

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



Academic Program and Course Description Guide

2024

Introduction:

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

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

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

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

Concepts and terminology:

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

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

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

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

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

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

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

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

Academic Program Description Form

University Name:Diyala.....

Faculty/Institute:College of Sciences.....

Scientific Department:Computer Sciences.....

Academic or Professional Program Name:Bachelor's in Computer Sciences.....

Final Certificate Name: Bachelor's in Computer Sciences.....

Academic System: ...Semester Study System.....

Description Preparation Date: 10/4/2024

File Completion Date: 10/4/2024



Signature:

Head of Department Name: Bashar Talib Hemmed



Signature::

Scientific Associate Name: Munther Hamza Radi

Date: 12/4/2024

Date:12/4/2024

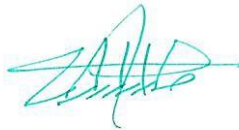
The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department: **Ghassan Sabeeh Mahmood**

Date: 12/4/2024

Signature:



**Approval of the Dean
Prof: Taha Muhammad Hassan**

1. Program Vision

Computer science is considered one of the modern applied sciences intertwined with all other sciences. It occupied a prominent degree and position in scientific studies in colleges and universities in the world. The establishment of the Computer Science Department in the College of Science at Diyala University came with the establishment of the college in the year 2002-2003, and since that date I graduated from the department. The sixteenth session, the last of which was the 2020-2021 session, and postgraduate studies were introduced in the year 2015-2016 to obtain a master's degree, and 20 students were accepted for the academic year 2020-2021. In the same year, a doctoral study was introduced in computer science, and it is hoped that doctoral students will be accepted for the academic year 2021 -2022.

2. Program Mission

The Computer academic staff pursues a multifaceted charge at (Diyala) University. The Department of Computer Science, since its inception, has enjoyed a distinguished scientific reputation among the faculties of science. In general, the department dedicates the capabilities to maintain the highest scientific level, as the department provides a wide study and research program within the disciplines of computer science. This is to provide academic opportunities for undergraduate and postgraduate students. Every year, many original scientific researches are carried out in various branches of computer science. At the level of preliminary studies, the department provides the opportunity to obtain a bachelor's degree in computer science by giving practical and theoretical lessons, as well as scientific research in all the specializations of the department, as the subjects taught during the four academic years qualify graduates to work according to their specialization, wherever they are needed in the fields of the jobs.

3. Program Objectives

The objective of the service courses is to teach specific programming languages, operating systems, environments, and other specific knowledge. They are to serve the community, other programs within the University, and majors and minors, by teaching application-area-specific knowledge to students.

The overall objective of the Computer Science faculty is to successfully implement the Computer Science major. In order to do this, the faculty have the objectives of successfully

teaching a variety of courses, using current technology, giving students hands-on experiences, renewing their professional skills and knowledge base, sharing activities and knowledge with other professionals, and regularly reviewing and updating curriculum based on professional organization guidelines and both student and advisory board input.

4. Program Accreditation

Does the program have program accreditation? And from which agency? NO

5. Other external influences

Is there a sponsor for the program? NO

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	4	4		
College Requirements	----	---		
Department Requirements	54	160		
Summer Training				
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
Semester 1	COS-101	Differentiation Methods	3	---
	COM-111	Introduction to Programming	2	2
	COM-112	Computational mathematics	3	---
	COM-113	Computer Skills (I)	2	2
	COM-114	Digital Logic	2	2
	UD01	English Language	2	---
Semester 2	COS-102	Integration Methods	3	---

	COM-121	Programming Fundamentals	2	2
	COM-122	Discrete Structures	3	---
	COM-123	Computer Organization	2	2
	UD02	Human Rights and democracy	2	---
	UD03	Arabic Language	2	---
Semester 3	COM-211	Introduction to Object Oriented Language	2	2
	COM-212	Data Structures	2	2
	COM-213	Computation Theory	3	---
	COM-214	Web Design and Programming	2	2
	SCI-103	Numerical Methods	2	2
	SCI-104	Probability and Statistics	3	---
Semester 4	COM-221	Algorithms Design and Analysis	2	2
	COM-222	Computer Graphics	2	2
	COM-223	Computer Architecture	3	---
	COM-224	Introduction to Python	2	2
	COM-225	Object Oriented Programming	2	2
	COM-225	Visual Programming	2	2
Semester 5	COM-311	Language Translator	2	2
	COM-312	Artificial Intelligence	2	2
	COM-313	Cryptography	2	2
	COM-314	Digital Image Processing	2	2
	COM-315	Introduction to Database	2	2
	COM-316	Research Methodology	3	---
Semester 6	COM-321	Software Engineering	2	2
	COM-322	Web applications Development	2	2
	COM-323	Computer Security	2	2
	COM-324	Knowledge Representation	3	---
	COM-325	Distributed Database	2	2
	COM-326	Pattern Recognition	2	2
Semester7	COM-411	Introduction Operating Systems	2	2
	COM-412	Machine Learning	2	2
	COM-413	Computer Networks	2	2
	COM-414	Multimedia	2	2
	COM-415	Coding and Data Compression	3	---
	SCI-106	Research Project (I)	---	6
Semester8	COM-421	Techniques of Operating Systems	2	2

