Course description form

1. Course name
Operating Systems
2. Course code
CMNT301
3. Semester/year
1st Semester / 2024 - 2025
4. Date this description was prepared
September 2024
5. Available attendance forms
In-person lectures
6. Number of study hours (total)/number of units (total)
60 (4 hours/week) /3 units
7. Name of the course administrator (if more than one name is mentioned)
Dr. Anas Al-dabbagh
8. Course objectives
By the end of this course, students will: 1. Understand the core functions and structures of operating systems. 2. Analyze process management, CPU scheduling, and synchronization. 3. Evaluate deadlock conditions and resolution strategies. 4. Apply theoretical concepts through practical labs (e.g., shell scripting, process simulation). 5. Compare different OS architectures (monolithic, microkernel, layered).
9. Teaching and learning strategies
● **Lectures:** Interactive sessions with slides and live demos. ● **Labs:** Hands-on exercises (e.g., implementing scheduling algorithms in Python). ● **Case Studies:** Real-world examples (e.g., Chrome's multiprocess architecture). ● **Assessments:** Quizzes, assignments, and a final project.
10. Course structure

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
first	**2 Theoretical 3 Practical**	Define OS roles and components.	Introduction to OS	Lecture + Q&A	Quiz 1
second	**2 Theoretical 3 Practical**	Explain OS services (UI, file systems).	OS Services & Interfaces	Demo (CLI/GUI)	Lab Report 1
third	**2 Theoretical 3 Practical**	Describe process states and PCB	Process Concept	Diagramming PCBs	Assignment
Fourth	**2 Theoretical 3 Practical**	Compare schedulers (short/long-term)	Process Scheduling	Simulation (FCFS/SJF)	Quiz 2
Fifth	**2 Theoretical 3 Practical**	Analyze preemptive vs. non-preemptive scheduling.	CPU Scheduling Algorithms	Case Study (RR vs. Priority)	Lab Report 2
Sixth	**2 Theoretical 3 Practical**	Implement inter-process communication.	IPC (Shared Memory/Messages)	Coding Exercise (C/Python)	Assignment 2
Seventh	**2 Theoretical 3 Practical**	Diagnose deadlock conditions.	Deadlock (Conditions/Graphs)	Group Discussion	Quiz 3
Eighth	**2 Theoretical 3 Practical**	Evaluate deadlock resolution methods.	Deadlock Handling	Role-Play (Bridge Problem)	Lab Report 3
Ninth	**2 Theoretical 3 Practical**	**Midterm Exam**	Review Weeks 1–8	Exam	Midterm (15%)

tenth	**2 Theoretical 3 Practical**	Contrast OS structures (monolithic/micro kernel).	OS Structure	Debate (Pros/Cons)	Assignment 3
eleventh	**2 Theoretical 3 Practical**	Explain memory hierarchy and caching.	Storage Management	Diagram Storage Layers	Quiz 4
twelfth	**2 Theoretical 3 Practical**	Analyze multiprocessor systems.	Multiprocessing & Clustering	Case Study (Google's Cluster)	Lab Report 4
thirteenth	**2 Theoretical 3 Practical**	Explore virtualization and cloud OS.	Advanced Topics (Virtualization)	Guest Lecture	Assignment 4
fourteenth	**2 Theoretical 3 Practical**	**Review course material.**	Recap & Project Work	Group Presentations	Project Draft
fifteenth	**2 Theoretical 3 Practical**	**Final Exam/Project Submission**	Comprehensive Assessment	Exam + Demo	Final (30%)

11. Course evaluation

T	**Component**	**Weight**	**Week**	
1	Quizzes (4)	10%	Weeks 1, 4, 7, 11	
2	Assignments (4)	10%	Weeks 3, 6, 10, 13	
3	Lab Reports (4)	10%	Weeks 2, 5, 8, 12	
4	Midterm Exam	20%	Week 9	
5	Final Exam	50%	Week 15	

12. Learning and teaching resources	
Required textbooks (methodology, if any)	**Textbook:** *Operating System Concepts* (Silberschatz, Galvin, Gagne).
Main references (sources)	Lecture slides (provided weekly). Research papers on OS architectures (e.g., microkernels vs. monolithic).
Recommended supporting books and references (scientific journals, reports....)	VirtualBox (for OS labs), Python/C for simulations.
Electronic references, Internet sites	MIT OpenCourseWare (OS lectures), GeeksforGeeks (algorithms).

Lecturer
Theoretical subject teacher

Dr. Anas Al-dabbagh

Lecturer Assist.
practical subject teacher

Course description form

1. Course name
Coding and Information Theory
2. Course code
CMNT302
3. Semester/year
1st Semester / 2024-2025
4. Date this description was prepared
10/06/2024
5. Available attendance forms
Theoretical and Practical
6. Number of study hours (total)/number of units (total)
30 hours / 2 units
7. Name of the course administrator (if more than one name is mentioned)
Dr. Riyadth Zaghlol
8. Course objectives
- Understand entropy, mutual information, and data redundancy. - Apply source coding techniques such as Huffman and arithmetic coding. - Analyze channel capacity and error control coding. - Design encoding/decoding algorithms for linear and convolutional codes. - Simulate noise channels and compute their performance metrics. - Evaluate real-world use cases of coding theory in storage and communication systems. - Apply Shannon's theorems to practical scenarios. - Utilize MATLAB or Python to implement and assess coding systems.
9. Teaching and learning strategies
- Lectures and mathematical derivations. - Hands-on labs for coding algorithm implementation. - Weekly assignments and guided problem-solving. - Midterm and final exams to assess comprehension. - Projects focused on real-life data transmission scenarios. - Simulation-based performance testing.

10. Course structure

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
first	2 Theoretical	Define entropy, information, redundancy	Introduction to Information Theory	Lecture	Quiz
second	2 Theoretical	Apply lossless compression	Huffman and Arithmetic Coding	Lecture	Assignment
third	2 Theoretical	Understand limits of compression	Shannon's First Theorem	Theory + Problem Solving	Test
Fourth	2 Theoretical	Differentiate between noisy/noiseless channels	Channel Models	Lecture + Examples	Quiz
Fifth	2 Theoretical	Calculate channel performance	Channel Capacity	Problem Solving	Midterm
Sixth	2 Theoretical	Implement simple error-detection methods	Error Detection: Parity, CRC	Lecture	Short Test
Seventh	2 Theoretical	Understand and use G and H matrices	Linear Block Codes	Lecture	Assignment
Eighth	2 Theoretical	Design single-bit error correction	Hamming Codes	Practice + Coding	Lab Evaluation
Ninth	2 Theoretical	Analyze code polynomials and CRC	BCH and Cyclic Codes	Lecture + Code	Test
tenth	2 Theoretical	Apply Viterbi decoding	Convolutional Codes	Simulation + Tools	Quiz
eleventh	2 Theoretical	Theoretical bounds of noisy transmission	Shannon's Second Theorem	Lecture	Assignment
twelfth	2 Theoretical	Analyze BER, FER, noise models	Performance Metrics	Simulation	Project

thirteenth	2 Theoretical	Discuss real-world implications	Application in Storage and Networks	Case Study	Presentation
fourteenth	2 Theoretical	Integrate course concepts	Review and Practical Exercises	Workshop	Practice Exam
fifteenth	2 Theoretical	Final assessment	Final Exam & Project Review	Exam + Presentation	Final Exam

11. Course evaluation

T	Calendar methods	Calendar date (week)	Huffman and Arithmetic Coding	Huffman and Arithmetic Coding
2	Short Test 1	Week 4	10	5%
3	Midterm Exam	Week 9	20	20%
4	Short Test 2	Week 12	10	5%
6	Final Exam	Final Exam Week	60	60%
	total		100	100%

12. Learning and teaching resources

Required textbooks (methodology, if any)	
Main references (sources)	• Network Programming in C – Richard Stevens • Python Network Programming Cookbook – Dr. M. Nawaz
Recommended supporting books and references (scientific journals, reports....)	• Unix Network Programming – W. Richard Stevens • RFC documentation for protocols
Electronic references, Internet sites	• Online tutorials (GeeksforGeeks, RealPython, etc.)

	• Socket API references from official docs

Lecturer
Theoretical subject teacher

Lecturer Assist.
practical subject teacher

Course description form

1. Course name
Artificial Intelligence (**AI**)
2. Course code
CMNT303
3. Semester/year
First semester / 2024-2025
4. Date this description was prepared
Aug. 2024
5. Available attendance forms
In class
6. Number of study hours (total)/number of units (total)
60 hours (30 Theoretical + 30 Practical) / 3 Units
7. Name of the course administrator (if more than one name is mentioned)
Ansam Nazar Younis
8. Course objectives

• Introduce students to the concept of artificial intelligence and its most important programming languages. It also aims to teach students about state space search methods and solving many problems addressed by this type of search. • Additionally, it will teach students about blind search methods or what are called heuristic search methods. Students will also learn about approximation search techniques, their algorithm types, and how to solve problems using these types of search methods. • The course also aims to introduce students to knowledge representation methods and their types, which include logical representation such as propositional logic and predicate logic. • It will also teach students about network representation of knowledge, which includes knowledge representation through semantic networks, conceptual mapping, or framework methods. The course also aims to teach students the general concept of expert systems, how to build them, their architecture, and their classifications. • Additionally, students will learn about the general concept of artificial neural networks, how to build them, types of	

learning within them, and their characteristics.	

9. Teaching and learning strategies

- Theoretical lectures with live coding demonstrations.
- Solving problems using blind search methods and heuristic search methods. Representing knowledge in various ways, studying expert systems and artificial neural networks.

