • Data Models Relational Model. • Create database and relationships using VFP • Create views ,forms and reports. • Identify programming VFP and Memory Variable

Course Description of Data Base

21. Teaching and Learning Strategies

Strategy	• Theoretical lecture. • Practical lecture. • Discussion with students and students among themselves. • Preparing reports and projects related to the scientific material of the lecture.

22. Course Structure

Week	Hour s	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	5	- Database Definition, characteristics - Compare database with traditional file system.	Introduction to Databases	Lecture and discussio n	Questions and answers
2nd & 3rd	10	- Keys: Primary key Secondary Key -Relationships: one to one one to many many to many	Database Keys & Relationships	Lecture and discussio n	Questions and exercises
4th & 5th	10	- Data types - Create tables Append Blank	Tables and Data Types	Lecture and discussio n	Questions and exercises
6th – 8th	15	- Brows, Edit, Change data Browse partial data Blocking replace. - Permanent deletion: Delete and Recall Un permanent deletion: Pack and zip	Data Manipulation in Databases	Lecture and discussio n	Questions and answers

9th	5	- Sorting and Indexing data Search and filter records: Seek, set filter, Locate, Go to	Sorting and Indexing Data	Lecture and discussio n	Questions and answers
10th	5	- collocation statement: Average, Sum, Count statistic and economic statement - Calculate AVG(),CNT(),Sum(),Min() , STD()	Collocation Statement	Lecture and discussio n	Questions and exercises

11th – 13th	15	- Normal form Un normalized form - First Normal form 1NF - Second Normal form 2NF Third Normal form 3NF	Database Normalization	Lecture and discussio n	Questions and exercises
14th	5	- Data Models - Relational Model Advantages and disadvantages of relationships	Database Models and Relational Databases	Lecture and discussio n	Questions and exercises
15th	5	- Create database using VB queue Create relations in DBC	Database Programming with Visual Basic	Lecture and discussio n	Questions and answers
16th & 17th	10	- Virtual tables views Create views	Database Views and Virtual Tables	Lecture and discussio n	Questions and exercises
18th_ 20th	15	Forms Building forms with form form Properties datal ayout main forms sub form	Forms Design and Data Entry	Lecture and discussio n	Questions and answers

21th_ 24th	20	- Create Reports - Create Simple Reports Group Reports - Compound report from several files using Relations or Views. Printing report	Report Generation and Printing	Lecture and discussio n	Questions and answers
25th	5	- .programming VFP - Memory Variable Arrays If ……ENDIF Do case	Programming VFP	Lecture and discussio n	Questions and exercises

26th	5	repetition statements: Do … while statement Scan…. end scan For…End for	Loops and Iteration in VFP	Lecture and discussio n	Questio and exerci es
27th & 28th	10	Procedure and function Private and public variable	Procedures, Functions, and Variable Scope	Lecture and discussio n	Questio and answ s
29th & 30th	10	Create project and made application file also EXE file	Project Development and EXE Deployment	Lecture and discussio n	Questio and answ s

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...)	
Electronic References, Websites	https://books-library.net/free-3320917-download https://books-library.net/files/download-pdf-ebooks.org-ku-18991.pdf

Course Description Form

1. Course Name: Networks
2. Course Code: None

3. Semester / Year: Yearly / Second
4. Description Preparation Date: 10/02/2024
Introducing the student to networks, their benefits, technologies, types, types of connections, types of connection media, various physical components, and approved network standards. The student also learns about the Internet and the security of computers and networks.
5. Available Attendance Forms: In institute (Presence)
6. Number of Credit Hours (Total)/Number of Units (Total):
90 hours/6 units
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Lecture Haider MohammedAli M.R. AlTomah Email: haideraltomah@atu.edu.iq

8. Course Objectives	
Course Objectives	• Identify the Networks and the basic concepts of the networks. • Identify the types of networks and how to choose the appropriate networks. • Identify the types of cables and methods to connect them. • Learn the networks protocols, how used, OSI model , TCP/IP, UDP. • Learn about the Layers of TCP/IP and how to works. • Learn about the networks security. • Identify and Trace the Packet Tracer program to desig The Networks.