	COM-422	Data Mining	3	---
	COM-423	Network Security	3	---
	COM-424	Modeling and Simulation	3	---
	COM-425	Evolutionary Computing	3	---
	SCI-107	Research Project (II)	---	6

8. Expected learning outcomes of the program

Knowledge

A1:: design and represent the flow of simple computer programs in a standard design language;

A2:: describe and use the basic concepts of classes and objects in computer programs;

A3:: create and manipulate simple databases;

A4:: describe the structure of a computing system, the design of its basic components and explain the interactions of hardware and software components;

Skills

B1:: manipulate data and data representation through logical and numerical techniques;

B2:: understand fundamental concepts of network tools;

B3:: describe the file architecture and the organization of a web site;

B4:: describe the main ethical, social, legal and professional issues in Computer Science and Software Engineering;

Ethics

C1:: Creating a spirit of teamwork among students through laboratory groups, graduation projects, and reports.

C2:: Boosting students' self-confidence through daily discussions via seminars.

C3:: Enhancing students' confidence in facing challenges by completing their academic journey through acquiring skills to engage in the job market.

C4:: Statement of the positive effects when embodying these values, and the negative effects when lacking them, through encouragement, intimidation, intrigue, and motivation.

9. Teaching and Learning Strategies

- Explanation using various modern presentation tools:
- Lecture method and use of interactive whiteboard.
- Providing students with basics and additional topics related to software programs.
- Forming discussion groups during lectures to discuss modern systems that require thinking and analysis.
- Asking students a set of critical thinking questions during lectures, such as what, how, when, and why, about specific topics.
- Assigning students homework that requires self-explanatory causal explanations.

10. Evaluation methods

- Practical exams
- Theoretical exams
- Reports and studies
- Daily quizzes with self-solvable questions
- Grades determined by homework assignments

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Computer Science	Artificial Intelligence Simulation			Staff	
Professor	Computer Science	Computer Science			Staff	
Professor	Computer Science	Technology and Computer Science			Staff	
Professor	Computer Science	Object-Oriented and Visual Programming			Staff	
Professor	Computer Science	Computer Application Technologies"			Staff	
Assistant Professor	Computer Science	Computational/Bioinformatics			Staff	
Assistant Professor	Computer Science	Information Technology			Staff	
Assistant Professor	Computer Science	Bioinformatics			Staff	
Assistant Professor	Computer Science	Information Technology			Staff	

Assistant Professor	Computer Science	Computing/Information Technology			Staff	
Assistant Professor	Computer Science	Computer Networks			Staff	
Assistant Professor	Computer Science	Information Technology			Staff	
Assistant Professor	Computer Science	Information Technology			Staff	
Lecturer	Electrical Engineering	Communications			Staff	
Lecturer	Computer Science	Computer Science/Cyber security/Data Encryption			Staff	
Lecturer	Computer Science	Computer Science			Staff	
Lecturer	Computer Science	Computer Science			Staff	
Lecturer	Computer Science	Computer Science			Staff	
Lecturer	Computer Science	Computer Science			Staff	
Assistant Lecturer	Computer Science	Computer Science			Staff	
Assistant Lecturer	Computer Science	Computer Science			Staff	

Professional Development

Mentoring new faculty members

1. Conducting developmental courses for newly hired individuals to enhance their competencies.
2. Hosting developmental seminars for newly hired individuals to enhance their competencies.
3. Organizing developmental workshops for newly hired individuals to enhance their competencies.

Professional development of faculty members

Participating in delivering lectures for secondary subjects under the supervision of the department chair to prepare for giving lectures on core subjects.

12. Acceptance Criterion

central admission

13. The most important sources of information about the program

Ministry of Higher Education and Scientific Research
University of Diyala
College of Science
Department of Computer Science
College of Science website <https://sciences.uodiyala.edu.iq>

14. Program Development Plan

We are seeking academic program accreditation

Program Skills Outline

				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Semester 1	COS-101	Differentiation Methods	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-111	Introduction to Programming	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-112	Computational mathematics	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-113	Computer Skills (I)	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-114	Digital Logic	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	UD01	English Language	optional	●	●	●	●	●	●	●	●	●	●	●	●

Semester 2	COS-102	Integration Methods	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-121	Programming Fundamentals	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-122	Discrete Structures	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-123	Computer Organization	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	UD02	Human Rights and democracy	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	UD03	Arabic Language	Basic	●	●	●	●	●	●	●	●	●	●	●	●
Semester 3	COM-211	Introduction to Object Oriented Language	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-212	Data Structures	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-213	Computation Theory	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-214	Web Design and Programming	optional	●	●	●	●	●	●	●	●	●	●	●	●
	SCI-103	Numerical Methods	optional	●	●	●	●	●	●	●	●	●	●	●	●

	SCI-104	Probability and Statistics	optional	●	●	●	●	●	●	●	●	●	●	●	●
Semester 4	COM-221	Algorithms Design and Analysis	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-222	Computer Graphics	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-223	Computer Architecture	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-224	Introduction to Python	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-225	Object Oriented Programming	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-225	Visual Programming	Basic	●	●	●	●	●	●	●	●	●	●	●	●
Semester 5	COM-311	Language Translator	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-312	Artificial Intelligence	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-313	Cryptography	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-314	Digital Image Processing	Basic	●	●	●	●	●	●	●	●	●	●	●	●