10. Course structure

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
first	**2 Theoretical 3Practical**	Introduction to Artificial Intelligence	Introduction to Artificial Intelligence. Languages and Environments for AI. AI Application Areas. Characteristics of Artificial Intelligence Data, Information, and Knowledge.	Learning method	Evaluation method
second	**2 Theoretical 3Practical**	Search Methods	Search Methods. Structures for state space. State Space represented of problems. State Space Search.	Lecture + Demo	Class discussion
third	**2 Theoretical 3Practical**	State Space Search Problem	Traveling Salesperson Problem. Water Jug Problem. Coins Problem. sliding-tile puzzle problem.	Lecture + Examples	In-class quiz
Fourth	**2 Theoretical 3Practical**	Systematic Search (Blind search)	Blind search. Depth-First Search. Depth first search (DFS)method. Depth first search(DFS) algorithm.	Lecture + Exercises	Practical assignment

			Depth first search(DFS) problems. Advantages of DFS disadvantages of DFS.		
Fifth	**2 Theoretical 3Practical**	Systematic Search (Blind search)	Breadth first search (BFS)method. Breadth first search(BFS) algorithm. Breadth first search(BFS) problems. Advantages of BFS disadvantages of BFS.	Lecture + Lab	Homework
Sixth	**2 Theoretical 3Practical**	Systematic Search (Blind search)	Hybrid first search (HFS). Hybrid first search (HFS) method. Hybrid first search (HFS) algorithm. Hybrid first search (HFS) problems. Advantages of HFS disadvantages of HFS.	Lecture + Coding Lab	Quiz
Seventh	**2 Theoretical 3Practical**	Heuristic Search	Heuristic Search Techniques. Heuristic search methods. Generate and test. Hill climbing search. Hill climbing search Algorithm. Problems with hill climbing. To solving problems for hill climbing search. Best first search. A* algorithm	Lecture + Practice	Assignment
Eighth	**2 Theoretical 3Practical**	Knowledge Representation	Knowledge Representation. Logic Representation. Propositional Logic. Predicate Logic. Clauses. Horn Clause. Unification.	Lecture + Lab	Quiz
Ninth	**2 Theoretical 3Practical**	Propositional Logic And Predicate Logic	Some examples of knowledge representation. Clause form. Convert to clause form.	Lecture + Exercises	Practical task

tenth	**2 Theoretical 3Practical**	Network Representation	Network Representation. Semantic Network. Examples of Semantic Network. Abstract objects.	Discussion + Review	Midterm exam
eleventh	**2 Theoretical 3Practical**	Network Representation, Conceptual Graph	Conceptual Graph. Operations on Conceptual Graphs. Negation of conceptual graph. Representing propositions by conceptual graph.	Written + Practical	Midterm
twelfth	**2 Theoretical 3Practical**	Network Representation , Frames	Frames. Some examples to Network Representation by Frames. Advantages and disadvantages of knowledge representation methods	Lecture + Lab	Homework
thirteenth	**2 Theoretical 3Practical**	Expert System	Expert System. What are Expert Systems(ES). Architecture of Expert System. Expert System classes.	Lecture + Examples	Quiz
fourteenth	**2 Theoretical 3Practical**	Machine Learning: Artificial Neural Networks	Artificial Neural Networks (ANNs). Introduction for ANNs. Biological Neural Network. Artificial Neuron. Learning in Neural Networks. Properties of A.N.N. Important A.N.N. parameter.	Lecture + Lab	Assignment
fifteenth	**2 Theoretical 3Practical**	Machine Learning: **Fuzzy Logic**	Why fuzzy? Membership function FL Architecture Building a fuzzy expert system	Lab-based	Report
11. Course evaluation					

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15	7 theoretical + 6 practical	13%
2	short test (1) Who	week (3)	4 theoretical + 2 practical	6%
3	Midterm test (theoretical and practical)	week (9)	10 theoretical + 5 practical	15%
4	short test (1) Who	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	Practical exam week	10	10%
6	Final theoretical test	Theory exam week	50	50%
	total		100	100%

12. Learning and teaching resources

Required textbooks (methodology, if any)	
Main references (sources)	1. AI Super Power(Kai- Fu Lee, 2018). 2. Artificial Intelligence Aguide for Thinking Humans(Melanie Matchell, 2019). 3. Fundamentals of Artificial Intelligence Book by K. R. Chowdhary, 2020
Recommended supporting books and references (scientific journals, reports....)	• Introduction To Machine Learning An Early Draft Of A Proposed Textbook Nils J. Nilsson
Electronic references, Internet sites	geeksforgeeks.org/introduction-machine-learning/

Lecturer
Theoretical subject teacher

Lecturer Assist.
practical subject teacher

Course Description Form

1. Course name
Distributed Database
2. Course code
CMNT304
3. Semester/year
First course / 2024-2025
4. Date this description was prepared
10 / 6/ 2024
5. Available attendance forms
Face to face
6. Number of study hours (total)/number of units (total)
60 hours / 3 units
7. Name of the course administrator (if more than one name is mentioned)
Name: Assis. Prof. Dr. Ammar Thaher Yaseen / ammarthaher@uomosul.edu.iq Name: Assis. Lec. Zaid Daud
8. Course objectives
1. To develop data analyzing skills. 2. To understand distributed database principles and its application fields. 3. This course deals with the basic concept of distributed database systems. 4. This is the basic subject for all distributed database systems and their applications. 5. To understand distributed database management system and distributed database models. 6. To perform one of a distributed database system project.
9. Teaching and learning strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive project and by considering type of simple experiments involving some quizzes activities that are interesting to the students.

10. Course structure

Week	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
First	2 Theoretical 3Practical	Over all database definitions and application characteristics	General definitions of database and its characteristics.	White Board, Data Show	Oral Questions, Homework
Second	2 Theoretical 3Practical	The database transaction definition and characteristics	The roles of database transaction management systems.	White Board, Data Show	Homework, Quiz
Third	2 Theoretical 3Practical	AICD properties	ACID characteristic in database systems and they applied	White Board, Data Show	Oral Questions, Homework
Fourth	2 Theoretical 3Practical	Transaction scheduling	General ideas of scheduling in database	White Board, Data Show	Homework, Quiz
Fifth	2 Theoretical 3Practical	Relational Algebra	Conceptual idea of relational algebra	White Board, Data Show	Oral Questions, Homework
Sixth	2 Theoretical 3Practical	Computer Network architecture and database system.	Network architecture and database system.	White Board, Data Show	Homework, Quiz
Seventh	2 Theoretical 3Practical	Mid-term Exam.	Mid-term Exam.	Mid-term Exam.	Mid-term Exam.
Eighth	2 Theoretical 3Practical	The distributed database definition, advantages, and disadvantages	DDB motivations	White Board, Data Show	Homework, Quiz
Ninth	2 Theoretical 3Practical	Over all distributed database architectures properties	Explain the main DDB structure	White Board, Data Show	Oral Questions, Homework
Tenth	2 Theoretical 3Practical	Explain data replication in distributed database	Replication definition	White Board, Data Show	Homework, Quiz
Eleventh	2 Theoretical	Location	The main advantages of	White Board,	Oral Questions,

	3Practical	transparency	DDB	Data Show	Homework
Twelfth	2 Theoretical 3Practical	Concurrency control model in DDB	Synchronous and asynchronous applications	White Board, Data Show	Oral Questions, Homework
Thirteenth	2 Theoretical 3Practical	Explain DDBMS components	DDBMS properties	White Board, Data Show	Homework, Quiz
Fourteenth	2 Theoretical 3Practical	DDBMS services	The main advantages of DDBMS	White Board, Data Show	Oral Questions, Homework
Fifteenth	2 Theoretical 3Practical	DDBMS remote access approach	Explain the remote and direct access	White Board, Data Show	Homework, Quiz

11. Course evaluation

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15	7 theoretical + 6 practical	13%
2	short test (1) Who	week (3)	4 theoretical + 2 practical	6%
3	Midterm test (theoretical and practical)	week (9)	10 theoretical + 5 practical	15%
4	short test (1) Who	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	Practical exam week	10	10%
6	Final theoretical test	Theory exam week	50	50%
	Total		100	100%

12. Learning and teaching resources

Required textbooks (methodology, if any)	Modern Database Management Systems, Fred R. McFadden, 10th ed, Addison –Wesly, 2015
Main references (sources)	Distributed Database system concepts, by Tamur Azueo, 2th ed, McGraw-Hill, 2020.

Recommended supporting books and references (scientific journals, reports....)	
Electronic references, Internet sites	https://hevodata.com/learn/database-systems/

Lecturer
Theoretical subject teacher
Assis. Prof. Dr. Ammar Thaher Yaseen Yaseen

Lecturer Assist.
Practical subject teacher
Assis. Prof. Dr. Ammar Thaher

Assis. Lec. Zaid Daud

Course description form

1. Course name
Network Programming I
2. Course code
CMNT305
3. Semester/year
1st Semester / 2024-2025
4. Date this description was prepared
10/06/2024
5. Available attendance forms
Theoretical and Practical
6. Number of study hours (total)/number of units (total)
60/3
7. Name of the course administrator (if more than one name is mentioned)
Dr. Ayad Hussain
8. Course objectives
- Understand the basics of socket programming and communication models. - Learn client-server architecture and implement real-time communication. - Explore TCP/UDP protocols through practical experiments. - Develop skills in error handling, connection management, and protocol simulation. - Study HTTP, FTP, and other common network services and their implementation. - Use multithreading to manage concurrent network operations. - Introduce network security concepts in programming environments. - Build foundational network tools (chat, file transfer, etc.) using Python or C++.
9. Teaching and learning strategies
- Interactive lectures and coding demonstrations - Hands-on socket programming labs in Python/C++ - Project-based assignments with real use cases - Team-based protocol simulation and tool development - Quizzes and coding tasks for assessment - Online debugging forums and peer code review - Midterm and final evaluations combining theory and practical work