9. Teaching and Learning Strategies	
Strategy	• Theoretical lecture. • Practical lecture. • Discussion with students and students among themselves. • Preparing reports and projects related to the scientific material of the lecture.

10. Course Structure

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

1st	3	Introduction to Networks	Computer Network introduction Hierarchal link idea: • Server: server type. • Client. • Peer to peer network • Client / Server Network	Lecture and discussion	Questions and answers
2nd	3	Network Components	Main component of networks • Hardware: computer, cards, media, peripheral devices • Software: operating system of network, transmission protocol, network management system	Lecture and discussion	Questions and exercises
3rd & 4th	6	Network Design	Simple idea about basic network design. • Many thing must take when design network • Bus network • Ring network • Star network • Token ring network • Token passing network	Lecture and discussion	Questions and exercises
5th	3	Network Connection Methods	Generic idea about network communicate: Depend on network link manner: • Single points network communicate • Multi points network communicate Depend on geographic land : • Local Area Network(LAN) : its devices • Metropolitan Area Network (MAN): its devices, technical standard characters • Wide Area Network (WAN)): its devices, technical standard characters • Wide area Development network: internet, intranet, extranet	Lecture and discussion	Questions and answers

6th	3	Network Card	Network Interface Card(NIC): • Types of Network Interface Cards • Simple idea about construct and setup NIC • Simple idea about install NIC	Lecture and discussion	Questions and answers
7th	3	Cables Used in Networks	Cables used in network • Type and characteristic of network cables • Twisted pair cable • Coaxial cables • Fiber optic cable	Lecture and discussion	Questions and exercises
8th & 9th	6	Communication Media in Networks	Simple idea about communicate media between network items: • Wire communicate media • Wireless communicate media	Lecture and discussion	Questions and exercises
10th & 11th	6	Network Scope	Frequency Bandwidth: interesting, Measurements, Limitation, Throughput, compute data transfer.	Lecture and discussion	Questions and exercises
12th & 13th	6	Devices Used in Networks	Generic essentials about network communication devices: • Modems • Network Interface Card (NIC) • Repeaters • Hubs • Switches • Bridges • Routers • Gateways	Lecture and discussion	Questions and answers
14th & 15th	6	Introduction to Network Protocols	Network Protocols essentials work: What a Protocols ? Protocols work, Protocols characteristics, protocol defects Protocols jobs in sender device also in receiver device	Lecture and discussion	Questions and exercises
16th	3	Protocol Characteristics	Binding idea Explain TCP/IP protocol and important characteristics	Lecture and discussion	Questions and answers

17th & 18th & 19th	9	Network Systems and Layers	Basic Essentials back of OSI • Define the seven layers which OSI consist of • Define the three lower layers • Define the three upper layers • Define the three middle layers Protocol used to communicate between analogue layers Steps of Encapsulation, then De Encapsulation Define the service of OSI Simple idea about standard characteristics IEEE What is netting, ways to develop netting security.	Lecture and discussion	Questions and answers
20th & 21th & 22th	9	Types of Network Addresses	IP addressing and network mask. • IP addressing. • MAC hardware Address • Addresses recognition protocol ARP • Network division technique to sub network	Lecture and discussion	Questions and exercises
23th & 24th	6	Virtual Networks	Simple idea about virtual private network VPN: • Characteristics. • Component. • Protocols. • Theoretic component	Lecture and discussion	Questions and exercises
25th & 26th & 27th	9	Introduction to Network Security	Network security essentials: • Risks threats network and weakly points. • Protections Ways and tools • Solve network generic problems Computer and network security composition: • Humanity. • Hardware. • Software. • Database Network weakly points essentials, hackers type, safety ways Recent Spy way at network and computer center.	Lecture and discussion	Questions and answers

			Idea about computer and network crim. Idea about legality legislations		
28th & 29th & 30th	9	Introduction to Cryptography	Decoding: essentials, types, and ways. • Changeable Decoding way • Compensational decoding way	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)	• Cisco Networks academy Program.
Recommended books and references (scientific journals, reports...)	• Cisco Networks academy Tutorial
Electronic References, Websites	https://www.cisco.com/c/en/us/training-events.html https://www.netacad.com/ar/courses/cybersecurity https://www.tutorialspoint.com/