Semester 6	COM-315	Introduction to Database	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-316	Research Methodology	optional	●	●	●	●	●	●	●	●	●	●	●	●
	COM-321	Software Engineering	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-322	Web applications Development	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-323	Computer Security	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-324	Knowledge Representation	optional	●	●	●	●	●	●	●	●	●	●	●	●
	COM-325	Distributed Database	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-326	Pattern Recognition	optional	●	●	●	●	●	●	●	●	●	●	●	●
Semester 7	COM-411	Introduction Operating Systems	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-412	Machine Learning	optional	●	●	●	●	●	●	●	●	●	●	●	●
	COM-413	Computer Networks	Basic	●	●	●	●	●	●	●	●	●	●	●	●

Semester 8	COM-414	Multimedia	optional	●	●	●	●	●	●	●	●	●	●	●	●
	COM-415	Coding and Data Compression	optional	●	●	●	●	●	●	●	●	●	●	●	●
	SCI-106	Research Project (I)	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-421	Techniques of Operating Systems	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-422	Data Mining	optional	●	●	●	●	●	●	●	●	●	●	●	●
	COM-423	Network Security	Basic	●	●	●	●	●	●	●	●	●	●	●	●
	COM-424	Modeling and Simulation	optional	●	●	●	●	●	●	●	●	●	●	●	●
	COM-425	Evolutionary Computing	optional	●	●	●	●	●	●	●	●	●	●	●	●
SCI-107	Research Project (II)	Basic	●	●	●	●	●	●	●	●	●	●	●	●	

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

Course Description Form

1. Course Name: Coding and Data Compression	
2. Course Code: COM-415	
3. Semester / Year: Semester	
4. Description Preparation Date: 2024	
5. Available Attendance Forms: Mandatory attendance	
6. Number of Credit Hours (Total) / Number of Units (Total) : 3 hours theoretical + per week / 3 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Burhan Molan saleh	
Email:	
8. Course Objectives	
<p>The essential course "Data Encoding and Compression" focuses on teaching students the key elements of data encoding and compression scientifically and specifically. This includes the types of algorithms used in data encoding and compression, their differences, advantages, disadvantages, and implications. The curriculum aims to:</p> <p>1- Ensure that students understand the principles of data encoding and compression, in addition to the applied fields in which this field is involved, in order to successfully meet the course requirements.</p> <p>2- Familiarize students with various research methods and types.</p> <p>3- Enhance students' ability to use available software in this field, along with the programming and compression skills they acquire.</p>	
9. Teaching and Learning Strategies	
Strategy	1- Enable students to solve problems related to the intellectual framework of the scientific research method.

	2- Enable students to solve problems in a scientific manner and on p scientific bases
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10. Course Structure

Evaluation method	Education method	Unit name and/or topic	Required learning outcomes	hours	Week
Oral or written test	Electronic lecture using Microsoft Editor	Introduction to coding and data compression		4	1
Oral or written test	Electronic lecture using Microsoft Editor	Basic techniques and methods		4	2
Oral or written test	Electronic lecture using Microsoft Editor	Basic VL codes		4	3
Oral or written test	Electronic lecture using Microsoft Editor	Statistical Methods		4	4
Oral or written test	Electronic lecture using Microsoft Editor	Statistical Methods		4	5
Oral or written test	Electronic lecture using Microsoft Editor	Image compression		4	6
Oral or written	Electronic lecture using	Image compression		4	7
		Exam1		4	8
	Electronic	Wavelet methods		4	9
		Video compression		4	10
Oral or written test	Electronic lecture using	Video		4	11

	Microsoft Editor	compression			
Oral or written test	Electronic lecture using Microsoft Editor	Audio compression		4	12
Oral or written test	Electronic lecture using Microsoft Editor	Audio compression		4	13
Oral or written test	Electronic lecture using Microsoft Editor	Presentation		4	14
Oral or written test	Electronic lecture using Microsoft Editor	Exam2		4	15
				4	16

11.Course Evaluation

- Practical exams
 2- Theoretical exams
 3- Reports and studies
 4- Daily quizzes with self-solvable questions
 5- Grades determined by homework assignments

12.Learning and Teaching Resources

The required textbooks (if any) and methodology	Handbook of Data Compression fifth
The main references (sources):	Sayood, Khalid. <i>Introduction to data compression</i>. Morgan Kaufmann, 2017.
Recommended supporting books and references (scientific journals, reports, etc.):	Salomon, David, and Giovanni Motta. <i>Handbook of data compression</i>. London; New York: Springer,, 2010.

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Course Description Form

13. Course Name:
Computational Security1
14. Course Code:
COM23
15. Semester / Year:
Semester
16. Description Preparation Date:
14/4/2024
17. Available Attendance Forms:
Attendance inside the university
18. Number of Credit Hours (Total) / Number of Units (Total) 3

2 theoretical + 2 practical sessions per week.

19. Course administrator's name (mention all, if more than one name)
Name: <i>Ghasan mahmod sabih</i> Email:

20. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> The aim is to prepare scientifically minded students who can recognize characteristics of efficient programs and utilize data protection features addition to what is used in programming languages.