10. Course structure

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
first	2 Theoretical 2Practical	Understand OSI/TCP-IP and socket basics	Introduction to Networking and Sockets	Lecture + Lab	Quiz
second	2 Theoretical 2Practical	Use sockets for both TCP and UDP	TCP vs UDP Programming	Lecture + Lab	Assignment
third	2 Theoretical 2Practical	Implement basic client-server chat app	Client-Server Models	Lab	Test
Fourth	2 Theoretical 2Practical	Manage concurrent client handling	Multithreading in Network Applications	Simulation	Lab Evaluation
Fifth	2 Theoretical 2Practical	Implement handshake protocols	Reliable Communication & Acknowledgments	Lab + Lecture	Midterm
Sixth	2 Theoretical 2Practical	Detect and recover from network failures	Error Handling in Network Code	Practice	Quiz
Seventh	2 Theoretical 3Practical	Create a minimal HTTP server	HTTP and Simple Web Servers	Project	Assignment
Eighth	2 Theoretical 2Practical	Code simple FTP model	File Transfer Protocols	Lab + Task	Short Test
Ninth	2 Theoretical 2Practical	Implement basic DNS resolver	Name Resolution and DNS	Case Study	Midterm

tenth	2 Theoretical 2Practical	Use libraries to encrypt communication	Introduction to Secure Sockets (SSL/TLS)	Lab	Assignment
eleventh	2 Theoretical 2Practical	Program UDP broadcast/multicast	Broadcast and Multicast	Simulation	Quiz
twelfth	2 Theoretical 2Practical	Develop and test protocol logic	Custom Protocol Design	Workshop	Project
thirteenth	2 Theoretical 2Practical	Measure network latency & trace issues	Performance and Debugging	Lab	Test
fourteenth	2 Theoretical 2ractical	Assemble a complete network tool	Final Project Development	Project	Presentation
fifteenth	2 Theoretical 2Practical	Comprehensive review and test	Course Summary and Exam	Workshop	Final Exam

11. Course evaluation

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Lab Reports	Weekly	10	10%
2	Short Test 1	Week 4	5	5%
3	Midterm Exam	Week 9	20	20%
4	Short Test 2	Week 12	5	5%
5	Practical Test	Practical Exam Week	10	10%
6	Final Exam	Final Exam Week	50	50%
	total		100	100%

12. Learning and teaching resources

Required textbooks (methodology, if any)	
Main references (sources)	• Network Programming in C – Richard Stevens • Python Network Programming Cookbook – Dr. M. Nawaz
Recommended supporting books and references (scientific journals, reports....)	• Unix Network Programming – W. Richard Stevens • RFC documentation for protocols
Electronic references, Internet sites	• Online tutorials (GeeksforGeeks, RealPython, etc.) • Socket API references from official docs

Lecturer
Theoretical subject teacher

Lecturer Assist.
practical subject teacher

Course description form

1. Course name	
Network Protocols -2-	
2. Course code	
CMNT306	
3. Semester/year	
First semester / 2024-2025	
4. Date this description was prepared	
1/9/2024	
5. Available attendance forms	
In Class	
6. Number of study hours (total)/number of units (total)	
60 / 3	
7. Name of the course administrator (if more than one name is mentioned)	
Dr.Omar Abdulmunem Ibrahim Aldabbagh	
8. Course objectives	
- Deepen understanding of advanced network protocols and their applications. - Examine protocols in the transport and application layers. - Gain expertise in network protocol design, implementation, and analysis.	
9. Teaching and learning strategies	
- Advanced theoretical lectures and discussions. - Lab sessions with real network simulations and advanced packet tracing. - Research assignments and problem-based learning. - Interactive quizzes and collaborative group tasks.	
10. Course structure	

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
first	**2 Theoretical 3Practical**	Review of TCP/IP and OSI models	Advanced Concepts Review	Lecture + Discussion	Class participation
second	**2 Theoretical 3Practical**	Dynamic Routing Protocols	Advanced Routing	Lecture + Simulation	Quiz
third	**2 Theoretical 3Practical**	RIP-1-	RIP routing protocol	Lecture + Lab	Assignment
Fourth	**2 Theoretical 3Practical**	RIP-2-	RIPv2 routing protocol	Lecture + Wireshark	Homework

Fifth	**2 Theoretical 3Practical**	OSPF-1-	Open Shortest Path First routing protocol	Lecture + Exercises	Quiz/Test
Sixth	**2 Theoretical 3Practical**	OSPF-2-	Open Shortest Path First routing protocol	Lecture + Lab	Assignment
Seventh	**2 Theoretical 3Practical**	OSPF-3-	Open Shortest Path First routing protocol	Lecture + Wireshark	Quiz
Eighth	**2 Theoretical 3Practical**	Ipv4 Protocol+IP Fragmentaion	Internet Protocol header and IP packet fragmentation	Lab-based	Report

Ninth	**2 Theoretical 3Practical**	IP options + IP Checksum	IP header options and computing the header checksum	Discussion + Practice	Midterm exam
tenth	**2 Theoretical 3Practical**	Mid-term Examination	Exam	Written + Practical	Midterm
eleventh	**2 Theoretical 3Practical**	Ipv6-1-	Internet Protocol version 6	Lecture + Examples	Homework
twelfth	**2 Theoretical 3Practical**	Ipv6-2-	Internet Protocol version 6	Lecture + Demo	Quiz
thirteenth	**2 Theoretical 3Practical**	NAT	Network Address Translation	Lecture + Case study	Assignment

fourteenth	**2 Theoretical 3Practical**	**VPN**	Virtual Private Network	Lab + Discussion	Report
fifteenth	**2 Theoretical 3Practical**	Review + presentations	Review	Presentation + Feedback	Participation

11. Course evaluation

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15	7 theoretical + 6 practical	13%
2	short test (1) Who	week (3)	4 theoretical + 2 practical	6%
3	Midterm test (theoretical and practical)	week (9)	10 theoretical + 5 practical	15%
4	short test (1) Who	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	Practical exam week	10	10%
6	Final theoretical test	Theory exam week	50	50%
	Total		100	100%

12. Learning and teaching resources	
Required textbooks (methodology, if any)	Required textbooks: TCP/IP Protocol Suite by Behrouz A. Forouzan
Main references (sources)	* Cisco Networking Academy materials * Computer Networking: A Top-Down Approach by Kurose and Ross
Recommended supporting books and references (scientific journals, reports....)	* - Network+ Guide to Networks * - Internet resources and protocol documentation (RFCs)
Electronic references, Internet sites	* - https://www.cisco.com * - https://www.geeksforgeeks.org/computer-network-tutorials/ * - https://www.networklessons.com

Lecturer
Theoretical subject teacher
Dr.Omar Abdulmunem Aldabbagh

Lecturer Assist.
practical subject teacher
Dr.Omar Abdulmunem Aldabbagh

Course description form

1. Course name
Wireless and Mobile Computing
2. Course code
CMNT307
3. Semester/year
1st Semester / 2024-2023
4. Date this description was prepared
August 25/2023
5. Available attendance forms
In-person / Online (as per university policy)
6. Number of study hours (total)/number of units (total)
60 hours / 3 units
7. Name of the course administrator (if more than one name is mentioned)
Mohammed Zaki Hasan
8. Course objectives

Introduce the fundamentals of wireless communication and mobile computing. - Explore architectures, protocols, and technologies used in mobile and wireless networks. - Understand the design and operation of mobile systems including 3G/4G/5G networks, Wi-Fi, and Bluetooth. - Examine issues related to mobility management, handoff strategies, and mobile IP. - Analyze the performance, limitations, and security concerns of mobile computing environments. - Apply theoretical knowledge in practical lab settings to simulate and evaluate wireless.	

9. Teaching and learning strategies

- Lectures supported by multimedia presentations.
- Hands-on laboratory experiments and simulations.
- Group discussions and case studies on real-world wireless systems.
- Assignments and project-based learning for reinforcing concepts.
- Quizzes, midterm, and final exams for evaluation and feedback.

10. Course structure

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
First	2 Theoretical / 3 Practical	Understand the fundamentals of wireless communication	Introduction to Wireless Communication & Mobile Computing	Lecture / Lab Demonstration	Quiz / Participation
Second	2 Theoretical / 3 Practical	Explain radio wave propagation and transmission basics	Wireless Transmission Principles	Lecture / Simulation	Lab Report

Third	2 Theoretical / 3 Practical	Describe the architecture and protocols of wireless networks	Wireless Network Types and Topologies (LAN, MAN, WAN, PAN)	Lecture / Group Discussion	Short Test 1
Fourth	2 Theoretical / 3 Practical	Analyze WLAN components and standards (802.11x)	Wireless LAN (Wi-Fi) and IEEE 802.11 Standards	Lecture / Lab	Assignment
Fifth	2 Theoretical / 3 Practical	Explain Bluetooth and related short-range communication technologies	WPAN: Bluetooth, ZigBee, NFC	Lecture / Hands-on Lab	Quiz
Sixth	2 Theoretical / 3 Practical	Understand cellular system structure and mobile communication	Cellular Networks (2G/3G/4G/5G)	Lecture / Case Study	Lab Report

Seventh	2 Theoretical / 3 Practical	Evaluate MAC layer techniques in mobile environments	Medium Access Control (MAC) in Wireless Networks	Lecture / Simulation	Assignment
Eighth	2 Theoretical / 3 Practical	Identify techniques for mobility and handoff management	Mobility Management and Handoff Techniques	Lecture / Presentation	Quiz
Ninth	2 Theoretical / 3 Practical	Perform practical and theoretical review of mobile systems	Midterm Review & Examination	Lecture / Practical Exam	Midterm Exam (Theory + Lab)

Tenth	2 Theoretical / 3 Practical	Define and use mobile IP and routing protocols in mobile networks	Mobile IP and Routing Protocols (AODV, DSR, etc.)	Lecture / Coding Lab	Lab Report
Eleventh	2 Theoretical / 3 Practical	Examine data management techniques in mobile environments	Data Dissemination and Management in Mobile Systems	Lecture / Group Work	Assignment
Twelfth	2 Theoretical / 3 Practical	Assess security issues in wireless/mobile environments	Security in Wireless and Mobile Computing	Lecture / Security Simulation	Short Test 2
Thirteenth	2 Theoretical / 3 Practical	Explore recent trends in mobile application development	Mobile Application Platforms and Tools	Lecture / Android Studio Lab	Project Work
Fourteenth	2 Theoretical / 3 Practical	Discuss case studies on smart devices, IoT, and ubiquitous computing	Mobile Devices, IoT, and Ubiquitous Computing	Seminar / Lab Demonstration	Presentation

