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

Academic Program and Course
Computer Networks and Software Techniques Department

2025

Introduction:

The Department of Computer Systems Techniques was established in 1986-1987 and ranks first in the centralized admission distribution. It prepares and qualifies professionals with technical and technological expertise, enabling them to enter the job market and contribute efficiently to reconstruction and development. This is achieved through the use of the latest curricula, electronic devices, and the adoption of cutting-edge ideas in designing and building information systems.

The department focuses on both the theoretical and practical aspects of computer systems and their technologies. Its mission is to equip students with the skills and knowledge required to become professionals in the fields of information technology and computer systems.

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: To establish the department as a distinguished entity in the fields of computer science, information technology, communication networks, and the internet.

Program Mission: To create a technical education framework that relies on modern methods, ensuring high-quality outcomes in terms of quantity, quality, intellectual capability, and performance. The program aims to provide the essential elements for rapid adaptation to technological advancements and environmental changes, achieving an exceptional alignment with the needs of the market and society.

Program Objectives:

- ✓ Emphasizing technical knowledge:

  Provide students with a broad understanding of computer science and a specialized focus on computer systems technology, along with supplementary knowledge in areas such as mathematics.

- ✓ Focusing on design, implementation, and maintenance:

  Equip students with the fundamentals and methodologies for designing, implementing, and maintaining various computer systems and networks.

- ✓ Enhancing communication and leadership skills:

  Develop students' ability to communicate effectively in professional settings, foster leadership skills, and enable them to make well-informed and accurate decisions.

- ✓ Highlighting technical skills and professional ethics:

Emphasize the importance of technical proficiency, professional ethics, and workplace safety.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (annual) 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 extracurricular activities to achieve the learning outcomes of the Program.

Academic Program Description Form

University Name: Al-Furat Al-Awsat Technical University

Faculty/Institute: Najaf Technical Institute

Scientific Department: Computer Networks and Software Techniques Department

Academic or Professional Program Name: Technical Diploma

Final Certificate Name: Diploma in Computer Networks and Software Techniques

Academic System: Semester System

Description Preparation Date: /10/2024

File Completion Date: /11/2024

Signature:

Head of Department Name:

Assist.Prof. Dr. Salman Abed Kadhum

Date: **2025/6/29**

Signature:

Scientific Associate Name:

Lect. Dr. Salah Mahdi Saleh

Date: **2025/6/29**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Lect. Dr. Abdulwahb Abdulrazzaq

Date: ٢٥/٦/٢٩

Signature:

Approval of the Dean

1- program Vision
The department should occupy a distinguished position in the field of computers, information technology, communication networks and the Internet.

2- program message
Creating a technical education that adopts new methods of preparation and ensures high quality in the outputs quantity and quality achieved, and also in thought and performance in light of the availability of the components of rapid response to technical developments and changes in the surrounding environment in order to reach a distinctive alignment with the needs of the labor market and society.

3- Program objectives
Emphasis on technical knowledge through the knowledge provided to students in general computer science, particularly computer systems technologies, in addition to other support knowledge such as mathematics. Focusing on the methods and fundamentals of designing, implementing, and maintaining various computer systems and networks .Emphasizing communication skills with others in the workplace, developing leadership skills, and making sound, informed decisions. Emphasizing technical skills, professional ethics, and occupational safety.

4- Program accreditation
Accreditation Board for Engineering and Technology (ABET)

5- Other external influences
There is a close relationship with the labor market through communication with

official and semi-official departments, focusing on the software used by these departments, and curricula are updated accordingly.

6-Program structure				
Program structure	**Number of courses**	**Study unit**	**percentage**	**√Notes**
First Year	**9**	**66**	**40%**	
Second Year	**10**	**66**	**60%**	

7- Program Description				
Year / Level	**Course code**	**Course name**	**No. of credit hours**	
			Theoretical	**Practical**
First Year	**CNST100**	**C++ Programming – I**	**2**	**2**
	CNST101	**Computer basics**	**1**	**1**
	CNST102	**Computer Networking Basics**	**2**	**2**
	CNST103	**Logical Design**	**2**	**2**
	CNST104	**Mathematics and Numerical Analysis**	**2**	**2**
	CNST105	**Human rights and democracy**	**2**	**0**
	CNST106	**Arabic Language**	**2**	**0**
	CNST107	**C++ Programming –II**	**2**	**2**
	CNST108	**Python Language programming**	**2**	**2**
	CNST109	**Data communication**	**2**	**0**
	CNST110	**Website Design Basics**	**2**	**2**
	CNST111	**Wireless Networks**	**2**	**2**
	CNST112	**English Language**	**2**	**0**
	CNT113	**Baath regime crimes**	**2**	**0**

1- Expected learning outcomes of the program
Knowledge
Providing students with comprehensive, high-quality scientific knowledge in the field of computer systems. The ability to apply the scientific knowledge they have acquired in the field of computers to ensure cognitive communication among them and to benefit from contemporary developments. Preparing highly qualified personnel specialized in the field of computer systems to effectively contribute to establishing a knowledge society and achieving national development goals. This is achieved by creating an optimal academic environment for knowledge development and acquiring skills in research and innovation in the field of computers. Enhancing interaction with practical reality within government and private institutions by employing modern technologies, skills, technical tools, and technology.
Skills
The student will master the basic and advanced programming skills required to enrich their intellectual and technical knowledge in the field of computer science and its various applications. Master the skills required to manage informetion systems, databases, and website design with high efficiency. Master the preparation of scientific research in a manner that adheres to an integrated scientific methodology. Possess the professional skills required in the field of software and project developments, enabling them to confideantly develop higg-quality software solutions in various application areas under various realistic constraints.

1. Teaching and learning strategies

Lecture delivery method.

Laboratory instruction to acquire practical skells.

Student groups (yeam work).

E-learning includes:

• Video lectures or lectures in PFF format

• Online classes and online meetings to explain and discuss lectures

• Online assignments and homework for students

3- Evaluation methods

1. Oral tests to asses the student's academic backround.
2. Daily test.
3. Termly tests (written and practical).
4. Comprehensive (final) tests (written and practical).
5. .5Electronic tests, including: (theoretical tests, practical tests, reports, and projects).

4-Faculty

Faculty members

Academic rank	Specialization		Special requirements/skills (if any)	Faculty numbers	
	Major specialized	specialized field		Permanent Staff	Lecturer
Assistant Prof.	Computer Science	Computer Science		1	null
Lecturer	Computer Science	Computer Science		3	null

Assistant Lecturer	**Computer Science**	**Computer Science**		4	**null**

Professional development
Orientation of new faculty members
Striving to develop, refine, and master the skills necessary to advance to the top by utilizing the capabilities, qualifications, and information acquired during theoretical and practical study. This is achieved through: • Continuous learning by researching new developments ysing the library and intenet resources. • Attending specialized seminsrs and academic symposia. • Participating in academic conferences.
Professional development for faculty members
Faculty members must be within the established staffing levels and in accordance with the student-to-faculty ratio. Competency must be considered to cover all curricula. The institute must also have sufficient management capacity to accommodate student interaction and guidance, counseling, university and career services, developmant ectivities, and interaction with professional practitioners and employers.

1- Acceptance criteria
• Central admission for graduates of preparatory school/science stream. • The corresponding specialization in vocational preparatory schools. • Distinguished employees with a preparatory certificate. • Parallel admission

2- The most important sources of information about the program
• Scientific methodological books in the field of specialization. • Specialized practical books. • General and specialized computer programs.

1. Program development plan
• Providing academic support capabilities in organizing scientific visits to government institution laboratories. • Providing an appropriate classroom environment that enables instructors to diversify teaching strategies. • Providing information technology in the campus library. • Hosting experts from outside the institute or from the work environment for which they are preparing to benefit from their expertise in developing the curriculum according to the actual needs of the labor market.

Program Skills Map															
Required learning outcomes of the program															
Values				Skills				knowledge				Essential or elective?	Course Name	Course code	Year / Level
C4	C3	C2	C1	B4	B3	B2	B1	A4	A3	A2	A1				
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	C++ Programming – I	**CNST100**	**First Year / First Semester**
		√	√	√	√	√	√	√	√	√	√	**Essential**	Computer basics	**CNST101**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	Computer Networking Basics	**CNST102**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	Logical Design	**CNST103**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	Mathematics and Numerical Analysis	**CNST104**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	Human rights and democracy	**CNST105**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	Arabic Language	**CNST106**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	C++ Programming –II	**CNST107**	**First Year / Second Semester**
		√	√	√	√	√	√	√	√	√	√	**Essential**	Python Language programming	**CNST108**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	Data communication	**CNST109**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	Website Design Basics	**CNST110**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	Wireless Networks	**CNST111**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	English Language	**CNST112**	
√	√	√	√	√	√	√	√	√	√	√	√	**Essential**	Baath regime crimes	**CNT113**	

- Please tick the boxes corresponding to the individual learning outcomes of the program that are subject to assessment.