21. Teaching and Learning Strategies	
Strategy	<ul style="list-style-type: none"> Explaining using various modern presentation tools: Lecture method and using interactive whiteboard. Providing students with basics and additional topics related to data protection. Forming discussion groups during lectures to discuss modern systems that require thinking and analysis. Asking students a set of critical thinking questions during lectures such as what, how, when, and why for specific topics. Assigning students homework that requires self-explanatory causal explanations.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction		Lecture Base	
2	3	Cryptography		Lecture Base	

3	3	Stream Ciphers		Lecture Base	
4	3	Data Encryption Standard (DES) part 1		Lecture Base	
5	3	Data Encryption Standard (DES) part 2		Lecture Base	
6	3	Advanced Encryption Standard (AES) part 1		Lecture Base	
7	3	Advanced Encryption Standard (AES) part 2		Lecture Base	
8	3	Exam 1		Lecture Base	
9	3	More About Block Ciphers		Lecture Base	
10	3	Introduction to Public-Key Cryptography		Lecture Base	
11	3	Essential Number Theory for Public-Key Algorithms		Lecture Base	
12	3	The RSA Cryptosystem		Lecture Base	
13	3	Finding Large Primes for RSA , Attacks and countermeasures		Lecture Base	
14	3	Public-Key Cryptosystems Based on the Discrete Logarithm Problem		Lecture Base	
15	2	Exam 2		Lecture Base	

23.Course Evaluation

- Practical exams
- 2- Theoretical exams
- 3- Reports and studies
- 4- Daily quizzes with self-solvable questions
- 5- Grades determined by homework assignments

24.Learning and Teaching Resources

Required textbooks (curricular book any)	
Main references (sources)	<p>Understanding Cryptography, Christof Paar · Jan Pelzl .</p> <ul style="list-style-type: none"> • Cryptography and Network Security: Principles and Practice, William Stallings
Electronic References, Websites	

Course Description Form

25.Course Name:
Computational Security2
26.Course Code:
COM24
27.Semester / Year:
Semester
28.Description Preparation Date:

14/4/2024

29. Available Attendance Forms:

Attendance inside the university

30. Number of Credit Hours (Total) / Number of Units (Total) 3

2 theoretical + 2 practical sessions per week.

31. Course administrator's name (mention all, if more than one name)

Name: *Ghasan mahmod sabih*

Email:

32. Course Objectives

Course Objectives

- The aim is to prepare scientifically minded students who can recognize characteristics of efficient programs and utilize data protection features addition to what is used in programming languages.

33. Teaching and Learning Strategies

Strategy

- Explaining using various modern presentation tools: Lecture method and using interactive whiteboard.
- Providing students with basics and additional topics related to data protection.
- Forming discussion groups during lectures to discuss modern systems that require thinking and analysis.
- Asking students a set of critical thinking questions during lectures such as what, how, when, and why for specific topics.
- Assigning students homework that requires self-explanatory causal explanations.

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction		Lecture Base	
2	3	Elliptic Curve Cryptosystems		Lecture Base	
3	3	Elliptic Curve Models		Lecture Base	
4	3	Digital Signatures Digital Signatures Models		Lecture Base	
5	3			Lecture Base	
6	3	Hash Functions Hash Functions Family		Lecture Base	
7	3	Exam 1		Lecture Base	
8	3	Message Authentication Codes (MACs)		Lecture Base	
9	3	Key Establishment		Lecture Base	
10	3	Access controls		Lecture Base	

11	3	Models of Access controls		Lecture Base	
12	3	Introduction		Lecture Base	
13	3	Protocols		Lecture Base	
14	3	Protocols types		Lecture Base	
15	2	Exam 2		Lecture Base	

35. Course Evaluation

- Practical exams
- 2- Theoretical exams
- 3- Reports and studies
- 4- Daily quizzes with self-solvable questions
- 5- Grades determined by homework assignments

36. Learning and Teaching Resources

Required textbooks (curricular books any)	
Main references (sources)	<p>Understanding Cryptography, Christof Paar · Jan Pelzl .</p> <ul style="list-style-type: none"> • Cryptography and Network Security: Principles and Practice, William Stallings
Electronic References, Websites	

Course Description Form

37. Course Name: Evolutionary Computing

38. Course Code: 412COEC

39. Semester / Year: Second Semester / 2023-2024

40. Description Preparation Date: 2024

41. Available Attendance Forms: Mandatory attendance

42. Number of Credit Hours (Total) / 3 hours theoretical per week / 3 Units

43. Course administrator's name (mention all, if more than one name)

Name: Prof. Dr. Ziyad Tariq Mustafa Al-Ta'i

Email: Ziyad1964tariq@uodiyala.edu.iq

44. Course Objectives

Teaching the student machine learning methods (the calculator) that depend on inference and prediction of future events through statistical methods, artificial networks and their practical (software) application aimed at the development of technological innovations.