Fifteenth	2 Theoretical / 3 Practical	Review full course and prepare for final exams	Final Review and Project Presentations	Lecture / Project Presentation	Final Practical & Theoretical

11. Course evaluation				
T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15	7 theoretical + 6 practical	13%
2	short test (1) Who	week (3)	4 theoretical + 2 practical	6%
3	Midterm test (theoretical and practical)	week (9)	10 theoretical + 5 practical	15%
4	short test (1) Who	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	Practical exam week	10	10%
6	Final theoretical test	Theory exam week	50	50%
	total		100	100%

12. Learning and teaching resources	
Required textbooks (methodology, if any)	
Main references (sources)	
Recommended supporting books and references (scientific journals, reports....)	
Electronic references, Internet sites	

Lecturer **Lecturer Assist.**

Theoretical subject teacher **practical subject teacher**

Course description form

1. Course name
Network Modeling and Simulation
2. Course code
CMNT308
3. Semester/year
2nd Semester / 2024-2023
4. Date this description was prepared
August 25/2024
5. Available attendance forms
In-person / Online (as per university policy)
6. Number of study hours (total)/number of units (total)
60 hours / 3 units
7. Name of the course administrator (if more than one name is mentioned)
Mohammed Zaki Hasan
8. Course objectives

- Understand the fundamentals of network modeling and performance evaluation. - Explore simulation techniques for wired and wireless networks. - Gain practical experience with network simulators such as NS2/NS3 and OMNeT++. - Analyze different traffic models and protocol behaviors under simulation. - Develop models to study delay, throughput, congestion, and scalability. - Apply simulations to design and optimize network systems.	

9. Teaching and learning strategies

- Interactive lectures and whiteboard-based teaching. - Use of simulation tools in laboratory sessions. - Project-based learning for solving real-world networking problems. - Assignments and weekly tasks to reinforce theoretical knowledge. - Continuous assessment through practical experiments and exams.	

10. Course structure

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
First	2 Theoretical / 3 Practical	Understand network modeling and simulation fundamentals	Introduction to Network Modeling & Simulation	Lecture / Tool Setup	Quiz / Participation
Second	2 Theoretical / 3 Practical	Define network performance metrics	Performance Metrics: Delay, Throughput, Packet Loss	Lecture / Examples	Lab Report
Third	2 Theoretical / 3 Practical	Implement basic simulation using NS2/NS3	Introduction to NS2/NS3 Environment	Lecture / Coding Lab	Short Test 1

Fourth	2 Theoretical / 3 Practical	Model and simulate wired networks	Wired Network Modeling	Lecture / Simulation	Assignment
Fifth	2 Theoretical / 3 Practical	Understand network traffic models	Traffic Modeling: CBR, VBR, Exponential	Lecture / Practical Exercise	Quiz
Sixth	2 Theoretical / 3 Practical	Apply queueing theory in simulations	Queueing Models and Their Impact on Network Performance	Lecture / Case Study	Lab Report
Seventh	2 Theoretical / 3 Practical	Simulate wireless network scenarios	Wireless Network Simulation	Lecture / NS Simulation	Assignment

Eighth	2 Theoretical / 3 Practical	Evaluate protocol behaviors under different traffic	Simulation of Routing and MAC Protocols	Lecture / Coding Lab	Quiz
Ninth	2 Theoretical / 3 Practical	Review and test cumulative knowledge	Midterm Exam and Review	Lecture / Exam	Midterm Exam (Theory + Lab)
Tenth	2 Theoretical / 3 Practical	Model error and loss scenarios	Error Models in Simulation	Lecture / Simulation	Lab Report
Eleventh	2 Theoretical / 3 Practical	Model mobility and dynamic topologies	Mobility Models and Mobile Node Simulation	Lecture / Tool Practice	Assignment

Twelfth	2 Theoretical / 3 Practical	Optimize network models for performance	Network Design and Optimization	Lecture / Design Lab	Short Test 2
Thirteenth	2 Theoretical / 3 Practical	Perform project simulations using NS/OMNeT++	Project Development and Implementation	Project Work / Mentoring	Project Evaluation
Fourteenth	2 Theoretical / 3 Practical	Present simulation projects and findings	Project Presentation & Feedback	Seminar / Peer Review	Presentation
Fifteenth	2 Theoretical / 3 Practical	Conduct final revision and evaluation	Final Review and Simulation Testing	Lecture / Final Exam	Final Practical & Theoretical

11. Course evaluation

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15	7 theoretical + 6 practical	13%

2	short test (1) Who	week (3)	4 theoretical + 2 practical	6%
3	Midterm test (theoretical and practical)	week (9)	10 theoretical + 5 practical	15%
4	short test (1) Who	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	Practical exam week	10	10%
6	Final theoretical test	Theory exam week	50	50%
	total		100	100%

12. Learning and teaching resources	
Required textbooks (methodology, if any)	
Main references (sources)	
Recommended supporting books and references (scientific journals, reports....)	
Electronic references, Internet sites	

Lecturer
Theoretical subject teacher

Lecturer Assist.
practical subject teacher

Course description form

1. Course name
Network Operating System
2. Course code
CMNT309
3. Semester/year
2024/2025
4. Date this description was prepared
Jan. 1, 2025
5. Available attendance forms
In-class + Lab
6. Number of study hours (total)/number of units (total)
60 hours / 3 units
7.Name of the course administrator (if more than one name is mentioned)
Tarfa Yaseen Hamed
8. Course objectives

1. **Understand the fundamental concepts and architecture** of network operating systems and differentiate them from traditional operating systems.
2. **Describe and evaluate the key functions and components** of a NOS, including user management, resource sharing, and communication mechanisms.
3. **Manage and administer network resources**, such as files, printers, and devices, in a multi-user and distributed environment.
4. **Configure and utilize remote access features** of NOS to enable secure access and control over networked systems.
5. **Explain and implement the file system hierarchy** specific to network operating systems for efficient data management and access control.
6. **Understand the role and configuration of DNS** within a NOS for name resolution and distributed network communication.
7. **Set up and manage print servers** to allow shared access to printing resources across a network.
8. **Evaluate and implement security measures** in a NOS, including user authentication, authorization, and access control mechanisms.
9. **Analyze and configure process and task scheduling mechanisms** to optimize performance and resource utilization in network environments.
10. **Explore the integration of cloud computing technologies** with network operating systems,

emphasizing virtualization, scalability, and service-based models.

9. Teaching and learning strategies

1. **Lectures with Real-World Scenarios**

- Deliver conceptual and theoretical content through lectures enriched with case studies and real-life examples from enterprise NOS implementations (e.g., Windows Server, Linux-based systems).

2. **Hands-On Lab Sessions**

- Provide guided practical exercises in a virtual or physical lab environment using NOS platforms (e.g., Windows Server, Ubuntu Server, Red Hat).
- Tasks include setting up DNS, file sharing, user management, remote access, and printer server configurations.

3. **Problem-Based Learning (PBL)**

- Use network administration challenges to encourage students to research, analyze, and propose solutions using NOS features.

4. **Demonstrations and Simulations**

- Use virtual machines or simulators (e.g., VirtualBox, VMware) to demonstrate installation, configuration, and troubleshooting of NOS services.

5. **Group Projects and Peer Collaboration**

- Assign group-based mini-projects such as designing a secure network with shared resources and remote access control, fostering teamwork and practical application.

6. **Case Study Analysis**

- Analyze real-world NOS deployments in organizations (e.g., schools, hospitals, or enterprises) to connect theory with practice.

7. **Flipped Classroom Approach**

- Assign preparatory reading or video lectures before class and use in-class time for discussions, Q&A, and problem-solving activities.

8. **Quizzes and Formative Assessments**

- Conduct regular quizzes and low-stakes tests to assess understanding of topics like

scheduling, DNS, and file systems.

9. **Guest Lectures / Industry Talks**

- Invite IT professionals or system administrators to share insights on practical NOS deployment and cloud integration.

10. Course structure

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
first	**2 Theoretical 2 Practical**	1. **Define a Network Operating System (NOS)** and distinguish it from traditional single-user operating systems. 2. **Explain the role and importance of NOS** in managing and coordinating resources in a networked computing environment. 3. **Identify the main** features and components of a typical NOS (e.g., user management, resource sharing, remote access). 4. **Describe different types** of NOS (e.g., Windows Server, Linux-based NOS like Ubuntu Server or Red Hat Enterprise Linux) and their typical use cases. 5. **Compare peer-to-peer and client-server** network models in the context of NOS	Introduction to Network Operating System	Traditional slides and Lab	Quiz and lab test

		functionalities. 6. **Discuss the historical** development and evolution of NOS, highlighting key milestones and trends in networking and operating system integration. 7. **Explain how NOS supports multi-user and multitasking** operations across a distributed network infrastructure. 8. **Recognize the basic requirements** for installing and configuring a NOS, such as hardware prerequisites, networking setup, and user roles.			
second	**2 Theoretical 2 Practical**	1. **Identify and describe the primary functions of a Network Operating System**, including resource management, user authentication, and file sharing. **2. Explain how NOS manages and controls access to shared network resources, such as files, printers, and applications.** **3. Understand the role of NOS in user and group account management, including**	Key Functions of NOS	Traditional slides and Lab	Quiz and lab test

		permissions, roles, and access rights. **4. Describe the processes involved in network communication and data transmission managed by NOS.** **5. Explain how NOS handles process scheduling and task prioritization in a multi-user environment.** **6. Discuss how a NOS provides remote access capabilities and manages sessions from multiple clients.** **7. Analyze the role of NOS in ensuring system security, such as through authentication protocols, encryption, and auditing.** 8. **Compare key functions across different NOS platforms, such as Windows Server, Linux-based NOS, and Unix-based systems.**			
third	**2 Theoretical 2 Practical**	1. **Define network resource management** and explain its significance in a multi-user network environment. 2. **Identify various types of network**	Network Resource Management	Traditional slides and Lab	Quiz and lab test

		resources, including files, folders, printers, memory, and processing time. 3. **Explain how a NOS allocates, monitors, and** manages access to shared resources among users and devices. 4. **Configure shared network resources** such as directories and printers, and manage their permissions and access controls. 5. **Apply user and group policies to** control resource usage effectively in a networked environment. **6. Use administrative tools in NOS (**e.g., file sharing settings, disk quotas, resource monitors) to monitor and manage resource performance**.** **7. Understand the role of file** and print servers in resource management within a network operating system. 8. **Demonstrate the ability to troubleshoot** common resource access issues, such as permission conflicts, unavailable resources, or quota violations**.**			