Course description form

Course Name
Data Structure
1. Course Code
CST200
2. Year / Semester
Yearly / Second
3. Preparation Date of this description
10/10/2022
4. Available attendance forms
Mandatory (theoretical and practical lectures)
5. Number of study hours (total)/number of units (total)
Number of theoretical hours (2) Number of practical hours (3) Total hours(5) Total number of units (10)
6. The name of the course leader (if more than one name is mentioned)
Name: Lec. Hanan Abas salman Email:
7. Course Objectives

Introduce the student to the meaning of the graphical structure and the types of graphical structures, their importance, characteristics and available applications, while explaining the advantages of structured programming and its efficiency compared to traditional programming.	Course Objectives

8. Teaching and Learning Strategies	
• Lecture Method • Teaching in laboratories to acquire practical skills • Team work • Assignments for students	**Strategies**
9. Course Structure	

Evaluation method	Learning method	Unit or topic name	Required learning outcomes	hours	Week
Questions & Answers	Lecture & Discussion	- definition of data structures - basic concept of data structures - data structure types - .data structures selecting	Cognitive	5	First
Questions & Exercises	Lecture & Discussion	- primitive data structures representation. - Integer. -Real - Characters . -String - Pointers . - Logical Data	Cognitive	5	Second - third
Questions & Exercises	Lecture & Discussion	Compound Data Structures. - Arrays. - Array Representation. - In-Memory Unary Array Representation. - Representing a binary array in memory. - Row Method. - Columns method.	Cognitive-affectional	5	Fourth -fifth
Questions & Exercises	Lecture & Discussion	Pointers - Pointer Definition - Memory / Reserving and freeing memory for pointers - Benefits and features of pointers Pointers and Arrays / Arrays of pointers and pointers to arrays	Cognitive-affectional	5	Sixth
Questions & Exercises	Lecture & Discussion	- Indicators as headings - Comparing Indicators - Indicator pointers - Function Indicators	Cognitive	5	Seventh
Questions & Exercises	Lecture & Discussion	Threaded Lists - Threaded List Definition - Types of threaded lists and how they are represented - Simple list / read items - print list - cram an item into (front, specific location, back) of the list	Cognitive	5	eighth - ninth
Questions & Exercises	Lecture & Discussion	1. Binary List / Read Items - Print List 2. Circular List / Read Items - Print List	Cognitive	5	Tenth – eleventh
Questions &	Lecture &	Stack.	Cognitive	5	Twelfth –

Exercises	Discussion	- Array representation of stack. - Linked stack. - Algorithms for stack operations. - Stack applications.			Thirteenth
Questions & Exercises	Lecture & Discussion	Queue. - Representation of a queue using an array. - Linked queue. - Queue applications. - Circular queue.	Cognitive	5	Fourteenth – Fifteenth
Questions & Exercises	Lecture & Discussion	.non-linear data structures -graphs. -graphs types -graphs representation.	Cognitive	5	Sixteenth – Seventh
Questions & Exercises	Lecture & Discussion	Trees. -trees types. -trees representation. -trees traversing methods.	Cognitive	5	Eighteenth
Questions & Exercises	Lecture & Discussion	Convert public trees to binary..-trees applications	Cognitive	5	Nineteenth
Questions & Exercises	Lecture & Discussion	sorting and searching. -sorting algorithms . .-selection sort bubble sort. -quick sort.	Cognitive	5	Twentieth – Twenty-third
Questions & Exercises	Lecture & Discussion	files structures	Cognitive	5	Twenty-sixth
Questions & Exercises	Lecture & Discussion	Case studies for discussion.	Cognitive-affectional	5	Twenty seventh – Thirteenth

10. Course evaluation

- Daily quizzes and exams.
- Consulting students and encouraging them to participate actively.
- Lecture discussion.
- Extra-curricular activities.
- Quarterly exams and attendance.

11. Learning and Teaching Resources

	Required textbooks (syllabus if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports ….)
	Electronic references, websites

Course description form

1. Course Name	
Data Bases	
1. Course Code	
CST201	
2. Year \ Semester	
Yearly \ Second	
3. Preparation Date of this description	
10\ 10\ 2022	
4. Available attendance forms	
Mandatory (theoretical and practical lectures)	
5. Number of study hours (total)/number of units (total)	
Number of theoretical hours (2) Number of practical hours (3) Total hours(5) Total number of units (10)	
6. The name of the course leader (if more than one name is mentioned)	
Name : falah Hasen Naama E-mail: fallahnajjar@atu.edu.iq	
7. Course Objectives	
Introduce the student to the most important theoretical and applied concepts of databases and their terminology. **Dealing with databases and programming them in SQL Server**	**Course Objectives**
8. Teaching and Learning Strategies	
• Lecture Method • Teaching in laboratories to acquire practical skills • Team work • Assignments for students	**Strategies**

9. Course Structure

Evaluation method	Learning method	Unit or topic name	Required learning outcomes	hours	week
Questions & Answers	Lecture & Discussion	Introduce the student to databases	Cognitive	5	First
Questions & Answers	Lecture & Discussion	Familiarize the student with the features of databases and compare them with traditional systems	Cognitive	5	Second
Questions & Exercises	Lecture & Discussion	(Data Model) Relational Model)	Cognitive-affectional	5	Third
Questions & Exercises	Lecture & Discussion	(Entity Relationship) (Hierarchical) (Network)	Cognitive-affectional	5	Fourth
Questions & Exercises	Lecture & Discussion	advantages and disadvantages of relationships	Cognitive	5	Fifth
Questions & Exercises	Lecture & Discussion	(Database Data Types) (Wizard + Code) (Wizard + Code)	Cognitive-affectional	5	Sixth
Questions & Exercises	Lecture & Discussion	(SQL Server) DDL, DML, DCL, TCL, DQL	Cognitive	5	Seventh
Questions & Exercises	Lecture & Discussion	- Data Definition Language (DDL) - Create, Alter	Cognitive-affectional	5	Eighth
Questions & Exercises	Lecture & Discussion	- Data Definition Language (DDL) Drop, Truncate	Cognitive-affectional	5	Ninth
Questions & Exercises	Lecture & Discussion	Data Query Language (DQL)	Cognitive	5	Tenth
Questions & Exercises	Lecture & Discussion	Data Display (Select) Display a subset of data	Cognitive-affectional	5	Eleventh
Questions & Exercises	Lecture & Discussion	Data Markup Language (DML)	Cognitive	5	Twelfth
Questions & Exercises	Lecture & Discussion	Insert Data	Cognitive-affectional	5	Thirteenth
Questions & Exercises	Lecture & Discussion	Update data Delete	Cognitive-affectional	5	Fourteenth
Questions & Exercises	Lecture & Discussion	Join between Tables	Cognitive-affectional	5	Fifteenth
Questions & Exercises	Lecture & Discussion	- Arrange data Group By + Sort	Cognitive-affectional	5	Sixteenth
Questions & Exercises	Lecture & Discussion	- Data indexing Group By	Cognitive-affectional	5	Seventeenth
Questions & Exercises	Lecture & Discussion	Search and Filter (Where Clause)	Cognitive-affectional	5	Eighteenth
Questions & Exercises	Lecture & Discussion	Aggregation functions (Aggregation)	Cognitive-affectional	5	Nineteenth

Questions & Exercises	Lecture & Discussion	Data Control Language (DCL) Revoke	Cognitive-affectional	5	Twentieth
Questions & Exercises	Lecture & Discussion	Data Control Language (DCL) Grant	Cognitive-affectional	5	Twenty-one
Questions & Exercises	Lecture & Discussion	Transaction Control Language (TCL)Commit, Rollback	Cognitive-affectional	5	Twenty-second
Questions & Exercises	Lecture & Discussion	Transaction Control Language (TCL) Save point	Cognitive-affectional	5	Twenty-third
Questions & Exercises	Lecture & Discussion	Virtual Tables (Views)	Cognitive-affectional	5	Twenty-four
Questions & Exercises	Lecture & Discussion	Virtual Table Configuration and Uses	Cognitive-affectional	5	Twenty-fifth
Questions & Exercises	Lecture & Discussion	Stored Procedures and their programming and ways to call them (procedures)	Cognitive	5	Twenty-sixth
Questions & Exercises	Lecture & Discussion	Stored Procedures (Select)	Cognitive-affectional	5	Twenty-seventh
Questions & Exercises	Lecture & Discussion	Stored Procedures (insert)	Cognitive-affectional	5	Twenty-eighth
Questions & Exercises	Lecture & Discussion	Stored Procedures (update)	Cognitive-affectional	5	Twenty-ninth
Questions & Exercises	Lecture & Discussion	Stored Procedures (delete)	Cognitive-affectional	5	Thirtieth

10- Course evaluation

- Daily quizzes and exams.
- Consulting students and encouraging them to participate actively.
- Lecture discussion.
- Extra-curricular activities.
- Quarterly exams and attendance.

11. Learning and Teaching Resources

	Required textbooks (syllabus if any)
Fundamentals of Database systems 6e	Main References (Sources)
SQL Notes For Professionals	Recommended supporting books and references (scientific journals, reports ….)
	Electronic references, websites

Course description form

1. Course Name	
Operating Systems	
2. Course Code	
CST202	
3. Year \ Semester	
Yearly \ Second	
4. Preparation Date of this description	
10\ 10\ 2022	
5. Available attendance forms	
Mandatory (theoretical and practical lectures)	
6. Number of study hours (total)/number of units (total)	
Number of theoretical hours (2) Number of practical hours (2) Total hours(4) Total number of units (8)	
7. The name of the course leader (if more than one name is mentioned)	
Name: Suhad AbdulZahra Hachim E-mail: suhadaalzhra201@atu.edu.iq	
8. Course Objectives	
Introduce the student to systems software in general, then address the types of systems and their general functions, identify the types and specifications of some operating systems, and give case studies on the use of these systems.	**Course Objectives**
9. Teaching and Learning Strategies	
• Lecture Method	**Strategies**

• Teaching in laboratories to acquire practical skills • Team work • Assignments for students	