Teaching and educating students on all the necessary and necessary information related to machine learning which qualifies them to work and research in all areas of research and prediction methods

45. Teaching and Learning Strategies

Strategy	1- Enable students to solve problems related to the intellectual framework of the scientific research method. 2- Enable students to solve problems in a scientific manner and on pure scientific bases
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10. Course Structure

Evaluation method	Education method	Unit name and/or topic	Required learning outcomes	hours	Week
Oral or written test	Electronic lecture using Microsoft Editor	Evolutionary Computation Introduction		3	1
Oral or written test	Electronic lecture using Microsoft Editor	Biological Evolutionary theory		3	2
Oral or written test	Electronic lecture using Microsoft Editor	Genetic Algorithms Types		3	3
Oral or written test	Electronic lecture using Microsoft Editor	Seeding the population and Encoding		3	4
Oral or written test	Electronic lecture using Microsoft Editor	Selection		3	5
Oral or written test	Electronic lecture using Microsoft Editor	Selection Types		3	6
Oral or written	Electronic	Crossover		3	7
				3	8
	Electronic	Mutation		3	9
				3	10
Oral or written test	Electronic lecture using Microsoft Editor	Complete Example		3	11
Oral or written test	Electronic lecture using Microsoft Editor	TSP using Genetic		3	12
Oral or written test	Electronic lecture using Microsoft Editor	Routing using genetic		3	13
Oral or written	Electronic	4 Queen puzzle using genetic		3	14

test	lecture using Microsoft Editor				
Oral or written test	Electronic lecture using Microsoft Editor	Genetic tutorial		3	15

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

Required textbooks (curricular books any)	Machine Learning, Tom Mitchell, McGraw Hill Press, 1997
Main references (sources)	1- Fundamentals of genetic algorithms: Architecture, Algorithms, and Applications, Laurene Fausett, 2002.
Recommended books and references (scientific journals, reports...)	- Practical Genetic Algorithms, Randy L. Haupt, 2004
Electronic References, Websites	http://people.revoledu.com/kardi/tutorial/DecisionTree/how-to-usedecision-tree.htm

Course Description Form

46. Course Name: machine learning

47. Course Code: **404COML**

48. Semester / Year: First Semester / 2023-2024

49. Description Preparation Date: 2024

50. Available Attendance Forms: Mandatory attendance

51. Number of Credit Hours (Total) / Number of Units (Total) : 2 hours theoretical + 2 hours practical per week / 3 Units

52. Course administrator's name (mention all, if more than one name)

Name: Prof.Dr. Ziyad Tariq Mustafa Al-Ta'i

Email: Ziyad1964tariq@uodiyala.edu.iq

53. Course Objectives

Teaching the student machine learning methods (the calculator) that depend on inference and prediction of future events through statistical methods, artificial networks and their practical (software) applications aimed at the development of technological innovations.

Teaching and educating students on all the necessary and necessary information related to machine learning, which qualifies them to work and research in all areas of research and prediction methods

54. Teaching and Learning Strategies

Strategy

1- Enable students to solve problems related to the intellectual framework of the scientific research method.

2- Enable students to solve problems in a scientific manner and on a scientific bases

55. Course Structure

Evaluation method	Education method	Unit name and/or topic	Required learning outcomes	hours	Week
Oral or written test	Electronic lecture using Microsoft Editor	Introduction to Machine Learning.		4	1
Oral or written test	Electronic lecture using Microsoft Editor	Machine learning Models		4	2
Oral or written test	Electronic lecture using Microsoft Editor	Find S Algorithm. And List Eliminate Algorithm.		4	3
Oral or written test	Electronic lecture using Microsoft Editor	Candidate Elimination Algorithm.		4	4
Oral or written test	Electronic lecture using Microsoft Editor	Entropy and Information Gain.		4	5
Oral or written test	Electronic lecture using Microsoft Editor	Decision Tree Algorithm with Example.		4	6
Oral or written test	Electronic lecture using Microsoft Editor	Introduction to Neural networks.		4	7
		McCulloch Pitts model.		4	8
Oral or written test	Electronic lecture using Microsoft Editor	Single Neuron Model.		4	9
		Multiple Neurons Model.		4	10

Oral or written test	Electronic lecture using Microsoft Editor	Transfer functions.	4	11
Oral or written test	Electronic lecture using Microsoft Editor	Single layer Model.	4	12
Oral or written test	Electronic lecture using Microsoft Editor	Multiple Layers Model.	4	13
Oral or written test	Electronic lecture using Microsoft Editor	Learning and Adaptation.	4	14
Oral or written test	Electronic lecture using Microsoft Editor	Habbeian Learning Rule. And Perceptron Learning Rule.	4	15
Oral or written test	Electronic lecture using Microsoft Editor	Delta Learning Rule. And Widrow Hoff Learning Rule	4	16

56.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

57.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Machine Learning, Tom Mitchell, McGraw Hill Press, 1997
Main references (sources)	Fundamentals of Neural Networks: Architecture, Algorithms, and applications. By Laurene Fausett, 2010.
Recommended books and references (scientific journals, reports...)	COS 511: Theoretical Machine Learning
Electronic References, Websites	http://www.cs.princeton.edu/courses/archive/spr08/cos511/scribe_notes/0204.pdf

Course Description Form

58.Course Name:					
Mobile Computing					
59.Course Code:					
COM23					
60.Semester / Year:					
2023-2024					
61.Description Preparation Date:					
62.Available Attendance Forms:					
63.Number of Credit Hours (Total) / Number of Units (Total) 3					
64. Course administrator's name (mention all, if more than one name)					
Name: <i>Khalid M.S. Al Zaidi</i>					
Email: dr.khaledmoh@uodiyala.edu.iq					
65.Course Objectives					
Course Objectives	<ul style="list-style-type: none"> • Students taking this course will develop an understanding of the ways that mobile technologies can be used for teaching and learning. They will also consider the impact of mobile computing on the field of education. • To understand concepts of Mobile Communication.(Understand) <ul style="list-style-type: none"> • To analyse next generation Mobile Communication System. (Analyze) • To understand network and transport layers of Mobile Communication.(Understand) • Analyze various protocols of all layers for mobile and ad hoc wireless communication networks. (Analyze) • understand IP and TCP layers of Mobile Communication.(Understand) 				
66.Teaching and Learning Strategies					
Strategy					
67. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction to mobile computing		Lecture Base	