Course Description Form

13. Course Name
Data Structures
14. Course Code
None
15. Semester / Year
Yearly / Second
16. Description Preparation Date
10/06/2025
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: Dr. Mohammed Thajeel Abdullah
Email: inkr.moh4@atu.edu.iq

20. Course Objectives

Course Objective	• Identify the data structure and the basic concepts of the data structure. • Identify the types of data structures and how choose the appropriate data structure. • Identify arrays, their types, and methods to deal with them. • Learn the pointers, how used, and write program with Pointers (allocated from memory and deleted). • Learn about linked lists and their types. • Learn about sorting and search algorithms. • Identify files, their types, methods of composing the saving data i them, and retrieving them.

21. Teaching and Learning Strategies

Strategy	• Theoretical lecture. • Practical lecture. • Discussion with students and students among themselves. • Preparing reports and projects related to the scientific material c the lecture.

22. Course Structure

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

		- Memory/ allocate memory to pointer and editing - Pointers advantages and characteristic - Pointers and array/ arrays of pointers and pointer to array			
7th	5	- Pointer as address - Pointer comparison - Pointers of pointers - Function pointers	Concepts of pointers	Lecture and discussion	Questions and answers
8th & 9th	10	Linked list - Linked list definitions - Linked list types and represent ways. - Simple list/ reading items, print list, insert item in (front, determine locations, back) of list	Concepts of Linked list	Lecture and discussion	Questions and exercises
10th & 11th	10	- Binary list/reading items-print list - Circle list/ reading items-print list	Concepts of Linked list	Lecture and discussion	Questions and exercises
12th & 13th	10	Stack - Array representation of stack - linked stack - Stack operations algorithms, Stack application	Concepts of Stack	Lecture and discussion	Questions and exercises
14th & 15th	10	Queue - Represent queue using matrix - linked queue - queue applications - circle queue	Concepts of Queue	Lecture and discussion	Questions and answers
16th & 17th	10	Non-linear data structures - graphs. - graphs types - graphs representation	Concepts of Non-linear data structures	Lecture and discussion	Questions and exercises
18th	5	Trees - trees types - trees representation. - trees traversing methods	Concepts of Trees	Lecture and discussion	Questions and answers
19th	5	- Convert general tree to binary - trees applications	Concepts of Trees	Lecture and discussion	Questions and answers
20th – 23th	20	Sorting algorithms - selection sort - bubble sort - quick sort	Concepts of Sorting algorithms	Lecture and discussion	Questions and exercises
24th & 25th	10	Searching algorithms - sequential search - binary search	Concepts of Searching algorithms	Lecture and discussion	Questions and exercises
26th	5	File Structures	Concepts of File Structures	Lecture and discussion	Questions and answers
27th – 30th	20	Case study for discussions	Examples	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)	• C++ for Beginners …. Masters. • Fundamentals of Programming C++. • A Tour of C++ Second Edition. • C++ Primer, Fourth Edition.				
Recommended books and references (scientific journals, reports...)	• C/C++ Users Journal (ACM Digital Library) • Foundations of C++ (Springer)				
Electronic References, Websites	https://learn.saylor.org/course/ https://cplusplus.com/ https://www.learncpp.com/				

course Description Form

Course Objectives	
Strategy	

Week	Hours	Required Learning Outcomes	
1		Emotional and cognitive	
2	2	Emotional and cognitive	
3	2	Emotional and cognitive	
4	2	Emotional and cognitive	
5	2	Emotional and cognitive	
6	2	Emotional and cognitive	
7	2	Emotional and cognitive	
8	2	Emotional and cognitive	
9	2	Emotional and cognitive	
10	2	Emotional and cognitive	
11	2	Emotional and cognitive	
12	2	Emotional and cognitive	
13	2	Emotional and cognitive	
14	2	Emotional and cognitive	
11515	2	Emotional and cognitive	

Distributing the score out o

Required textbooks (curricula books, if any)	

Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websi	https://www.google.com/search?q=speak+now+3+stude nt+b DMgkIB BBF