Fourth	**2 Theoretical 2 Practical**	Midterm 1		Traditional slides and Lab	Quiz and lab test
Fifth	**2 Theoretical 2 Practical**	1. **Define remote access** and explain its purpose and importance in a networked computing environment. 2. **Identify the key components** and protocols used in remote access solutions (e.g., RDP, SSH, VPN). **3. Describe how network operating systems** enable and manage remote access for users and administrators. **4. Configure and manage remote access** services in a NOS, including setting up remote desktop and secure shell (SSH) access. 5. **Apply access control** policies to secure remote sessions, including user authentication, encryption, and session timeouts. 6. **Distinguish between different types of remote access** methods (e.g., direct remote login, VPN tunneling, remote management tools). 7. **Understand the risks and vulnerabilities** associated with	Remote Access in NOS	Traditional slides and Lab	Quiz and lab test

		remote access and describe mitigation strategies (e.g., firewall settings, two-factor authentication). 8. **Demonstrate basic troubleshooting** of remote access issues, such as connection failures, authentication problems, or performance lags.			
Sixth	**2 Theoretical 2 Practical**	1. **Explain the concept of file system hierarchy** and its role in organizing data within a Network Operating System. 2. **Describe the structure and components** of a typical file system in NOS environments (e.g., root directory, subdirectories, system folders). 3. **Differentiate between local and shared file systems**, and explain how NOS manages each. 4. **Navigate and manage file systems using command-line and GUI tools** in various NOS platforms (e.g., Linux, Windows Server). 5. **Configure shared directories and set access permissions** for users and groups within the file system	File System Hierarchy in NOS	Traditional slides and Lab	Quiz and lab test

		hierarchy. 6. **Apply file system management techniques**, including mounting, unmounting, and mapping network drives. 7. **Understand file naming conventions, path structures, and access protocols** relevant to NOS (e.g., UNC paths, NFS, SMB). 8. **Demonstrate basic administrative tasks**, such as file ownership changes, permission settings, and quota assignments. 9. **Compare the file system structures** of different NOS platforms (e.g., EXT4 in Linux vs. NTFS in Windows Server). 10. **Recognize and resolve common file system-related issues**, such as permission conflicts or inaccessible network shares.			
Seventh	**2 Theoretical 2 Practical**	1. **Define the Domain Name System (DNS)** and explain its purpose in network communication. 2. **Describe how DNS translates domain names into IP addresses**, enabling user-friendly access	Domain Name System (DNS)	Traditional slides and Lab	Quiz and lab test

		to network resources. 3. **Explain the components of the DNS structure**, including domains, subdomains, root servers, authoritative name servers, and resolvers. 4. **Understand and configure DNS roles** in a Network Operating System environment (e.g., setting up a DNS server in Windows Server or BIND in Linux). 5. **Differentiate between forward and reverse DNS lookups**, and describe when each is used. 6. **Configure and manage DNS zones and records**, including A, AAAA, MX, CNAME, and PTR records. 7. **Understand DNS caching and propagation**, and how they affect name resolution across distributed networks. 8. **Troubleshoot common DNS issues**, such as resolution failures, misconfigured zones, or			

		propagation delays. 9. **Secure DNS services** using best practices, such as zone transfers restrictions, DNSSEC, and monitoring tools. 10. **Evaluate the role of DNS in enterprise and cloud environments**, including its integration with Active Directory and scalable cloud-based DNS services.			
Eighth	**2 Theoretical 2 Practical**	Midterm 2		Traditional slides and Lab	
Ninth	**2 Theoretical 2 Practical**	1. **Define the concept of a print server** and explain its role within a network operating system. 2. **Understand how print servers manage print jobs**, queues, and access from multiple network users. 3. **Configure a print server** in common NOS platforms (e.g., Windows Server Print Services, CUPS in Linux). 4. **Add and manage network printers**, including assigning drivers, setting	Printer Server in NOS	Traditional slides and Lab	Quiz and lab test

		defaults, and configuring printer ports. 5. **Apply user and group permissions** to control access to shared printers. 6. **Monitor and manage print queues**, including pausing, resuming, and prioritizing print jobs. 7. **Troubleshoot common printing issues** in a network environment, such as connectivity problems, driver conflicts, or spooler errors. 8. **Explain the differences between local and network printers**, and how NOS enables centralized management. 9. **Implement printer auditing and logging** for usage tracking and security. 10. **Evaluate scalability and efficiency strategies**, such as printer pooling and load balancing, in large network environments.			
tenth	**2 Theoretical 2 Practical**	1. **Define security in the context of Network Operating Systems** and explain	Security of Network	Traditional slides and Lab	Quiz and lab test

		its importance in multi-user network environments. 2. **Identify key security components** in NOS, including authentication, authorization, encryption, and auditing. 3. **Configure user and group permissions** to enforce access control and data protection policies. 4. **Implement authentication mechanisms** such as passwords, multi-factor authentication, and centralized identity management (e.g., Active Directory, LDAP). 5. **Describe common security threats** in network environments, including unauthorized access, privilege escalation, and malware. 6. **Apply file and folder permission models** (e.g., NTFS in Windows, chmod in Linux) to restrict or grant access. 7. **Set up and manage audit policies and logging features** to monitor user activity and detect potential breaches. 8. **Explain the role of**	Operating Systems		

		firewalls and network policies in protecting NOS infrastructure. 9. **Demonstrate how to configure basic security settings** on a NOS platform (e.g., user lockout policies, password complexity rules). 10. **Evaluate best practices for securing a NOS**, including regular updates, role-based access control, and backup strategies.			
eleventh	**2 Theoretical 2 Practical**	1. **Define processes and tasks** within the context of network operating systems. 2. **Explain the importance of process and task scheduling** for efficient resource utilization and system performance in NOS. 3. **Describe common scheduling algorithms** used in NOS, such as First-Come-First-Served (FCFS), Round Robin, Priority Scheduling, and Multilevel Queues. 4. **Understand how NOS manages multitasking and multiprocessing** to support multiple users and network	Process and Task Scheduling	Traditional slides and Lab	Quiz and lab test

		services simultaneously. 5. **Analyze process states and transitions** during execution, including ready, running, waiting, and terminated states. 6. **Explain the role of the scheduler and dispatcher** in process management. 7. **Demonstrate how NOS handles task prioritization and preemption** to ensure fair CPU time allocation. 8. **Configure and monitor process scheduling parameters** using administrative tools in common NOS platforms. 9. **Troubleshoot scheduling-related performance issues**, such as CPU starvation and deadlocks. 10. **Discuss the impact of process** scheduling on network services availability and responsiveness.			
twelfth	**2 Theoretical 2 Practical**	1. **Define cloud computing** and explain its basic concepts, models, and service types (IaaS, PaaS, SaaS).	Cloud Computing in NOS	Traditional slides and Lab	Quiz and lab test

		2. **Describe the relationship between cloud computing and network operating systems**, highlighting how NOS supports cloud infrastructure. 3. **Identify the key characteristics of cloud services**, including scalability, elasticity, on-demand self-service, and resource pooling. 4. **Explain different deployment models of cloud computing**, such as public, private, hybrid, and community clouds. 5. **Understand virtualization technology** and its role in enabling cloud computing environments. 6. **Describe the benefits and challenges of adopting cloud computing** in enterprise networks. 7. **Explore common cloud service providers and platforms** (e.g., AWS, Azure, Google Cloud) and their integration with NOS. 8. **Discuss security**			

		concerns and best practices related to cloud computing, including data privacy, compliance, and identity management. 9. **Demonstrate basic cloud resource management tasks**, such as provisioning virtual machines and managing storage. 10. **Evaluate the impact of cloud computing on network operating system design and administration.**			
thirteenth	**2 Theoretical 2 Practical**	1. **Explain how Network Operating Systems (NOS) serve as a foundation for cloud computing infrastructures.** 2. **Describe the integration of NOS functionalities with cloud services**, such as resource management, user authentication, and security. 3. **Identify the differences and similarities between traditional NOS environments and cloud-based platforms.** 4. **Discuss how cloud computing extends NOS capabilities**,	Relationship Between NOS and Cloud Computing	Traditional slides and Lab	Quiz and lab test

		enabling scalability, virtualization, and distributed resource access. 5. **Explain the role of NOS in managing hybrid cloud environments** that combine on-premises and cloud resources. 6. **Analyze the impact of cloud computing on NOS administration and maintenance tasks.** 7. **Evaluate challenges and benefits of migrating NOS services to the cloud.** 8. **Illustrate examples of cloud-enabled NOS features**, such as centralized management, remote access, and automated updates. 9. **Discuss how NOS supports cloud security frameworks**, including identity management and access control. 10. **Predict future trends** in the evolution of NOS with respect to emerging cloud technologies.			
fourteenth	**2 Theoretical 2 Practical**	1. **Describe the history, development,** and key features of the Linux Ubuntu operating system.	Introduction to Linux Ubuntu OS (Case Study)	Traditional slides and Lab	Quiz and lab test

		2. Explain the role of Ubuntu Linux as a network operating system in various environments. 3. **Identify the Ubuntu Linux** desktop and server editions and their typical use cases. 4. **Navigate the Ubuntu** user interface and command-line environment. 5. **Understand the Ubuntu** file system hierarchy and key system directories. 6. **Demonstrate basic Linux** commands for file management, process monitoring, and system administration. 7. **Explain package** management in Ubuntu using tools like APT (Advanced Package Tool). 8. **Configure basic network** settings and services in Ubuntu, such as IP addressing and SSH. 9. **Understand user and group** management in Ubuntu, including permissions and security settings.			