2	3	Limitations of Mobile Computing		Lecture Base	
3	3	Mobile Communication		Lecture Base	
4	3	Mobile Communication The cellular concept: Cellular system	Hexagonal geometry cell and concept of frequency reuse, Channel Assignment Strategies Distance to frequency reuse ratio	Lecture Base	
5	3			Lecture Base	
6	3	Telecommunication System:	GSM: -Channel location, call routing Architecture, PLMN interface, addresses and identifiers, network aspects, frequency allocation, authentication and security, Handoffs Technology. GPRS: network operation, data services, Applications, Billing and charging	Lecture Base	
7	3	Mobile IP:	Overview of Traditional TCP Need of mobile IP, IP packet delivery, Agent Discovery, Registration, Tunnelling and encapsulation, Route optimization, IP Handoff	Lecture Base	
8	3	Mobile Transport Layer:	Overview of Traditional TCP and implications of mobility control. Improvement of TCP: Indirect TCP, Snoop TCP, Mobile TCP, Fast Retransmit/fast recovery, Time-out freezing, Selective retransmission, Transaction-oriented TCP	Lecture Base	
9	3	Wireless Application Protocol:	Introduction of WAP, WAP applications, WAP Architecture, WAP Protocol Stack, Challenges in WAP	Lecture Base	
10	3	Mobile Ad Hoc wireless networks:	Introduction, Benefits, Difference, Routing protocols for ad hoc wireless networks: DSDV and AODV	Lecture Base	
11	3	Introduction to 4G:	Introduction, features and challenges, Applications of 4G, 4G network architecture	Lecture Base	
12	3	Mobile Device Operating Systems		Lecture Base	
13	3	Mobile Operating Systems	Software Development Kit: iOS, Android, BlackBerry, Windows Phon	Lecture Base	
14	3	Mobile Payment System — Security Issues		Lecture Base	
15	2			Lecture Base	

68. Course Evaluation

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc. b. The internal evaluation will be done on the basis of continuous

evaluation of students in the laboratory and class-room. c. Practical examination will be conducted at the end of the semester for evaluation of the performance of students in the laboratory. d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

69. Learning and Teaching Resources

Required textbooks (curricular book any)	Tomasz Imielinski and Henry F. Korth, "MOBILE COMPUTING".
Main references (sources)	<ul style="list-style-type: none"> - Ivan Stojmenovic; "Handbook of Wireless Networks and Mobile Computing". - Martyn Mallick; "Mobile and Wireless Design Essentials ". <ul style="list-style-type: none"> • Behrouz A. Forouzan; "Data Communication and networking".
Electronic References, Websites	<ul style="list-style-type: none"> - https://www.udemy.com http://www.protocols.com/ 3. https://developer.apple.com/ 4. https://www.udemy.com 5. http://nptel.ac.in

Course Description Form

70. Course Name:
Modeling and Simulation
71. Course Code:
OPT50
72. Semester / Year:
2023-2024
73. Description Preparation Date:
74. Available Attendance Forms:
75. Number of Credit Hours (Total) / Number of Units (Total) 3
76. Course administrator's name (mention all, if more than one name)
Name: Jamal Mustafa Abbas Email: dr.altuwaijari@uodiyala.edu.iq

77. Course Objectives

Course Objectives	<ul style="list-style-type: none"> This course provides an introduction to the process of designing model existing or proposed real-world systems, and how to use the models perform simulations that allow for predictions about the future behavior the system. The system could be something as mundane as a cricket match to something more complex, such as a communication network, transportation system. Most systems of interest will require development of one or more statistical models. Thus, modeling simulation has a significant overlap with probability and statistics. course topics will include a review of concepts from probability statistics that are relevant to modeling and simulation, algorithms random-variable sampling, modeling and analysis of basic queue systems, variance-reduction techniques, statistical-validation techniques Independent Monte Carlo (IMC) and Markov-Chain Monte Carlo (MCMC) simulations, and discrete-event modeling and simulation. Program assignments will be provided throughout the semester. In addition, each student will complete an end-of-term project that centers on the modeling and simulation of a system of interest.
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78. Teaching and Learning Strategies

Strategy	The goal of this course is to enable the student to design, develop, implement, and analyze simulation models, and to have comprehensive of important aspects of simulation study including modeling, simulation software, model verification and validation, random number generation variates, and analysis of simulation experiment and applications.
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79. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Flowchart for departure event routine		Lecture Base	
2	3	SIMULATION PROGRAMMING		Lecture Base	
3	3	Arrival and departure event function		Lecture Base	
4	3	Arrival and departure event function Memory protection		Lecture Base	
5	3			Lecture Base	
6	3	Arrival and departure event function		Lecture Base	
7	3	Exponential, Poisson, normal, uniform, and Binomial distribution.		Lecture Base	
8	3	RANDOM NUMBER GENERATION		Lecture Base	
9	3	Chi-square test and K-S test basis		Lecture Base	
10	3	<ul style="list-style-type: none"> Markov-Chain Monte Carlo methods 		Lecture Base	