10. Course Structure

Evaluation method	Learning method	Unit or topic name	Required learning outcomes	hours	week
Questions & Answers	Lecture & Discussion	An introduction that includes: - A brief history of computer operating systems - Operating System Definition - Types of operating systems - Mainframe operating systems - Server operating systems - Multiprocessor Operating Systems - Personal Computer Operating Systems - Laptop Operating Systems - Embedded Operating Systems - Real-time operating systems - Smart Card Operating Systems	Cognitive	4	First
Questions & Answers	Lecture & Discussion	Operating System Services	Cognitive	4	Second
Questions & Answers	Lecture & Discussion	Computer System Structure	Cognitive	4	Third
Questions & Answers	Lecture & Discussion	Basic terms and concepts in operating systems: - Programme, Process - Address space - Resources and sharing - Operating system kernels and shells - Proactive system preparations	Cognitive	4	Fourth
Questions & Answers	Lecture & Discussion	- Caching - Interrupts (interrupts), trap, exceptions - Vector and interrupt routines - Buses	Cognitive	4	Fifth
Questions & Exercises	Lecture & Discussion	Loading the operating system into the Computer memory and start it up - How to locate and load the operating system - Booting the computer	Cognitive	4	Sixth

		- Basic I/O Services - Adjusting computer Settings - Bootable and non-bootable discs - How computer Boot works			
Questions & Exercises	Lecture & Discussion	- Hard Disk Partitioning - Formatting the hard drive - How do I install a new computer operating system?	Cognitive	4	Seventh
Questions & Exercises	Lecture & Discussion	File systems: - Files - File Naming - File Structure - File Types - File access methods - File specifications - Operations that can be performed on files , directories and folders - Single-level and tiered directories - Directory path labelling - Operations that can be performed on directories	Cognitive	4	Eighth
Questions & Exercises	Lecture & Discussion	•File System Completion - FAT16-32 file system - NTFS file system - Comparison between FAT and NTFS file systems - How to convert between FAT and NTFS file systems	Cognitive	4	Ninth
Questions & Answers	Lecture & Discussion	Copying and Backup Files - Backup - Types of Backup - Standard - Differential - Incremental - Daily - Backup File Recovery	Cognitive	4	Tenth
Questions & Answers	Lecture & Discussion	Storage structure: - A simple introduction to : 1- Physical components of main memory 2- Types of electronic circuits used in building the main memory 3- Desired specifications in the main memory 4- Progressive structure of storage devices	Cognitive	4	Eleventh

Questions & Answers	Lecture & Discussion	Protecting physical components: - Input and output protection - Memory Protection - Memory protection - The difference between the terms protection and security in computer logic	Cognitive	4	Twelfth
Questions & Answers	Lecture & Discussion	Operating system Managements: - A simple introduction to: - Process Management (Processors) - Main memory management - File Management	Cognitive	4	Thirteenth
Questions & Answers	Lecture & Discussion	System Calls - What does system call mean? - Process Management System Calls - File Management System Calls - System calls for managing directories and folders	Cognitive-affectional	4	Fourteenth
Questions & Answers	Lecture & Discussion	Process Management - Key Concepts - Process, Task, Function, Thread - Activation period (activation) of CPU and I/O devices - Process model (template), shutdown, termination, scaling and status of the process - Process control block	Cognitive	4	Fifteenth
Questions & Answers	Lecture & Discussion	- Threading- Heavy and lightweight operations - Why use threads? - Threading levels - Regular and irregular multiprocessing - Process and thread synchronization	Cognitive	4	Sixteenth
Questions & Exercises	Lecture & Discussion	Scheduling - An introduction to scheduling:-Scheduling in batch systems - Scheduling in interactive systems - Scheduling in real-time systems - Process Scheduling - Queue Scheduling	Cognitive	4	Seventeenth
Questions & Exercises	Lecture & Discussion	• CPU Scheduling - Preventive and Non-Preventive Scheduling	Cognitive	4	Eighteenth

		- Sender- Scheduling Criteria - Evaluating Scheduling Algorithms			
Questions & Exercises	Lecture & Discussion	Processor Scheduling Algorithms - First-in-first-out (FIFO) scheduling algorithm - Shorter Job Scheduling Algorithm - Preference Scheduling Algorithm- Round Robin Scheduling Algorithm - Queuing Scheduling	Cognitive	4	Nineteenth
Questions & Exercises	Lecture & Discussion	Applied examples of scheduling algorithms	Cognitive	4	Twentieth
Questions & Exercises	Lecture & Discussion	Memory management - Logical and Real Memory - Logical and physical address space - Memory word size - Address mapping - in-memory - Shared Libraries - Binding at power-up	Cognitive-affectional	4	Twenty-one
Questions & Exercises	Lecture & Discussion	• Swap (swap) - Adjacent (contact) memory allocation - Single Segment Allocation - Multi-partition allocation - External and internal fragmentation	Cognitive-affectional	4	Twenty-second
Questions & Exercises	Lecture & Discussion	Virtual Memory - Browsing - The basic idea of navigation - Table of pages - Speeding up browsing - Examples of using the browsing method	Cognitive-affectional	4	Twenty-third
Questions & Exercises	Lecture & Discussion	- Browsing by page - Slow Evaluation - Page Replacement - Page replacement algorithms: - First-in-first-out (FIFO) algorithm - The algorithm for the page with the lowest usage	Cognitive-affectional	4	Twenty-four
Questions & Exercises	Lecture & Discussion	Principles of Physical Components of I/O Devices - I/O Devices - Device Control Circuits - Memory Map I/O - Direct Memory Access	Cognitive-affectional	4	Twenty-fifth
Questions &	Lecture &	Principles of I/O Device Software	Cognitive	4	Twenty-sixth

Exercises	Discussion	Components - Programmed I/O - Interrupt-based I/O - DMA-based I/O			
Questions & Exercises	Lecture & Discusion	Case studies showing the strengths and weaknesses of the Windows and Linux operating systems	Cognitive-affectional	4	Twenty-seventh–Thirtieth

11. Course Evaluation
➢ Daily quizzes and exams. ➢ Consulting students and encouraging them to participate actively. ➢ Lecture discussion. ➢ Extra–curricular activities. ➢ Quarterly exams and attendance.

12. Learning and Teaching Resources	
	Required textbooks (syllabus if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports ….)
	Electronic references, websites

Course description form

1. Course Name
Systems Analysis
2. Course Code
CST203
3. Year \ Semester
Yearly \ Second
4. Preparation Date of this description
10\ 10\ 2022
5. Available attendance forms
Mandatory (theoretical and practical lectures)
6. Number of study hours (total)/number of units (total)
Number of theoretical hours (1)

Number of practical hours (2)
Total hours(3)
Total number of units (6)

7. The name of the course leader (if more than one name is mentioned)

duha.amer@atu.edu.iq Name: Duha Amer Mehdi E-mail:

8. Course Objectives

This course aims to introduce students to the basic concepts of systems, their analysis, characteristics, levels and types, as well as train them to analyse and design systems using a range of analysis and design tools.	**Course Objectives**

9. Teaching and Learning Strategies

• Lecture Method • Teaching in laboratories to acquire practical skills • Team work • Assignments for students	**Strategies**

10. Course Structure

Evaluation method	Learning method	Unit or topic name	Required learning outcomes	hours	week
Questions & Answers	Lecture & Discussion	Basic concepts in the analysis and design of computer-based information systems: System - Concept of system - General characteristics of the system - System boundaries - Levels of the system - General model of the system - Types of systems Information: Characteristics of good information, sources of information - paper sources - electronic sources - audio sources. Importance of information - Forms of information , General discussion.	Cognitive - affectional	3	First - Third
Questions & Answers	Lecture & Discussion	Computer Information Systems Computer : Computer Functions Computer features - Components	Cognitive - affectional	3	Fourth - Seventh

		of computer information systems - Components of computer information systems - Components of computer information system - The process of building and developing computer information. Stages of computer information system development - Analysis stage Design stage - Implementation stage Objectives of Computer Information Systems - Types of Computer Information Systems Database-based management information systems - Databases The most important computer information systems based on databases: Data processing systems - Transaction and information processing systems - Management information systems - Decision support systems - Group decision support systems - Executive information systems. نظComputer information systems based on knowledge bases: Knowledge bases The most important computer information systems based on knowledge bases: Intelligent Systems (Artificial Intelligence) - Expert Systems - Neural Networks. Computer Information Systems Environments: Information systems that support the work of individuals - Information systems that support the work of groups Information Systems Analyst and Designer computing Systems Analyst: Qualifications of the systems analyst - Personal qualities of the systems analyst - Major issues facing the systems analyst - Evolution of the systems analyst's relationship with the end-user - Evolution of the systems analyst's relationship with			

		the end-user: The old way - Disadvantages of the old way - The modern way. Analyst Employers Systems Analyst - Systems Analysis Company - Information Management in an organization. Systems Analysis Team: Reasons for the failure of computer information systems development in some organizations. Information systems development methods and methodologies: Types of IS development methods - Lifecycle method Systems Development - Stages of the SDLC - Phased Development Method - Phased Development Method Stages of the phased development method - Team-based development method - Initial modelling method - Incremental (evolutionary) method - Similarity modelling method - Disadvantages of modelling - Uses of modelling - Accelerated development method - Top-down analysis method - Bottom-up analysis method - Synthesis method. Factors in choosing the right method - Information systems development methodologies - Classification of development methodologies. Types of development methodologies: System Analysis and Structural Design Methodologies - Information Engineering Methodology - Computer Aided Software Engineering Tools - Types of tools - Main functions of software engineering tools - Advantages of software engineering tools. Ready-made packages methodology: Advantages - Where to get ready-made			

		packages General discussion			
Questions & Exercises	Lecture & Discussion	Stages of analysing and designing computer-based information systems System analysis phase (preliminary study) - Information gathering phase - Sources of information required to analyse the existing system. Methods of collecting and validating information within the organisation I: Methods of collecting information II: Methods of validating the collected information Methods information collecting: Personal interview - Advantages of the personal interview method - Disadvantages of the personal interview - Obstacles of the interview. Questionnaire: Factors for choosing a questionnaire to collect information - preparation before distributing the questionnaire - rules of questions in the questionnaire - preparation during the distribution of the questionnaire - the most important activities after the questionnaire - advantages of the questionnaire - disadvantages of the questionnaire - examples of uses of the questionnaire. Observation - Analyzing documents -Methods of validation Lecture (presentation) - Preparation before the lecture - Preparation during the lecture - Activities after the lecture Team meetings Preparation before the team meeting - Team meeting - Problems of team meetings.	Cognitive-affectional	3	eighth – Fifteenth