		10. **Discuss the advantages and** challenges of deploying Ubuntu Linux in networked and cloud environments.			
fifteenth	**2 Theoretical 2 Practical**	Course Review			

11.Course evaluation

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Quizzes	My theory is week 15 My work week is 1-15	3 theoretical	10%
2	Midterm (1)	week (4)	5 theoretical + 5practical)	10%
3	Midterm test (theoretical and practical)	week (9)	5 theoretical + 5 practical	10%
4	Midterm (2)	week (12)	5 theoretical + 5 practical	10%
5	Final practical test	Practical exam week	15	10%
6	Final theoretical test	Theory exam week	50	50%
	Total		100	100%

12.Learning and teaching resources

Required textbooks (methodology, if any)	Windows Server 2019 & PowerShell All-in-One For Dummies by Sara Perrott, Jeffrey R. Shapiro
Main references (sources)	Linux Administration: A Beginner's Guide by Wale Soyinka, 2020, McGraw-Hill Education

Recommended supporting books and references (scientific journals, reports....)	
Electronic references, Internet sites	

Lecturer
Theoretical subject teacher

Lecturer
practical subject teacher

Course description form

1. Course name
Network Programming II
2. Course code
CMNT310
3. Semester/year
2nd Semester / 2024-2025
4. Date this description was prepared
10/06/2024
5. Available attendance forms
Theoretical and Practical
6. Number of study hours (total)/number of units (total)
60/3
7. Name of the course administrator (if more than one name is mentioned)
Dr. Ayad Hussain
8. Course objectives
Advance client-server models using scalable and modular design. - Implement robust multithreaded and asynchronous networking systems. - Integrate encryption, authentication, and certificate management using SSL/TLS. - Develop performance-optimized communication protocols. - Build advanced services such as streaming, synchronization, and remote shell systems. - Utilize select/poll/epoll mechanisms for event-driven network applications. - Implement network packet capture, analysis, and filtering (e.g., using Scapy, Wireshark APIs). - Understand security vulnerabilities and defense strategies in network code. - Design custom application-layer protocols and implement parsers and handlers. - Work with advanced tools and libraries (asyncio, Boost.Asio, libpcap, etc.).
9. Teaching and learning strategies

- Lectures and live demonstrations of real-world protocols
- Advanced hands-on programming labs using multithreading, async, and secure sockets
- Capstone project focused on building an end-to-end networked system
- Code reviews and collaborative debugging sessions
- Use of sniffers and traffic analyzers in lab simulations
- Scenario-based assignments and protocol engineering exercises
- Interactive workshops and toolchain integrations
- Performance testing and security validation challenges

10. Course structure

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
first	2 Theoretical 2Practical	Develop modular scalable designs	Advanced Client-Server Models	Lecture + Lab	Quiz
second	2 Theoretical 2Practical	Use multithreading & async for efficiency	Thread Pools and Async I/O	Lecture + Lab	Assignment
third	2 Theoretical 2Practical	Optimize communication latency	Protocol Optimization	Lab	Test
Fourth	2 Theoretical 2Practical	Design responsive servers	Event-driven Sockets (select/poll/epoll)	Simulation	Lab Evaluation
Fifth	2 Theoretical 2Practical	Implement encrypted sessions	Secure Programming with SSL/TLS	Lab + Lecture	Midterm
Sixth	2 Theoretical 2Practical	Manage keys, certs, and identity	Certificate Validation & Auth	Practice	Quiz
Seventh	2 Theoretical 3Practical	Develop efficient APIs	Advanced HTTP/2 and REST APIs	Project	Assignment
Eighth	2 Theoretical 2Practical	Use sniffers, build analyzers	Packet Capturing and Filtering	Lab + Task	Short Test

Ninth	2 Theoretical 2Practical	Design extensible protocols	Custom Protocol Design II	Case Study	Midterm
tenth	2 Theoretical 2Practical	Build secure remote interaction tools	Remote Shells & File Synchronization	Lab	Assignment
eleventh	2 Theoretical 2Practical	Manipulate low-level protocols	DNS/ICMP/Multicast Extensions	Simulation	Quiz
twelfth	2 Theoretical 2Practical	Measure throughput, stress test	Traffic Simulation and Load Testing	Workshop	Project
thirteenth	2 Theoretical 2Practical	Detect and prevent attacks in code	Vulnerability Testing	Lab	Test
fourteenth	2 Theoretical 2ractical	Integrate all components	Capstone Project Implementation	Project	Presentation
fifteenth	2 Theoretical 2Practical	Summarize, review, and evaluate	Course Wrap-up and Final Exam	Workshop	Final Exam

11. Course evaluation

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Lab Reports	Weekly	10	10%
2	Short Test 1	Week 4	5	5%
3	Midterm Exam	Week 9	20	20%
4	Short Test 2	Week 12	5	5%
5	Practical Test	Practical Exam Week	10	10%
6	Final Exam	Final Exam Week	50	50%

	Total	100	100%

12. Learning and teaching resources	
Required textbooks (methodology, if any)	
Main references (sources)	• Network Programming in C – Richard Stevens • Python Network Programming Cookbook – Dr. M. Nawaz
Recommended supporting books and references (scientific journals, reports....)	• Unix Network Programming – W. Richard Stevens • RFC documentation for protocols
Electronic references, Internet sites	• Online tutorials (GeeksforGeeks, RealPython, etc.) • Socket API references from official docs

Lecturer
Theoretical subject teacher

Lecturer Assist.
practical subject teacher

Course description form

1. Course name
Smart Phone and Tablet Programming I
2. Course code
CMNT311
3. Semester/year
2nd Semester / 2024-2025
4. Date this description was prepared
10/06/2024
5. Available attendance forms
6. Number of study hours (total)/number of units (total)
60/3
7. Name of the course administrator (if more than one name is mentioned)
Yasir Nooruldeen
8. Course objectives

The Smart phone and Tablet programming course for the Networks department aims to achieve the following objectives:

1. Understanding Mobile Application Development: Gain a comprehensive understanding of mobile application development concepts, principles, and technologies.
2. Programming Fundamentals: Develop a solid foundation in programming fundamentals, including variables, data types, control structures, functions, and object-oriented programming.
3. Mobile Platform Familiarity: Acquire in-depth knowledge of the mobile platform, including operating systems, user interfaces, and device capabilities specific to smartphones and tablets.
4. Mobile App Development Frameworks: Explore and utilize popular mobile app development frameworks such as Android Studio (Java/Kotlin) or Xcode (Swift) to build functional mobile applications.
5. User Interface Design: Learn principles and techniques of user interface (UI) design for mobile devices, including layout, navigation, and responsiveness.
6. Data Management: Understand methods and techniques for data management in mobile applications,

such as working with databases, file systems, and cloud storage.

7. Application Testing and Debugging: Learn strategies for testing, debugging, and troubleshooting mobile applications on various devices and platforms.
8. Performance Optimization: Explore techniques for optimizing mobile app performance, including memory management, network efficiency, and battery life.
9. Security and Privacy Considerations: Understand the importance of security and privacy in mobile applications and learn best practices for securing user data and mitigating common vulnerabilities.
10. Integration of Device Features: Explore how to leverage device features such as GPS, camera, sensors, and connectivity in mobile app development.
11. Cross-Platform Development: Gain an understanding of cross-platform development frameworks and techniques to build apps that can run on multiple mobile platforms.
12. App Store Deployment: Learn the process of preparing and submitting mobile applications to app stores, including considerations for app monetization and marketing.
13. Mobile App Maintenance and Updates: Understand the lifecycle of mobile applications, including maintenance, updates, and handling user feedback.
14. Emerging Trends and Technologies: Stay updated with the latest trends, technologies, and advancements in the field of mobile application development.

By the end of the course, students should be proficient in mobile app development, capable of designing and building functional and user-friendly applications for smartphones and tablets. They should have a strong understanding of mobile platform-specific programming languages and tools, and be equipped to adapt to future developments in the mobile industry.

9. Teaching and learning strategies

Learning and teaching strategies for the Smart phone and Tablet programming course for the Network department can include a combination of the following:

The strategies employed in a semester-long Smart Phone and Tablet Programming course may vary depending on the teaching style, resources available, and the desired learning outcomes. Here are some common strategies that instructors may use:

1. Project-Based Learning: Emphasize hands-on learning by assigning projects that involve designing and developing complete mobile applications. This allows students to apply their knowledge and skills to real-world scenarios and gain practical experience.
2. Code Walkthroughs and Demonstrations: Conduct code walkthroughs and live demonstrations to illustrate programming concepts, app development techniques, and best practices. This helps students

understand the process of building mobile apps and provides them with examples to follow.