11	3	<ul style="list-style-type: none"> • Simulated annealing 		Lecture Base	
12	3	<ul style="list-style-type: none"> • Statistical analysis of simulated data 		Lecture Base	
13	3	<ul style="list-style-type: none"> • Statistical validation techniques 		Lecture Base	
14	3	Queuing Theory		Lecture Base	
15	2			Lecture Base	

80.Course Evaluation

The course is an introduction to modeling and simulation. It includes the following topics: Fundamental concepts of computer simulation; Models for computer simulation; Random numbers: pseudorandom number generation and testing, Monte Carlo methods; Introduction to distribution functions; Simulation modeling; Discrete-event simulation; Continuous simulation; Verification and validation of simulation models; Input analysis; Output analysis; Queuing theory models; Design code; Test and Debug simulation programs; Sample of applications. There will be weekly practice in the lab.

81.Learning and Teaching Resources

Required textbooks (curricular books if any)	Simulation Modeling and Analysis , 5/e, by Averil M Law and W. David Kelton, McGraw Hill, 2015. www.mhhe.com/engcs/industrial/lawkelton 2-Tayfur Altiok and Benjamin Melamed, Simulation Modeling and Analysis with Arena, edition 2007/ or the latest.
Main references (sources)	<ul style="list-style-type: none"> • Simulation Modeling and Analysis , 5/e, by Averil M Law and W. David Kelton, McGraw Hill, 2015. www.mhhe.com/engcs/industrial/lawkelton 2- Tayfur Altiok and Benjamin Melamed, Simulation Modeling and Analysis with Arena, edition 2007/ or the latest.
Electronic References, Websites	http://www2.mansfield.edu/mathematics/program-course-goals-objectives-and-outcomes/index.cfm

Course Description Form

82.Course Name:	
Multimedia	
83.Course Code:	
COM10	
84.Semester / Year:	
first/2023-2024	
85.Description Preparation Date:	
1/5/2024	
86.Available Attendance Forms:	
Presence	
87.Number of Credit Hours (Total) / Number of Units (Total)	
30/3	
88. Course administrator's name (mention all, if more than one name)	
Name: Muna Rashid Hameed Email: munarashid@uodiyala.edu.iq	
89.Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • This course aims to introduce the fundamental elements of multimedia. It will provide an understanding of the fundamental elements in multimedia. The emphasis will be on learning the representations, perceptions and applications of multimedia. Software skills and hands on work on digital media will also be emphasized. On completion of the subject, the students will understand the technologies behind multimedia applications and master the skills for developing multimedia projects. After successfully completing the module

student should be able to:

- Summarize the key concepts in current multimedia technology.
- Create quality multimedia software titles.

90. Teaching and Learning Strategies

Strategy

- students will have developed a comprehensive understanding of the principles and techniques involved in creating and analyzing multimedia content. They will be equipped with the knowledge and skills to effectively utilize multimedia tools and technologies to communicate ideas, information, and stories across various digital platforms.
- Students will demonstrate proficiency in designing, producing, and evaluating multimedia projects, incorporating elements such as text, images, audio, video, and interactive elements. Additionally, they will have cultivated critical thinking, problem-solving, and creativity in the context of multimedia production, enabling them to adapt to evolving technologies and effectively engage diverse audiences in today's digital landscape.

91. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3		An Introduction to MULTIMEDIA	Electronic lect using Micros Editor	Oral or written test
2	3		Multimedia Software Tools	Electronic lect using Micros Editor	Oral or written test
3	3		Overview of Multimedia Software Tools	Electronic lect using Micros Editor	Oral or written test
4	3		Multimedia Production	Electronic lect using Micros Editor	Oral or written test
5	3		Multimedia Production	Electronic lect using Micros Editor	Oral or written test
6	3		Graphics/Image Data Types	Electronic lect using Micros Editor	Oral or written test
7	3		Gamma Correction	Electronic lect using Micros Editor	Oral or written test

8	3		Color Models in Video	Electronic lect using Micros Editor	Oral or written test
9	3		Chroma Subsampling	Electronic lect using Micros Editor	Oral or written test
10	3		Audio Digitization	Electronic lect using Micros Editor	Oral or written test
11	3		Audio Filtering	Electronic lect using Micros Editor	Oral or written test
12	3		Quantization and Transmission of Audio	Electronic lect using Micros Editor	Oral or written test
13	3		Color Histogram	Electronic lect using Micros Editor	Oral or written test
14	3		Texture Layout	Electronic lect using Micros Editor	Oral or written test
15	3		Image Retrieving	Electronic lect using Micros Editor	Oral or written test

92.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc

93.Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

- "Fundamentals of Multimedia", by Ze-N Li, Mark S Drew, Published by Prentice Hall 2004

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

1. W. K. Pratt ,Digital Image Processing, Second Ed. Wiley, (1991).
2. Gonzalez "Digital image processing" ,2008.
D.Philips, "image processing in c language", second edition, April 2000.