		Group development of applications Advantages of the JAD method Disadvantages of the JAD method Problem definition and feasibility study Problem definition Problem techniques Steps to understanding and solving the issue Feasibility study Solutions subject to feasibility study Potential decisions General discussion Continued: System Analysis Phase (Detailed Study) Preferential Study Phase First: Analysing System Processes System Functions Model Definition of the System Function Model Objectives of the system functionality model Characteristics of the system function model The process of defining system functionality Data flow diagram The importance of a data flow diagram Elements of a data flow diagram Levels of a data flow diagram Characteristics of a data flow diagram Steps to prepare a data flow diagram II: Analyzing System data Data modelling Data modelling schemes Relational databases			

		Components of relational databases Entity-Relationship Model Relationships Median table in a many-to-many relationship Entity score Relationship score Relationship schema From Entity-Relationship Model to Relationship Diagram Entity Life History Chart Symbols used in the entity life history diagram Example: "Apply" life history Petri nets Symbols used in Petri Nets Process descriptions Process characterization tools Structural language Characterization methods Decision tables Steps for creating decision tables Data dictionary The importance of a data dictionary Description of system components Data Dictionary Examples Data classification Characteristics of data classification Types of classification Data coding Characteristics of good coding Types of coding Coding errors Relationship analysis Normative relationships Levels of normative relationships Non-normative relationship definition First normative rule definition Justified redundancy Unwarranted redundancy			

		Second Normative Rule Definition Third Normative Rule Definition Codd-Boyce Normative Relationship Definition Fourth Normative Rule Definition Fifth Normative Relationship Definition Analyzing document data in a Normative relationships (normalization) Normalization rules (normative/normalization rules) Applying the three normalization rules Action steps for analyzing document data Notes Optimal model System modelling Definition of modelling Modelling components Stages of system modelling (in the analysis phase) The physical model of the existing system Logical model of the existing system Steps for modelling the logical model of the existing system Outputs of the analysis phase General discussion			
Questions & Exercises	Lecture & Discussion	د Systems Development Lifecycle - Design Phase Generic Design Phase Developing the logic model of the new system Designing the logic model of the new system " Make adjustments" method " Redesigning processes" Preparing the physical model of the new system Steps for designing the physical model of the new system Detailed design phase	Cognitive-affectional	3	Sixteenth – Seventeenth

		Other activities Designing interfaces Interfaces Types of User Interfaces Input /Output Design Output design Input design Input /Output Characteristics Designing reports Types of reports Benefits of reports Characteristics of good reports Possible mistakes in report design Model Design Objectives of modelling Characteristics of a good model Modelling steps Database design Points to consider when designing a database Database design tools Software design Characteristics of good software General discussion			
Questions & Exercises	Lecture & Discussion	System Development Lifecycle - 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 Conversion Parallel Conversion Strategy Parallel conversion Progressive conversion strategy Evaluation and maintenance phase Evaluation phase	Cognitive - affectional	3	Eighteenth – Nineteenth

		Maintenance phase Documentation			
Questions & Exercises	Lecture & Discussion	Computer Information Systems Security Introduction Computer Information System Security Characteristics of a computer information system security system Elements of a computer information system security system Personals Data security Software security Hardware Security Communications and Network Security Types of breaches in computer information system security Computer viruses Virus damage Computer crimes Methods of dealing with the risk of hacking a computer information system The cost of designing a security system for a computer information system General discussion	Cognitive-affectional	3	Twentieth
Questions & Exercises	Lecture & Discussion	Analyse and design information systems based on knowledge bases Knowledge-based systems Knowledge Expert Knowledge bases Types of knowledge Knowledge representation Knowledge-based system Components of a knowledge system Basic components of expert systems Knowledge base	Cognitive - affectional	3	Twenty-first - Twenty-second

		Inference machine The knowledge engineer User Interfaces Interpreting inference Comparing knowledge bases and databases Components of a knowledge base system Knowledge base systems Analysing and designing knowledge base systems Analysis phase Design phase Development and programming Implementation and testing Maintenance phase Applications of knowledge base systems Artificial intelligent Fields of application of artificial intelligence Expert Systems Applications of Expert Systems files Conclusion Transforming data into knowledge and wisdom General discussion			
Questions & Exercises	Lecture & Discussion	Object Oriented Analysis and Design Key concepts of object-oriented analysis and design Unified modelling language Object modelling Object architecture Stages of object-oriented modelling Identifying the system's constituent objects Defining the properties of each object Defining events Identify the operations of each object Specify the properties of each operation Define the temporal order of	Cognitive-affectional	3	Twenty-second – Twenty-sixth

		operations Implementing the system Methods for modelling the objects that make up the system Features of the Unified Modelling Language Layers of the Unified Modelling Language The first layer: the user object layer. The second layer: Layer Model The third layer: Beyond the model Layer Four : Layer beyond the model Modelling using the Unified Modelling Language Modelling diagrams Use Case Diagramming Writing Use Cases Difficulties in writing use cases Class Diagrams (Categories) Components of class diagrams Disadvantages of class diagrams Interactive diagrams Collaboration diagrams Sequence diagrams Case diagrams Physical diagrams Component diagrams Processing diagrams UML models. Waterfall Form Advantages of the waterfall model Disadvantages of the waterfall model Waterfall Model Problems The spiral model Disadvantages of the Spiral Model The Incremental Iterative Model Initiation phase Detailing phase Construction phase			

Questions & Exercises	Lecture & Discussion	Transitions Duplicates Temporal Restriction Benefits of time constraints Typical project timelines General discussion Projects General guidelines and general ideas Types of computerized systems General guidelines before starting the project Important cautions Key project items	Cognitive-affectional	3	Twenty-seventh–Thirtieth

11. Course Evaluation
➢ Daily quizzes and exams. ➢ Consulting students and encouraging them to participate actively. ➢ Lecture discussion. ➢ Extra-curricular activities. ➢ Quarterly exams and attendance.

12. Learning and Teaching Resources	
	Required textbooks (syllabus if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports ….)
	Electronic references, websites

Course description form

1. Course Name
V.Basic Programming Language
2. Course Code
CST204
3. Year \ Semester
Yearly \ Second
4. Preparation Date of this description
10\ 10\ 2022
5. Available attendance forms

Mandatory (theoretical and practical lectures)
6. Number of study hours (total)/number of units (total)
Number of theoretical hours (2) Number of practical hours (3) Total hours(5) Total number of units (10)
7. The name of the course leader (if more than one name is mentioned)
Name: Salman Abd Kadhum
8. Course Objectives

Introduce the student to advanced techniques and integrated programs in the VB language through database programming and delve into the details of some table tools and report generation, then move on to OOP object–oriented programming with details of its principles and then deal with web page programming.	**Course Objectives**

9. Teaching and Learning Strategies	
• Lecture Method • Teaching in laboratories to acquire practical skills • Team work • Assignments for students	**Strategies**

10. Course Structure

Evaluation method	Learning method	Unit or topic name	Required learning outcomes	hours	week
Questions & Exercises	Lecture & Discussion	)Integrated Development Environment(IDE) Integrated Windows Development Environment Integrated Menus Development Environment -Tool Bars *Creating First Program - Program Idea -Creating Project. -Design Forms	Cognitive	5	First

		-Codes -Runs & Updating -Compiling.			
Questions & Exercises	Lecture & Discussion	Forms. -Properties Name. -Size & Location. - Font & Color. -Tab mouse. *Event - Mouse Event. -Keyboard Event. *Form Window. - Properties form. -Form - Menus.	Cognitive	5	Second
Questions & Exercises	Lecture & Discussion	Toolbox. -Label - Textbox. -Command button - Checkbox. -Option button - List box.- Combo box -Picture box. -Image box - Scrollbar. -Files list box.	Cognitive-affectional	5	Third
Questions & Exercises	Lecture & Discussion	Programming Language. -Variables and Constants. -Variables. -Constants. Arithmetic's expressions and effects - Expression - Operators. - Logic & relational Expression.	Cognitive-affectional	5	Fourth
Questions & Exercises	Lecture & Discussion	Inputs & Outputs. - Mesgbox & Inputbox. - Print. .*Control .-If-Then -And, Or, Not. -Nested –If -Select-Case.	Cognitive	5	Fifth
Questions & Exercises	Lecture & Discussion	Loop. -For-Next. -Do-While-Loop. -Do-Until-Loop. -Do-Loop.	Cognitive	5	Sixth
Questions & Exercises	Lecture & Discussion	- Arrays -One-Dimension Array. -Two-Dimension Array - Collections	Cognitive	5	Seventh
Questions & Exercises	Lecture & Discussion	- Subroutines& Procedures. -Subroutines. -Procedures& Functions	Cognitive	5	eighth – ninth