3. Collaborative Learning: Encourage collaboration among students through group projects, coding exercises, and discussions. This fosters teamwork, problem-solving skills, and peer learning.
4. Mobile App Showcases: Organize showcases or app demos where students can present and demonstrate the mobile apps they have developed during the course. This provides an opportunity for students to showcase their work and receive feedback from their peers and instructors.
5. Code Reviews and Feedback: Conduct regular code reviews to evaluate student projects and provide constructive feedback. This helps students improve their coding skills, learn from their mistakes, and enhance the quality of their mobile app development.
6. Guest Lectures and Industry Insights: Invite guest speakers from the industry who can share their experiences and insights into mobile app development. This exposes students to real-world scenarios and industry practices, keeping them updated on the latest trends and technologies.
7. Problem-Solving Sessions: Organize problem-solving sessions where students can work on challenging programming tasks or debug issues in their mobile applications. This promotes critical thinking, troubleshooting skills, and resilience in problem-solving.
8. Hands-on Labs and Tutorials: Provide hands-on lab sessions and tutorials where students can practice coding, experiment with different features, and explore mobile app development tools. This helps solidify their understanding and build practical skills.
9. Discussion Forums and Q&A Sessions: Establish online discussion forums or conduct regular Q&A sessions where students can ask questions, seek clarification, and engage in discussions related to mobile app development. This encourages active participation and fosters a collaborative learning environment.
10. Continuous Assessment: Implement a mix of quizzes, assignments, projects, and exams throughout the semester to assess student understanding and progress. This allows students to receive timely feedback and track their learning.
11. Stay Updated with Industry Trends: Keep the course content and examples up to date with the latest trends, technologies, and best practices in mobile app development. This ensures that students are equipped with relevant and current knowledge.
12. Resource Sharing and Reference Materials: Provide students with a curated list of resources, including textbooks, online tutorials, documentation, and sample code repositories, to supplement their learning and encourage self-study.

These strategies aim to engage students actively, promote practical application of knowledge, and foster a deep understanding of mobile app development concepts and techniques. The instructor may adapt and modify these strategies based on the specific needs and goals of the course.

10. Course structure

week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
first	2 Theoretical 2Practical	Understand Flutter's purpose, setup the dev environment, run the first app	Introduction to Flutter and Dart	Lecture, Setup Tutorial, Coding Lab	Observation, Lab Completion
second	2 Theoretical 2Practical	Grasp Dart fundamentals, OOP, and syntax	Dart Programming Fundamentals	Hands-on coding, Group Exercises	Dart quiz, Code Review
third	2 Theoretical 2Practical	Build UIs with core layout widgets	Flutter Widgets and UI Basics	Visual design lab, Widget Demos	UI Task, Peer Feedback
Fourth	2 Theoretical 2Practical	Implement multi-screen apps and navigation	Navigation and App Structure	Screen Linking Practice	Mini Project, Demo
Fifth	2 Theoretical 2Practical	Capture and validate user input	Forms and User Input	Form Building Workshop	Lab Assessment
Sixth	2 Theoretical 2Practical	Manage app state using setState and Provider	State Management	Counter App, Provider Tasks	Live Code Evaluation
Seventh	2 Theoretical 3Practical	Handle local data with shared_prefs and SQLite	Local Data Storage	Notes App Lab	CRUD Implementation Review
Eighth	2 Theoretical 2Practical	Fetch and display data from APIs	Networking and APIs	API Integration Practice	JSON Parsing Task
Ninth	2 Theoretical 2Practical	Use device features like camera, GPS	Device Integration	Sensors & Camera Activity	Feature Demo
tenth	2 Theoretical 2Practical	Display media, create animations	Multimedia and Animation	Splash Screen Lab	Animation Review
eleventh	2 Theoretical 2Practical	Debug, test and write unit/widget tests	App Testing and Debugging	Testing Workshop	Error Fixing Challenge

twelfth	2 Theoretical 2Practical	Optimize UI and performance	Performance Optimization	App Profiling Task	Optimization Report
thirteenth	2 Theoretical 2Practical	Build and sign app for deployment	App Deployment - Android & iOS	Release Build Practice	Signed APK Submission
fourteenth	2 Theoretical 2ractical	Apply monetization strategies and store guidelines	Monetization and Publishing	Store Assets & Policy Review	Ad/Payment Integration
fifteenth	2 Theoretical 2Practical	Finalize and present complete Flutter app	Final Project Completion	Individual/Group Project	Project Presentation

11. Course evaluation

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15	7 theoretical + 6 practical	13%
2	short test (1) Who	week (3)	4 theoretical + 2 practical	6%
3	Midterm test (theoretical and practical)	week (9)	10 theoretical + 5 practical	15%
4	short test (1) Who	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	Practical exam week	10	10%
6	Final theoretical test	Theory exam week	50	50%
	Total		100	100%

12. Learning and teaching resources	
Required textbooks (methodology, if any)	
Main references (sources)	
Recommended supporting books and references (scientific journals, reports....)	
Electronic references, Internet sites	

Lecturer
Theoretical subject teacher

Lecturer Assist.
practical subject teacher

Course description form

1. Course name
Network Security -1-
2. Course code
CMNT312
3. Semester/year
Second semester / 2025
4. Date this description was prepared
Dec-2024
5. Available attendance forms
In Class
6. Number of study hours (total)/number of units (total)
60 hours / 3 Units
7. Name of the course administrator (if more than one name is mentioned)
Dr.Omar Abdulmunem Ibrahim Aldabbagh
8. Course objectives

*Understand fundamental concepts of computer and network security and their importance in modern computing environments. *Analyze the OSI security architecture and its role in securing network communications. *Identify and classify various types of security attacks, threats, and vulnerabilities. *Explore security services and mechanisms used to protect information systems. *Implement LAN security measures and configure switch security features. *Master Access Control Lists (ACLs) for network traffic filtering and security	

enforcement.
*Understand cryptographic principles including symmetric and asymmetric encryption techniques.

9. Teaching and learning strategies

*Theoretical lectures covering security concepts and principles
*Hands-on lab sessions using network simulators and security tools
*Case studies analyzing real-world security incidents and breaches
*Practical exercises in configuring security mechanisms and encryption
*Group projects focusing on security assessment and implementation
*Demonstrations of security attacks and defense mechanisms

10. Course structure

week	**hours**	**Required learning outcomes**	**Name of the unit or topic**	**Learning method**	**Evaluation method**
First	2/2	Understand the importance and scope of network security	Introduction to Computer and Network Security	Lecture + Lab	Class Discussion
Second	2/2	Learn fundamental security concepts and terminology	Computer Security Concepts	Lecture + Practical	Quiz

Third	2/2	Analyze the OSI security architecture framework	The OSI Security Architecture	Lecture + Lab	Practical Exercise
Fourth	2/2	Identify and classify different types of security attacks	Security Attacks	Lecture + Demo	Assignment
Fifth	2/2	Explore various security services and their applications	Security Services	Lecture + Lab	Quiz/Test
Sixth	2/2	Understand security mechanisms and their implementation	Security Mechanisms	Lecture + Practical	Homework
Seventh	2/2	Implement LAN security measures and best practices	LAN Security	Lecture + Lab	Practical Task
Eighth	2/2	Configure switch security features and protocols	Switch Security	Lecture + Configuration	Assignment
Ninth	2/2	Midterm review and practice	Review Session	Discussion + Lab Review	Midterm Exam
Tenth	2/2	Midterm Examination	Midterm	Written + Practical	Midterm
Eleventh	2/2	Design and implement Access Control Lists	Access Control List (ACL)	Lecture + Lab	Quiz

Twelfth	2/2	Understand cryptographic fundamentals and principles	Introduction to Cryptography	Lecture + Practical	Homework
Thirteenth	2/2	Explore symmetric encryption algorithms and applications	Symmetric Encryption	Lecture + Lab	Assignment
Fourteenth	2/2	Analyze asymmetric encryption and public key cryptography	Asymmetric Encryption	Lecture + Lab	Report
Fifteenth	2/2	Course review and security project presentations	Review and Project Presentations	Presentation + Lab Demo	Participation

11. Course evaluation

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15	7 theoretical + 6 practical	13%
2	short test (1) Who	week (3)	4 theoretical + 2 practical	6%
3	Midterm test (theoretical and practical)	week (9)	10 theoretical + 5 practical	15%
4	short test (1) Who	week (12)	4 theoretical + 2 practical	6%
5	Final practical test	Practical exam week	10	10%

6	Final theoretical test	Theory exam week	50	50%
	total		100	100%

12. Learning and teaching resources	
Required textbooks (methodology, if any)	• **Network Security Essentials by William Stallings** • **Cryptography and Network Security by William Stallings**
Main references (sources)	• **Computer Security: Principles and Practice by William Stallings and Lawrie Brown** • **Introduction to Computer Security by Matt Bishop** • **Cisco Networking Academy Cybersecurity materials**
Recommended supporting books and references (scientific journals, reports....)	• **Security+ Guide to Network Security Fundamentals** • **Applied Cryptography by Bruce Schneier** • **IEEE Security & Privacy Magazine** • **ACM Transactions on Information and System Security** • **NIST Cybersecurity Framework documentation**
Electronic references, Internet sites	• **https://www.cisco.com/c/en/us/products/security/** • **https://www.sans.org** • **https://www.nist.gov/cybersecurity** • **https://owasp.org**

	• **https://www.cybrary.it** • **https://www.schneier.com**

Lecturer
Theoretical subject teacher
Dr.Omar Abdulmunem Aldabbagh

Lecturer Assist.
practical subject teacher

Course description form

1. Course name : Server Administration 1

2. Course code : CMNT313

3. Semester/year : Second Semester / 2025

4. Date this description was prepared : 3 / 1 /2025

5. Available attendance forms : yes

6. Number of study hours (total)/number of units (total) 60 / 3

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

8. Course objectives:

This course introduces students to the essential technical and professional skills required in the fields of Network Administration.

1. Workgroup administration manner
2. Domain administration manner:
   - Group policy
   - File server: set the user permissions on Server sharing folders
   - Quota management and the File Screen
   - Print server: install the printer driver in the Server and then make this device driver as a sharing device driver.
   - Windows server update service (WSUS): install WSUS in Server , download the windows update from the Internet and then send this update to the pcs.
   - Windows deployment service (WDS): installation the widows on pcs through the

domain.

- Hyper-v: virtualization application for Microsoft: Virtual O.S in the original O.S of the pc.