		-Library Functions. -Procedures. .-Functions			
Questions & Exercises	Lecture & Discussion	.Standard Module -Records. .Files -Sequential Files. - Random Files.	Cognitive	5	Tenth – Twelfth
Questions & Exercises	Lecture & Discussion	- Data Base Programming. -Basic Database. - Access Database.	Cognitive	5	Thirteenth
Questions & Exercises	Lecture & Discussion	- Objects in databases (ADO). Connection - Record set - Command.	Cognitive	5	Fourteenth
Questions & Exercises	Lecture & Discussion	Tools and reports -Data Grid- -Flex Grid Data Combo. -Data List - Crystal Reports.	Cognitive	5	Fifteenth
Questions & Exercises	Lecture & Discussion	Object-oriented programming (OOP) - Introduction to OOP - Themes OOP. - Building Classes.	Cognitive	5	Sixteenth – Seventeenth
Questions & Exercises	Lecture & Discussion	Objects will be used - Memory Image Object. -Binding. - Delete& Update Object.	Cognitive	5	Eighteenth
Questions & Exercises	Lecture & Discussion	Multiple Interfaces and Inheritance - Polymorphism. -Inheritance. - Relations between Classes. -Collection Classes.	Cognitive	5	Nineteenth
Questions & Exercises	Lecture & Discussion	Visual Basic Advanced Applications. -API.(Application Programming Interface . - Advanced Use of Models	Cognitive	5	Twentieth – Twenty-one
Questions & Exercises	Lecture & Discussion	Component Programming -Com. - Introduction to Com - ActiveX EXE projects. - ActiveX DLL projects.	Cognitive	5	Twenty-second – Twenty-third

Questions & Exercises	Lecture & Discussion	Internet Programming. - Dynamic DHTML Pages - Introduction to Vb Script - Introduction to DHTML.	Cognitive	5	Twenty-four – Twenty-fifth
Questions & Exercises	Lecture & Discussion	ASP for Server - Introduction to IIS - Introduction to ASP	Cognitive	5	Twenty-sixth – Twenty-seventh
Questions & Exercises	Lecture & Discussion	Miscellaneous Apps	Cognitive-affectional	5	Twenty-eighth – Twenty-ninth
Questions & Exercises	Lecture & Discussion	Building an integrated application system	Cognitive-affectional	5	Thirtieth

11. Course Evaluation

- Daily quizzes and exams.
- Consulting students and encouraging them to participate actively.
- Lecture discussion.
- Extra-curricular activities.
- Quarterly exams and attendance.

12. Learning and Teaching Resources

	Required textbooks (syllabus if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports ….)
	Electronic references, websites

Course description form

1. Course Name

Computer Networks

2. Course Code

CST205

3. Year \ Semester

Yearly \ Second

4. Preparation Date of this description
10\ 10\ 2022
5. Available attendance forms
Mandatory (theoretical and practical lectures)
6. Number of study hours (total)/number of units (total)
Number of theoretical hours (1) Number of practical hours (2) Total hours(3) Total number of units (6)
7. The name of the course leader (if more than one name is mentioned)
Name: Ali Husein Kadhum
8. Course Objectives

Introduce the student to networks, their usefulness, technologies, types, types of connectivity, types of connection media, various physical components, and approved network standards, as well as the Internet, computer security, and networking.	**Course Objectives**

9. Teaching and Learning Strategies	
• Lecture Method • Teaching in laboratories to acquire practical skills • Team work • Assignments for students	**Strategies**

10. Course Structure

Evaluation method	Learning method	Unit or topic name	Required learning outcomes	hours	week
Questions & Exercises	Lecture & Discussion	Introduction to computer networks: An overview of the networking architecture: - Provider (Server): Types of providers - Client - Recognizing Peer To Peer Networks - Recognize Client/Server Networks(	Cognitive – affectional	3	First

Questions & Answers	Lecture & Discussion	Recognize the main components of networks: Physical: Hardware - Cartridges - Media - Peripherals Software: Network operating system software - Communication protocols - Network management systems	Cognitive	3	Second
Questions & Exercises	Lecture & Discussion	An overview of basic network designs: - Things to consider when designing a network - Linear Bus type networks - Ring-type networks - Star networks - Ethernet networks - Token Ring Networks - Token Passing	Cognitive	3	Third - Fourth
Questions & Exercises	Lecture & Discussion	An overview of the types of networking: - Depending on the networking method: Single Point Networking Multipoint networks - Depending on the geographical coverage: - Local Area Network (LAN), Local Area Network (LAN) devices, Local Area Network Specifications - Metropolitan Area Network (MAN) Metropolitan Area Network, Regional Area Network Devices, Specifications, Measurements and Technologies - Wide Area Network (WAN), Wide Area Network (WAN) devices, specifications, measurements and technologies - Advanced Wide Area Networks: Internet, Intranet, Extranet, Extranet	Cognitive	3	Fourth - Fifth
Questions & Exercises	Lecture & Discussion	Recognize Network Interface Cards: - Network Adapter Cards Definition	Cognitive	3	Sixth

		- Types of Network Interface Cards - Network Card Installation and Setup Overview - Network Interface Card Installation Overview			
Questions & Answers	Lecture & Discussion	Wires (The cables) used in networks: - Recognize the types and characteristics of network wires: - Twisted Pair - Coaxial Cable - Fiber Optic	Cognitive	3	Seventh
Questions & Exercises	Lecture & Discussion	An overview of the modes of communication between network elements: - Wired communication media - Wireless communication media	Cognitive	3	eighth - ninth
Questions & Exercises	Lecture & Discussion	Bandwidth, Importance of Bandwidth, Measurements, Limitations, Throughput, Calculation of data transfer	Cognitive	3	Tenth – eleventh
Questions & Exercises	Lecture & Discussion	General principles of communication devices used in networks: - Modems - Network Interface Cards (NICs) - Repeaters - Hubs - Switches - Bridges - Routers R outers -Gateways	Cognitive	3	Twelfth – Thirteenth
Questions & Exercises	Lecture & Discussion	Principles of Network Protocols: - What is a protocol? Protocol work - Protocol advantages - Protocol disadvantages - The functions of protocols in the sending device and their functions in the receiving device - The concept of Binding - Description of the TCP/IP protocol and its most important features	Cognitive	3	Fourteenth – Sixteenth
Questions & Exercises	Lecture & Discussion	Principles of the OSI Reference	Cognitive	3	Seventeenth – Nineteenth

		Model: - The basic principles behind the OSI reference - Describe the functions of the 7 Layers that make up the OSI Reference Model: Recognize the functions of the lower three layers Recognize the functions of the top three layers Recognizing the functions of the middle class - Protocols used for inter-layer communication - The steps of Encapsulation and De Encapsulation - A description of the services available at the OSI reference layers An idea about the IEEE standardization model: Description of the idea of networking, ways to develop security methods for networking			
Questions & Exercises	Lecture & Discussion	- IP Addresses and Network Masks - IP Address Categories - Physical MAC Address - Address Resolution Protocol (ARP) - Techniques for dividing the network into subnets	Cognitive	3	Twentieth – Twenty-second
Questions & Exercises	Lecture & Discussion	An overview of the Virtual Private Network (VPN): - Virtual Network Features - Virtual Networking Components - Virtual Network Protocols Virtual Network Conceptual Structure	Cognitive	3	Twenty-third – Twenty-four
Questions & Answers	Lecture & Discussion	Principles of network security: - Threats to networks and vulnerabilities - Possible methods and means of protection against threats - Solving common network issues Components of computer and network security:	Cognitive	3	Twenty-fifth – Twenty-seventh

		- Human Resources - Hardware - Software - Databases Principles of network vulnerabilities, types of breaches, and prevention methods Modern espionage methods on networks and computer centers Overview of computer and network crimes Overview of Legal Legislation			
Questions & Exercises	Lecture & Discussion	Cryptography Principles, Methods and Types Creative cryptographic methods Compensatory Cryptography	Cognitive	3	Twenty-eighth – Thirtieth

11. Course Evaluation

- Daily quizzes and exams.
- Consulting students and encouraging them to participate actively.
- Lecture discussion.
- Extra-curricular activities.
- Quarterly exams and attendance.

12. Learning and Teaching Resources

	Required textbooks (syllabus if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports ….)
	Electronic references, websites

Course description form

1. Course Name

Web Design
2. Course Code
CST206
3. Year \ Semester
Yearly \ Second
4. Preparation Date of this description
10\ 10\ 2022
5. Available attendance forms
Mandatory (theoretical and practical lectures)
6. Number of study hours (total)/number of units (total)
Number of theoretical hours (1) Number of practical hours (2) Total hours(3) Total number of units (6)
7. The name of the course leader (if more than one name is mentioned)
Name: Munaf Hamzah Kareem
8. Course Objectives

Introduce the student to dealing with websites and how to manage them, and enable the student to design websites, upload and deal with servers and the different languages used on the Internet networks.	**Course Objectives**

9. Teaching and Learning Strategies	
• Lecture Method • Teaching in laboratories to acquire practical skills • Team work • Assignments for students	**Strategies**

10. Course Structure

Evaluation method	Learning method	Unit or topic name	Required learning outcomes	hours	week
Questions & Answers	Lecture & Discussion	Introduction to the Internet, websites, search engines and servers	Cognitive - affectional	3	First - Second
Questions &	Lecture &	Hypertext Markup Language	Cognitive	3	Third - Sixth

Exercises	Discussion	(HTML)			
Questions & Exercises	Lecture & Discussion	Introduction to FrontPage, Introduction to the Web, Selecting the content of a web page, Launching FrontPage, Creating a web site, Displaying or hiding the folder list, Opening a web page, Navigating between pages, Creating a blank web page, Creating a web page using templates, Saving a web page, Using the task panel, Opening a web site, Entering text, Deleting text, Printing a web page, Displaying the load time of a web page, Changing the view of a web page, Displaying the page in a web browser, Using the web page view, Using the web page view. Deleting a web page, searching for a web page, editing text (selecting text, undoing changes, adding icons), formatting web pages, applying an attribute to a web page, adding images, moving an image, providing alternative text for an image, adding a background image, creating an image gallery, customizing images, creating hyperlinks, creating hyperlinks, creating tables, working in an animation view, creating frames, creating forms, creating templates, adding effects to a web page, managing a web page, publishing a web page	Cognitive	3	Twelfthالسابع –
Questions & Exercises	Lecture & Discussion	the use of Java Script, what a JavaScript program will look like, declaring variables, arithmetic operators, logical operators, control statements, SWITCH, recursion, events, creating a button to send an email WHILE, functions, models, arrays, objects, literal strings Application information	Cognitive	3	Thirteenth – Sixteenth
Questions & Exercises	Lecture & Discussion	PHP, Introduction to PHP, Running	Cognitive	3	Seventeenth – Twenty-third

		Windows IIS 5. 0, Adding PHP to IIS, Adding MySQL to IIS, PHP File Structure, Internet Protocols, Comments, Comments, Numbers, Calculations, System Variables, Constants, Knowledge, Data Type Conversion, Time and Date Functions, Forms (GET, POST), Conditional Commands (IF statement, Boolean Operators, Multiple Conditions, Nested Conditional Statements, Switch statement, Getting rid of html tags) Repeats and arrays, array functions, array functions, array sorting, array functions, additional array functions, multi-dimensional arrays, code organization (Function, Print, variable range, stable variables, file inclusion), error tracking and prevention (types of errors, logical errors, error avoidance, Regular Expressions, character class syntax), client interaction, Cookies, Session, reading and writing information in a txt file			
Questions & Answers	Lecture & Discussion	MySQL, PostgreSQL, MS SQL and Oracle Database Management System (MY SQL)	Cognitive	3	Twenty-four – Twenty-seventh
Questions & Exercises	Lecture & Discussion	Web Site Management (Apache, IIS) Smart and database-driven websites	Cognitive	3	Twenty-eighth – Thirtieth

11. Course evaluation

- Daily quizzes and exams.
- Consulting students and encouraging them to participate actively.
- Lecture discussion.
- Extra-curricular activities.
- Quarterly exams and attendance.

12. Learning and Teaching Resources

	Required textbooks (syllabus if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports ….)
	Electronic references, websites

Course Description Form

1. Course Name	
C++ Programming – I	
2. Course Code	
CST100	
3. Year / Semester	
First / Semester	
4. Date this description was prepared	
10/10/2024	
5. Available forms of attendance	
Mandatory (theoretical and practical lectures)	
6. Number of study hours (total) / Number of units (total)	
number of theoretical hours (2) number of practical hours (2) Total number of hours (4) Total number of units (4)	
7. Name of the course administrator (if more than one name is mentioned)	
Name:	Email:
8. Course Objectives	
Introducing the student to programming languages, their types, the C++ language, the general structure of the program and its sections, the types of data used in this language, writing the programming code for programs, states, procedures, data files, and using the drawing capability in it.	**Course objectives**
9. Teaching and learning strategies	
Lecture Method: • Laboratory Instruction to Acquire Practical Skills • Student Groups (Team Work)	strategy

• Assignments • Homework for Students	

10. Course Structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	the hours	Week
questions and answers	Lecture and Discussion	- A Summary of Programming Languages - What is a Programming Language? - History and Development of Programming Languages - Levels of Programming Languages	cognitive - emotional	5	The first
questions and exercises	Lecture and Discussion	- Essential C++ Basics / C++ Concepts - What does a C++ program contain? - What are the core files? A simple explanation of the core files included in a C++ program - C++: Its beginnings, development, and position within the programming language ranks	cognitive	5	2nd
questions and exercises	Lecture and Discussion	Basic Elements and Tools in C++ Language Symbols Definition Names Reserved Words Representing Constants Representing Variables	cognitive	5	3rd
questions and exercises	Lecture and Discussion	Data types in C++ and how they are represented in memory Character type (char) Integer type (int) Real type (float/double) Boolean type Converting between different data types	cognitive	5	4th
questions and exercises	Lecture and Discussion	Types of expressions in C++ and how to formulate them: Arithmetic expressions / Different arithmetic operations and their priorities / How to convert a	cognitive	5	5th

		mathematical expression to an expression in C++ / Various examples			
questions and answers	Lecture and Discussion	Relational Expressions / Relational Operations and Their Priorities / Forming a Relational Expression Logical Expressions / Logical Operations and Their Priorities / Forming a Logical Expression Compound Expressions / General Operation Priorities Table / Various Examples	cognitive	5	6th
questions and exercises	Lecture and Discussion	Assigning initial values to constants and variables Spaces and parentheses Comment types Special tools	cognitive	5	7th
questions and exercises	Lecture and Discussion	Primary Tools (Minimum Tools - Mini Tools)	cognitive	5	8th
questions and exercises	Lecture and Discussion	Assignment Statement and its Types with Illustrative Examples Arithmetic Expressions (Equations) Counters and Their Types Different Forms of Equations in C++	cognitive	5	9th
questions and exercises	Lecture and Discussion	Formatted and Unformatted I/O Functions Text Output Numeric Values Arithmetic Expressions Output	cognitive	5	10th – 11th
questions and exercises	Lecture and Discussion	Control, Conditional, and Repetition Statements Conditional Statements Conditional Tools If Statement If...else Statement Nested Conditional Statements	cognitive	5	12th
questions and exercises	Lecture and Discussion	Switch Conditional Statement Nested Conditionals	cognitive	5	13th
questions and exercises	Lecture and Discussion	Loops The for loop Nested loops using for	cognitive	5	14th - Fifteenth

11. Course evaluation

- • Direct questions and daily exams.
- Motivating students and encouraging them to participate actively.

• Discussion in lectures. • Extra activities. • Midterm exams and actual attendance.	
12. Learning and teaching resources	
	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)
	Electronic references, websites

Course Description Form

1. name Course
Computer Networking Basics
2. Code Course
CST200
3. Semester/Year
Semester / First
4. Date this description was prepared
10/10/2024
5. Available forms of attendance
Mandatory (theoretical and practical lectures)
6. Number of study hours (total) / Number of units (total)
numbers of theoretical hours (2) Number of practical hours (2) Total hours (4) Total number of units (4)
7. Name of the course administrator (if more than one name is mentioned)
The Name: Email:
8. Course objectives

Introducing the student to networks, their benefits, technologies, types, types of connections, types of connection media, different physical components, and approved network standards. The student also learns	**Course objectives**

about the Internet and computer and network security.	

9. Teaching and learning strategies

Lecture method Laboratory education to acquire practical skills Student groups (team work) Tasks - Homework for Students	**strategy**

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	the hours	Week
questions and answers	Lecture and Discussion	Introduction to Computer Networks	cognitive - emotional	4	The First
questions and exercises	Lecture and Discussion	Types of computer networks	cognitive	4	2nd
questions and exercises	Lecture and Discussion	Physical Network Topologies	cognitive	4	3rd
questions and exercises	Lecture and Discussion	Physical Media (such as copper wires, optical fibers, wireless signals, etc.)	cognitive	4	4th – 5th
questions and exercises	Lecture and Discussion	Open Systems Interconnection Model and Protocols	cognitive	4	6th – 7th
questions and answers	Lecture and Discussion	Network devices (e.g., hub, switch, router, firewall, etc.)	cognitive	4	8th
questions and exercises	Lecture and Discussion	IP addresses (IPv4 and IPv6)	cognitive	4	9th – tenth
questions and exercises	Lecture and Discussion	Subnetting an IP address	cognitive	4	11th – 12th
questions and exercises	Lecture and Discussion	Ethernet LANs, Switches and Spanning Tree Protocol (STP)	cognitive	4	13th
questions and exercises	Lecture and Discussion	Virtual Local Area Networks (VLAN)	cognitive	4	14th
questions and exercises	Lecture and Discussion	Wireless Local Area Networks (WLAN)	cognitive	4	Fifteenth

11. Course Evaluation

- • Direct questions and daily exams.
- Motivating students and encouraging them to participate actively.
- Discussion in lectures.
- Extra activities.
- Midterm exams and actual attendance.

12. Learning and teaching resources	
	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)
	Electronic references, websites

Course Description Form

13. name Course	
Computer Networking Basics	
14. Course code	
CST200	
15. Semester/Year	
semester / first	
16. Date this description was prepared	
10/10/2024	
17.Available forms of attendance	
Mandatory (theoretical and practical lectures)	
18. Number of study hours (total) / Number of units (total)	
numbers of theoretical hours (2) Number of practical hours (2) Total hours (4) Total number of units (4)	
7- Name of the course administrator (if more than one name is mentioned)	
The Name: Email:	
19. Course objectives	
Introducing the student to networks, their benefits, technologies, types, types of connections, types of connection media,	**Course objectives**

different physical components, and approved network standards. The student also learns about the Internet and computer and network security.	