(VMware for example)

- DR (Disaster recovery): windows server backup (additional Domain controller = backup from the primary domain controller)

9. Teaching and learning strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course structure

Week	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
first: 19/01/2025	**2 Theoretical 2 Practical**	Introduction to network administration	Workgroup and domain	Data show and White-board	Home-work and Quiz
Second 26/01/2025	**2 Theoretical 2 Practical**	Users and groups	Types of users and groups and manage them.	Data show and White-board	Home-work and Quiz
Third 02/02/2025	**2 Theoretical 2 Practical**	Policy	Mange the security policy and the permissions on the objects	Data show and White-board	Home-work and Quiz
Fourth 09/02/2025	**2 Theoretical 2 Practical**	Inheritance	Inheritance of Security Permissions	Data show and White-board	Home-work and Quiz
Fifth 16/02/2025	**2 Theoretical 2 Practical**	Sharing	Mange the sharing objects	Data show and White-board	Home-work and Quiz
Sixth 23/02/2025	**2 Theoretical 2 Practical**	Quota	Mange the quota of the hard disk	Data show and White-board	Home-work and Quiz

Seventh 02/03/2025	**2 Theoretical 2 Practical**	Network printers	Mange the sharing printers	Data show and White-board	Home-work and Quiz
Eighth 09/03/2025	**2 Theoretical 2 Practical**	First exam	First exam	Data show and White-board	Home-work and Quiz
Ninth 16/03/2025	**2 Theoretical 2 Practical**	Network printers	Mange the properties option in the Manage Button of Printers	Data show and White-board	Home-work and Quiz
Tenth 23/03/2025	**2 Theoretical 2 Practical**	File systems	NTFS vs FAT32 and permissions conflict	Data show and White-board	Home-work and Quiz
Eleventh 30/03/2025	**2 Theoretical 2 Practical**	RDP	Manage the Remote desktop protocol	Data show and White-board	Home-work and Quiz
Twelfth 06/04/2025	**2 Theoretical 2 Practical**	Owner ship	Mange the owner ship	Data show and White-board	Home-work and Quiz
Thirteenth 13/04/2025	**2 Theoretical 2 Practical**	Administrative tools	Local security policy	Data show and White-board	Home-work and Quiz
Fourteenth 20/04/2025	**2 Theoretical 2 Practical**	Administrative tools	User right assignments	Data show and White-board	Home-work and Quiz
Fifteenth 27/04/2025	**2 Theoretical 2 Practical**	Last exam	Last exam	Data show and White-board	Home-work and Quiz

11. Course evaluation

T	Calendar methods	Calendar date (week)	Degree	Relative weight %
1	Theoretical final report + practical experience reports	My theory is week 15 My work week is 1-15	7 theoretical + 6 practical	13%
2	short test (1) Who	week (3)	7 theoretical + 4 practical	11%
3	Midterm test (theoretical and	week (9)	10	15%

	practical)		theoretical + 5 practical	
4	short test (1) Who	week (12)	7 theoretical + 4 practical	11%
5	Final practical test	Practical exam week	20	20%
6	Final theoretical test	Theory exam week	30	30%
	total		100	100%

12. Learning and teaching resources	
Required textbooks (methodology, if any) Book: MCSA windows server 2016-study guide	
Main references (sources) Book: Operational and Administrative Guidance Microsoft Windows 10 and Windows Server.	
Recommended supporting books and references (scientific journals, reports....) Book: CompTIA Server+ .	
Electronic references, Internet sites https://edumefree.com/courses/mcsa-server-2016	

Lecturer
Theoretical subject teacher
Omar Tariq Saleh

Lecturer
practical subject teacher
Omar Tariq Saleh

نموذج وصف المقرر

الشبكات الكلية : علوم الحاسوب والرياضيات القسم: الجامعة : الموصل

1. اسم المقرر والمرحلة الدراسية
أخلاقيات تكنولوجيا المعلومات
2. رمز المقرر
CMNT314
3. الفصل / السنة
٢٠٢٤ – ٢٠٢٥ / الفصل الثاني
4. تاريخ إعداد هذا الوصف
شهر شباط ٢٠٢٥
5. أشكال الحضور المتاحة
حضور فعلي
6. عدد الساعات الدراسية (الكلي) / عدد الوحدات (الكلي)
3 وحدات - 45 ساعة فصلية
7. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر) واللقب العلمي
الآيميل: anas@uomosul.edu.iq الاسم: انس عبدالمجيد الدباغ
8. اهداف المقرر

• فهم المبادئ الأخلاقية الأساسية في مجال تكنولوجيا المعلومات. • تحليل القضايا الأخلاقية المرتبطة بالخصوصية، الأمن السيبراني، الملكية الفكرية، والمساواة الرقمية.	• تطوير مهارات التفكير النقدي في تقييم التحديات الأخلاقية الناشئة عن التكنولوجيا الحديثة. • التعرف على التشريعات والقوانين المحلية والدولية المتعلقة بأخلاقيات التكنولوجيا.

9. استراتيجيات التعليم والتعلم

1- تطوير مهارات التفكير النقدي في تقييم التحديات الأخلاقية الناشئة عن التكنولوجيا الحديثة.	2- التعرف على التشريعات والقوانين المحلية والدولية المتعلقة بأخلاقيات التكنولوجيا.

10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
1	**3**	تعريف أخلاقيات التكنولوجيا وأهميتها. تاريخ تطور أخلاقيات الكمبيوتر.	مقدمة في أخلاقيات تكنولوجيا المعلومات	محاضرة + نقاش مفتوح	مشاركة في النقاش
الأسبوع 2	**3**	الخصوصية، الأمان، النزاهة، المسؤولية. دراسات حالة عن انتهاكات أخلاقية.	القيم والمبادئ الأخلاقية في التكنولوجيا	تحليل حالات + عروض تقديمية	تقرير قصير
الأسبوع 3	**3**	مفهوم الخصوصية وجمع البيانات. أدوات المراقبة الإلكترونية (مثل الكوكيز).	الخصوصية في العصر الرقمي (الجزء 1)	ورشة عمل حول سياسات الخصوصية	تحليل سياسة خصوصية لشركة
الأسبوع 4	**3**	التشريعات العالمية (**GDPR**، **CCPA**). حق النسيان والحق في الوصول إلى البيانات.	الخصوصية في العصر الرقمي (الجزء 2)	مناظرة حول "الموازنة بين الخصوصية والأمن	اختبار قصير
الأسبوع 5	**3**	أنواع التهديدات (القرصنة، البرمجيات الخبيثة). استراتيجيات الحماية (التشفير، الجدران النارية).	الأمن السيبراني والجريمة الإلكترونية	محاضرة + عرض فيديوهات توضيحية	حلقة نقاش حول فيديو تعليمي

الأسبوع6	**3**	جرائم الإنترنت (سرقة الهوية، التصيد الاحتيالي). •التدابير الوقائية والتوعية	الأمن السيبراني والجريمة الإلكترونية (الجزء 2)	دراسة حالة (اختراق فيسبوك 2018)	عرض تقديمي جماعي
الأسبوع 7	**3**	أنواع الملكية الفكرية (حقوق النشر، البراءات). تحديات القرصنة الرقمية.	الملكية الفكرية في التكنولوجيا (الجزء 1)	نقاش حول "مفتوح المصدر **vs** . الاحتكارية"	مقال حول تأثير القرصنة
الأسبوع 8	**3**	الذكاء الاصطناعي والبلوك تشين. التشريعات الدولية (مثل **WIPO**.)	الملكية الفكرية في التكنولوجيا (الجزء 2)	محاضرة ضيف من خبير قانوني	اختبار مفاهيمي
الأسبوع 9	**3**	أسباب الفجوة الرقمية (اقتصادية، جغرافية). تأثيرها على التعليم والتوظيف.	المساواة في التكنولوجيا - الفجوة الرقمية	تحليل إحصاءات عالمية	تقرير عن فجوة رقمية في دولة محددة
الأسبوع 10	**3**	التميز في التوظيف التقني. مبادرات تعزيز التنوع (مثل برامج تمكين النساء).	المساواة في التكنولوجيا - التمثيل العرقي والجندري	ورشة عمل "تصميم سياسة شمولية	عرض تقديمي لمبادرة مقترحة
الأسبوع 11	**3**	معايير الوصول الشامل (مثل قارئات الشاشة). التكنولوجيا المساعدة.	التكنولوجيا وذوي الاحتياجات الخاصة	تجربة محاكاة للإعاقة البصرية	تقييم موقع إلكتروني لمدى إمكانية الوصول
الأسبوع 12	**3**	حدود الحرية في الفضاء الرقمي. الرقابة الحكومية والتضليل الإعلامي.	حرية التعبير والرقابة على المحتوى	مناظرة "الرقابة **vs** . الحرية المطلقة".	تحليل مقال إخباري عن حجب مواقع
الأسبوع 13	**3**	النفايات الإلكترونية والاستدامة. مبادرات التكنولوجيا الخضراء.	التأثير البيئي للتكنولوجيا	زيارة افتراضية إلى مصنع إعادة تدوير	اقتراح مشروع مستدام
الأسبوع 14	**3**	تلخيص المفاهيم الرئيسية. حل تمارين تطبيقية.	مراجعة عامة وتطبيقات عملية	جلسة أسئلة وأجوبة تفاعلية	اختبار مراجعة (لا يحسب في الدرجة النهائية)
الأسبوع 15	**3**	عرض المشاريع البحثية للطلاب	تقديم المشاريع النهائية	عروض تقديمية + نقاش جماعي	تقييم المشروع النهائي (30% من الدرجة)

11. تقييم المقرر وتقسيمات الدرجة	
	• التحضير والمشاركة: 20% • الاختبارات القصيرة: 20% • التقارير والعروض: 20% • الامتحان النهائي: 40%
12. مصادر التعلم والتدريس	
الكتب المقررة المطلوبة (المنهجية أن وجدت)	اللائحة العامة لحماية البيانات (GDPR.) قانون حماية خصوصية المستهلك في كاليفورنيا (CCPA).
المراجع الرئيسة (المصادر)	• "أخلاقيات الكمبيوتر" - والتر مادر.
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية, التقارير...)	
المراجع الإلكترونية, مواقع الانترنيت	
نسبة تحديث المنهاج او الوصف	100%

اسم وتوقيع رئيس القسم او الفرع

اسم وتوقيع صاحب المقرر