20. Teaching and learning strategies

Lecture Method Laboratory education to acquire practical skills Student groups (team work) Tasks - Homework for Students	**strategy**

21. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	the hours	Week
questions and answers	Lecture and Discussion	مقدمة في شبكات الحاسوب	cognitive - emotional	4	The first
questions and exercises	Lecture and Discussion	أنواع شبكات الحاسوب	cognitive	4	2nd
questions and exercises	Lecture and Discussion	الطوبولوجيا الفيزيائية للشبكات (Physical Network Topologies)	cognitive	4	3rd
questions and exercises	Lecture and Discussion	الوسائط الفيزيائية (Physical Media) (مثل الأسلاك النحاسية، الألياف البصرية، الإشارات اللاسلكية...)	cognitive	4	4th – 5th
questions and exercises	Lecture and Discussion	نموذج الاتصال المفتوح OSI والبروتوكولات (Open Systems Interconnection Model & Protocols)	cognitive	4	6th – 7th
questions and answers	Lecture and Discussion	أجهزة الشبكات (مثل: الموزّع (Hub)، المحول (Switch)، الموجّه (Router)، الجدار الناري (Firewall)(...	cognitive	4	8th
questions and exercises	Lecture and Discussion	عناوين IP (الإصدار الرابع IPv4 والإصدار السادس IPv6)	cognitive	4	9th – tenth
questions and exercises	Lecture and Discussion	تقسيم عنوان IP إلى شبكات فرعية (Subnetting)	cognitive	4	11th – 12th
questions and exercises	Lecture and Discussion	شبكات الإيثرنت المحلية (Ethernet LANs) والمحوّلات وبروتوكول الشجرة الممتدة (Switches and Spanning Tree Protocol - STP)	cognitive	4	13th
questions and exercises	Lecture and Discussion	الشبكات المحلية الافتراضية (VLAN - Virtual LAN)	cognitive	4	14th
questions and exercises	Lecture and Discussion	الشبكات المحلية اللاسلكية (WLAN - Wireless LAN)	cognitive	4	Fifteenth

22. Course Evaluation

- • Direct questions and daily exams.
- Motivating students and encouraging them to participate actively.
- Discussion in lectures.
- Extra activities.
- Midterm exams and actual attendance.

23. Learning and teaching resources

	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)
	Electronic references, websites

Course Description Form

1. name Course
logical design
2. Course code
CST103
3. Semester/Year
semester / first
4. Date this description was prepared
10/10/2024
5. Available forms of attendance
Mandatory (theoretical and practical lectures)
6. Number of study hours (total) / Number of units (total)
numbers of theoretical hours (2) Number of practical hours (2) Total hours (4) Total number of units (4)
7. 7. Name of the course administrator (if more than one name is mentioned)
The Name: Email:
8. Course objectives

Introducing the student to the types of computers, numerical systems, and	**Course objectives**

conversion between them. Then, it addresses the representation of numbers in digital calculators, Boolean algebra, the hardware components of electronic computers, machine languages, and data representation.	

9. Teaching and learning strategies

Lecture Method Laboratory education to acquire practical skills Student groups (team work) Tasks - Homework for Students	**strategy**

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	the hours	Week
questions and answers	Lecture and Discussion	Number Systems • Binary, Octal, Decimal, and Hexadecimal • Converting from Other Number Systems to Decimal • Converting from Decimal to Other Systems • Converting from Binary to Octal and Hexadecimal • Binary Coded Decimal (BCD)	cognitive - emotional	4	The first
questions and exercises	Lecture and Discussion	Binary Arithmetic Operations • Addition, Subtraction, Multiplication, and Division • Representing Negative Numbers • 2's Complement Numbers • 1's Complement Numbers	cognitive	4	2nd
questions and exercises	Lecture and Discussion	Subtraction using the complement • Subtraction using the r-complement • Subtraction using the (r – 1) complement	cognitive	4	3rd
questions and exercises	Lecture and Discussion	Logic gates • NOT •ANDو NAND •ORو NOR •XORو XNOR	cognitive	4	4th
questions and exercises	Lecture and Discussion	• Boolean Algebra • Boolean Variables	cognitive	4	5th

		• Boolean Expressions • Truth Table			
questions and answers	Lecture and Discussion	Network devices (e.g., hub, switch, router, firewall, etc.)	cognitive	4	8th
questions and exercises	Lecture and Discussion	• Fundamental identities in Boolean algebra • De Morgan's theorem • Algebraic manipulation • Function complement	cognitive	4	9th – 10th
questions and exercises	Lecture and Discussion	Subnetting an IP address	cognitive	4	11th – 12th
questions and exercises	Lecture and Discussion	) Ethernet LANs)Switches and Spanning Tree Protocol - STP(	cognitive	4	13th
questions and exercises	Lecture and Discussion	VLAN - Virtual LAN	cognitive	4	14th
questions and exercises	Lecture and Discussion	WLAN - Wireless LAN (	cognitive	4	Fifteenth

11. Course Evaluation

- • Direct questions and daily exams.
- Motivating students and encouraging them to participate actively.
- Discussion in lectures.
- Extra activities.
- Midterm exams and actual attendance.

12. Learning and teaching resources

	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)
	Electronic references, websites

Course Description Form

1. name Course
Mathematics and Numerical Analysis
2. Course code
CST104
3. Semester/Year
semester / first
4. Date this description was prepared
10/10/2024
5. Available forms of attendance
Mandatory (theoretical and practical lectures)
6. Number of study hours (total) / Number of units (total)
numbers of theoretical hours(2) Number of practical hours (2) Total hours (4) Total number of units (4)
7. Name of the course administrator (if more than one name is mentioned)
The Name: Email:

8. Course objectives

Introduces the student to the mathematical methods used to solve mathematical problems in a logical manner, including defining functions and their derivatives, differential and integral calculus, differential and difference equations, finding roots, differentiation, and numerical methods for solving problems. Mathematics is compared to mathematical methods, using computer applications, including MATLAB.	**Course objectives**

9. Teaching and learning strategies

Lecture Method Laboratory education to acquire practical skills Student groups (team work) Tasks - Homework for Students	**strategy**

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	the hours	Week
questions and answers	Lecture and Discussion	The concept of matrices, their types, and how to find their rank.	cognitive - emotional	4	The first + 2nd
questions and exercises	Lecture and Discussion	Equality of matrices and operations on them (addition, subtraction, and multiplication).	cognitive	4	3rd + 4th
questions and exercises	Lecture and Discussion	The determinant of a matrix and its relationship to the rank of the matrix, and the Sarrus method for calculating the value of the determinant.	cognitive	4	5th
questions and exercises	Lecture and Discussion	Inverse matrix and its relation to rank, cofactor method for finding the inverse matrix, solving a system of linear equations simultaneously using the inverse matrix of the coefficient matrix.	cognitive	4	6th -7th
questions and exercises	Lecture and Discussion	Differentiation rules for algebraic, trigonometric, exponential, and logarithmic functions. The derivative of a complex	cognitive	4	7^{th} – 8th

		function (the chain rule), implicit differentiation, and partial derivatives.			
questions and answers	Lecture and Discussion	Finding the approximate true root of a nonlinear equation over a given interval using iteration and Newton-Raphson methods.	cognitive	4	9th
questions and exercises	Lecture and Discussion	Integration rules for algebraic, trigonometric, exponential, and logarithmic functions. Integration by parts and integration using partial fractions.	cognitive	4	10^{th} – 12th
questions and exercises	Lecture and Discussion	The concept of infinite sequences and series and their types, Ratio & Root Tests to determine convergence or divergence.	cognitive	4	13^{th}- Fifteenth

11. Course Evaluation

- Direct questions and daily exams.
- Motivating students and encouraging them to participate actively.
- Discussion in lectures.
- Extra activities.
- Midterm exams and actual attendance.

12. Learning and teaching resources

	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)
	Electronic references, websites

Course Description Form

1. name Course
C++ programming –II
2. Course code
CST107
3. Semester/Year
semester / first
4. Date this description was prepared
10 /10/2024
5. Available forms of attendance
Mandatory (theoretical and practical lectures)
6. Number of study hours (total) / Number of units (total)
numbers of theoretical hours(2) Number of practical hours (2) Total hours (4) Total number of units (4)

7. Name of the course administrator (if more than one name is mentioned)	
The Name:	Email:

8. Course objectives	
Introducing the student to programming languages, their types, the C++ language, the general structure of the program and its sections, the types of data used in this language, writing the programming code for programs, states, procedures, data files, and using the drawing capability in it.	**Course objectives**

9. Teaching and learning strategies	
Lecture Method Laboratory education to acquire practical skills Student groups (team work) Tasks - Homework for Students	**strategy**

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	the hours	Week
questions and answers	Lecture and Discussion	repetition sentence (while)	cognitive - emotional	4	The first
questions and exercises	Lecture and Discussion	repetition sentence(do…while)	cognitive	4	2nd
questions and exercises	Lecture and Discussion	Repetition Control Continue Statement Exit Statement Go To Statement	cognitive	4	3rd
questions and exercises	Lecture and Discussion	Dimensional Variables: Matrices One-Dimensional Matrix	cognitive	4	4th
questions and exercises	Lecture and Discussion	Two-dimensional array Square array (as a special mode of two-dimensional array)	cognitive	4	5th
questions and answers	Lecture and Discussion	Symbolic array and string type representation	cognitive	4	6th
questions and exercises	Lecture and Discussion	Functions Global and Local Variables Function Definition Function Calling	cognitive	4	7th

		Function Calling Methods			
questions and exercises	Lecture and Discussion	How to retrieve a value from a function Parameters and arguments Factors affecting the use of functions	cognitive	4	8th
questions and exercises	Lecture and Discussion	Void functions User-defined functions	cognitive	4	9th
questions and exercises	Lecture and Discussion	Standard Function Library String Functions Arithmetic Functions Date and Time Functions	cognitive	4	10th
questions and exercises	Lecture and Discussion	Graphics and Screen Color Functions Point Drawing Functions Line Drawing Functions Rectangle Drawing Functions Circle Drawing Functions Pattern Drawing Functions Types of Screens	cognitive	4	11th – 13th
questions and exercises	Lecture and Discussion	Build a workable, integrated system, including the arrays and functions mentioned above.	cognitive	4	14th –Fifteenth

11. Course Evaluation

- • Direct questions and daily exams.
- Motivating students and encouraging them to participate actively.
- Discussion in lectures.
- Extra activities.
- Midterm exams and actual attendance.

12. Learning and teaching resources

	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)
	Electronic references, websites

Course Description Form

1. name Course
Website Design Basics
2. Course code
CST110
3. Semester/Year
semester / first
4. Date this description was prepared
10/10/2024
5. Available forms of attendance
Mandatory (theoretical and practical lectures)
6. Number of study hours (total) / Number of units (total)

numbers of theoretical hours (2)
Number of practical hours (2)
Total hours (4)
Total number of units (4)

7. Name of the course administrator (if more than one name is mentioned)

The Name: Email:

8. Course objectives

Introducing the student to programming languages, their types, the C++ language, the general structure of the program and its sections, the types of data used in this language, writing the programming code for programs, states, procedures, data files, and using the drawing capability in it.	Course objectives

9. Teaching and learning strategies

Lecture Method Laboratory education to acquire practical skills Student groups (team work) Tasks - Homework for Students	strategy

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	time hours	Week
questions and answers	Lecture and Discussion	Study the characteristics of the Internet and the types of applications used on it	cognitive - emotional	4	The first – 3rd
questions and exercises	Lecture and Discussion	Study of protocols for transferring web pages, files, and email over the Internet	cognitive	4	4th - 5th
questions and exercises	Lecture and Discussion	Repetition Control Continue Statement Exit Statement Go To Statement	cognitive	4	6th – 7th
questions and exercises	Lecture and Discussion	Design and delete a web page	cognitive	4	8th – 9th
questions and exercises	Lecture and Discussion	Programming with PHP and CSS	cognitive	4	10th -11th

questions and answers	Lecture and Discussion	Publish a page on the Internet	cognitive	4	12th – 13th
questions and exercises	Lecture and Discussion	Website management	cognitive	4	14th –Fifteenth

11. Course Evaluation
• • Direct questions and daily exams. • Motivating students and encouraging them to participate actively. • Discussion in lectures. • Extra activities. • Midterm exams and actual attendance.

12. Learning and teaching resources	
	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)
	Electronic references, websites

Course Description Form

1. name Course
Python programming
2. Course code
CST108
3. Semester/Year
semester / first
4. Date this description was prepared
10/10/2024
5. Available forms of attendance
Mandatory (theoretical and practical lectures)

6. Number of study hours (total) / Number of units (total)
numbers of theoretical hours) 2 (Number of practical hours (2) Total hours (4) Total number of units (4)
7. Name of the course administrator (if more than one name is mentioned)
The Name: Email:
8. Course objectives

Understand the basics of input and output, control structures, functions, sequences, and lists. **Design program logic and then implement these programs using the Python language. Understand programming concepts and problem-solving skills, without assuming prior programming experience.**	**Course objectives**

9. Teaching and learning strategies	
Lecture Method Laboratory education to acquire practical skills Student groups (team work) Tasks - Homework for Students	**strategy**

10. Course structure

Evaluation method	**Learning method**	**Name of unit or topic**	**Required learning outcomes**	**the hours**	**Week**
questions and answers	Lecture and Discussion	Introduction to Programming • Compilers and Interpreters • Input, Processing, and Output • Using the Python Language	cognitive - emotional	4	The First
questions and exercises	Lecture and Discussion	Variables • Print function • Numeric data types and numeric constants • Input function	cognitive	4	2nd
questions and exercises	Lecture and Discussion	Performing Arithmetic Operations / Math Operators • Floating Division and Integer	cognitive	4	3rd

		Division • Operator Precedence • Augmented (Composite) Assignment Operators			
questions and exercises	Lecture and Discussion	Decision-making Structure • If Statement • Boolean Expressions and Relational Operators • If-Else Statement	cognitive	4	4th
questions and exercises	Lecture and Discussion	Nested Conditional Structures • If-Else Statement • Logical Operators • Boolean Variables	cognitive	4	5th
questions and answers	Lecture and Discussion	Introduction to Loop Structures • While Loop: A conditional loop • For Loop: A countable loop • Using the range function with a for loop	cognitive	4	6th
questions and exercises	Lecture and Discussion	Introduction to Functions • Empty Functions and Functions That Return Values • Defining and Calling an Empty Function • Using Indentation in Python	cognitive	4	7^{th} – 8th
questions and exercises	Lecture and Discussion	• Introduction to functions that return values • Standard library functions and the import statement • Random number generation	cognitive	4	9^{th} – 10th
questions and exercises	Lecture and Discussion	Writing functions that return values Returning strings or logical values Returning more than one value Math unit	cognitive	4	11th
questions and exercises	Lecture and Discussion	Sequences Introduction to Lists The Recurrence Operator and the len() Function Indexing in Lists	cognitive	4	12th
questions and exercises	Lecture and Discussion	Modifying and concatenating lists Slicing lists Searching within lists using in Some useful list and Python functions	cognitive	4	13th
questions and exercises	Lecture and Discussion	Insert() Function Index() Function Tuples Converting Between Lists and Sets	cognitive	4	14th

questions and exercises	Lecture and Discussion	General review of all topics Comprehensive applications and mini-projects Evaluation exercises and a final exam (if applicable)	cognitive	4	Fifteenth

11. Course Evaluation

- • Direct questions and daily exams.
- Motivating students and encouraging them to participate actively.
- Discussion in lectures.
- Extra activities.
- Midterm exams and actual attendance.

12. Learning and teaching resources

	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)
	Electronic references, websites

Course Description Form

1. name Course
Wireless networks
2. Course code
CST108
3. Semester/Year
semester / first

4. Date this description was prepared
10/10/2024
5. Available forms of attendance
Mandatory (theoretical and practical lectures)
6. Number of study hours (total) / Number of units (total)
numbers of theoretical hours(2) Number of practical hours (2) Total hours (4) Total number of units (4)
7. Name of the course administrator (if more than one name is mentioned)
The Name: Email:
8. Course objectives

Provide theoretical and practical knowledge of wireless communication technologies to enable students to develop, implement, manage, and troubleshoot wireless networks.	**Course objectives**

9. Teaching and learning strategies	
Lecture Method Laboratory education to acquire practical skills Student groups (team work) Tasks - Homework for Students	**strategy**

10. Course structure

Evaluation method	**Learning method**	**Name of unit or topic**	**Required learning outcomes**	**the hours**	**Week**
questions and answers	Lecture and Discussion	Introduction to Wireless Communications	cognitive - emotional	4	The first - 2nd
questions and exercises	Lecture and Discussion	Technical Background - Transmission Basics - Communication Networks - Protocols and the TCP/IP Protocol Suite	cognitive	4	3rd - 6th
questions and exercises	Lecture and Discussion	Wireless Communications Technologies - Antennas and Wave Propagation - Signal Coding Techniques	cognitive	4	7th – 10th

		- Spread Spectrum - Coding and Error Control			
questions and exercises	Lecture and Discussion	Wireless Networks - Satellite Communications - Wireless Cellular Networks - Mobile Internet Protocol and Wireless Access Protocol	cognitive	4	10th- 12th
questions and exercises	Lecture and Discussion	Wireless Local Area Networks (WLANs) - Wireless Local Area Network Technology - Wi-Fi and the IEEE 802.11 standard - Bluetooth and the IEEE 802.15 standard	cognitive	4	13th –Fifteenth

11. Course Evaluation

- • Direct questions and daily exams.
- Motivating students and encouraging them to participate actively.
- Discussion in lectures.
- Extra activities.
- Midterm exams and actual attendance.

12. Learning and teaching resources

	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)
	Electronic references, websites

Course Description Form

1. name Course
Data communication

2. Course code
CST108
3. Semester/Year
semester / first
4. Date this description was prepared
10/10/2024
5. Available forms of attendance
Mandatory (theoretical and practical lectures)
6. Number of study hours (total) / Number of units (total)
numbers of theoretical hours (2) working hours(0) Total hours (2) Total Units (2)
7. Name of the course administrator (if more than one name is mentioned)
The Name: Email:
8. Course objectives

	Course objectives

9. Teaching and learning strategies	
Lecture Method Student groups (team work) Tasks - Homework for Students	strategy

10. Course structure

Evaluation method	Learning method	Name of unit or topic	Required learning outcomes	the hours	Week
questions and answers	Lecture and Discussion	•Basic concepts of data communication •Components of data communication - Data representation - Data stream - Types of connections - Protocol - Standards	cognitive - emotional	2	The First – 3rd
questions	Lecture and	• Networks	cognitive	2	4th

and exercises	Discussion				
questions and exercises	Lecture and Discussion	• Data and Signals - Analog and Digital Data - Analog and Digital Signals	cognitive	2	5th- 8th
questions and exercises	Lecture and Discussion	• Digital Signals and Transfer Rate - Digital Signal - Definition of Transfer Rate - Transmission of Digital Signals - Transmission Disadvantages - Maximum Transfer Rate	cognitive	2	9th – 11th
questions and exercises	Lecture and Discussion	• Digital Transmission - Definitions and Basic Concepts - Digital Signal Properties - Line Coding - Performance Improvement Techniques - Analog Switching - Transmission Modes	cognitive	2	12th – Fifteenth

11. Course Evaluation

- • Direct questions and daily exams.
- Motivating students and encouraging them to participate actively.
- Discussion in lectures.
- Extra activities.
- Midterm exams and actual attendance.

12. Learning and teaching resources

	Required Course Books (Methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports…)