Course Description Form

94.Course Name: Network Security

95.Course Code: **OPT53**

96.Semester / Year: Semester

97.Description Preparation Date: 2024

98.Available Attendance Forms: Mandatory attendance

99.Number of Credit Hours (Total) / Number of Units (Total) : 3 hours theoretical + per week / 3 Units

100. Course administrator's name (mention all, if more than one name)

Name: Dr. Burhan Molan saleh

Email:

101. Course Objectives

Network Security Fundamentals is a basic course in network security. The student will learn the key elements of network security scientifically and internet security specifically, such as potential attack types, as well as types and methods of web protection, various algorithms, and protocols used in network security, and what session security entails. The curriculum aims to:

- 1- The desired goal for the student to successfully pass the course requirements is for the student to understand the principles of network security and the importance of using them over the internet, in addition to the applied fields in which this field is involved.
- 2- The student's understanding of the types and methods of research.
- 3- Developing the student's ability to use available software in this field in addition to the skills acquired in programming and encryption.

102. Teaching and Learning Strategies

Strategy

- 1- Enable students to solve problems related to the intellectual framework of the scientific research method.
- 2- Enable students to solve problems in a scientific manner and on scientific bases

103.Course Structure

Evaluation method	Education method	Unit name and/or topic	Required learning outcomes	hours	Week
Oral or written test	Electronic lecture using Microsoft Editor	the basics of the Internet security		4	1
Oral or written test	Electronic lecture using Microsoft Editor	exploring the attacks techniques that can be used by attackers		4	2
Oral or written test	Electronic lecture using Microsoft Editor	the ways of defense.		4	3
Oral or written test	Electronic lecture using Microsoft Editor	Control hijacking attacks		4	4
Oral or written test	Electronic lecture using Microsoft Editor	Exploitation techniques and fuzzing;		4	5
Oral or written test	Electronic lecture using Microsoft Editor	Secure system design		4	6
		access control.		4	7
		protection Tools for writing robust application code		4	8
				4	9

Oral or written	Electronic lecture using	web security models			
		User authentication		4	10
Oral or written test	Electronic lecture using Microsoft Editor	session management		4	11
Oral or written test	Electronic lecture using Microsoft Editor	Cross-Site Attacks; SQL Injection Attacks;		4	12
Oral or written test	Electronic lecture using Microsoft Editor	What is SSL;		4	13
Oral or written test	Electronic lecture using Microsoft Editor	What is HTTPS, how it works, its pitfalls;.		4	14
Oral or written test	Electronic lecture using Microsoft Editor	What is certificates, where it can be used and how can created;		4	15
Oral or written test	Electronic lecture using Microsoft Editor	Delta Learning Rule. And Widrow Hoff Learning Rule		4	16

104. Course Evaluation

- Practical exams
- 2- Theoretical exams
 - 3- Reports and studies
 - 4- Daily quizzes with self-solvable questions
 - 5- Grades determined by homework assignments

105. Learning and Teaching Resources

Cryptography and network security, 5th 1 - Edition, William Stallings, 2011

Machine Learning, Tom Mitchell, McGraw Press, 1997

Network Security and Management. PHI Learning Pvt. Ltd., 2011.

Fundamentals of Neural Networks: Architecture, Algorithms, and application By Laurene Fausett, 2010.

***Guide to computer network security.* Heidelberg, Germany: Springer, 2013.**

COS 511: Theoretical Machine Learning

https://www.cisco.com/c/ar_ae/products/security/what-is-cybersecurity.html

http://www.cs.princeton.edu/courses/archive/spr08/cos511/scribe_notes/0204.pdf

Course Description Form

1. Course Name: Operating System- First Semester	
2. Course Code:	
3. Semester / Year: First Semester / 2023-2024	
4. Description Preparation Date: 2024	
5. Available Attendance Forms: Mandatory attendance	
6. Number of Credit Hours (Total) / Number of Units (Total): 2 theoretical hours - 2 practical hours / a week - 3 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Prof.Dr. Jamal Mustafa Abbas Al-Tuwaijari Email: dr.altuwaijari@uodiyala.edu.iq	
8. Course Objectives	
<p>Course Objectives This academic curriculum is prepared to introduce the student to operating systems, their definition, structure, development, and tasks. The course addresses the structure of operating systems and the role of operating systems, operating system structure, processes and their synchronization, task scheduling, main memory and virtual memory management. The curriculum aims to:</p>	<ol style="list-style-type: none"> 1. Prepare the student to understand the basic concepts of operating systems and their applications. 2. Providing students with basic knowledge of the structure of operating systems, which includes the hardware and software components of the computer. 3. Improving the student's level and providing her/him with the scientific skills and abilities to understand methods for managing the main memory of the computer as well as the case for virtual memory and temporary memory. 4. Developing the student's ability to use software and applications available in the field of computers that are compatible with the operating systems used in the computer, in addition to the skills in using central processing unit management software. 5. Enabling the student to understand information management software (file system) as well as deal with problems related to processors and operations.
9. Teaching and Learning Strategies	
Strategy	<ol style="list-style-type: none"> 1. Building students' basic knowledge about operating systems, their principles, basic concepts, and types. 2. Enabling students to acquire mental, cognitive, analytical and understanding skills in the field of operating systems.

	3. Enabling students to solve problems related to the intellectual framework of operating systems management
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10. Course Structure	
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Evaluation method	Education method	Unit name and/or topic	Required learning outcomes	hours	Week
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Introduction ,Role and purpose of the operating system	Definitions and a general introduction to operating systems, during which the notes and instructions that students must adhere to in order to achieve the best performance in studying the subject are explained.	2	1
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	History and types of operating system, Operating system development	History and types of operating system	2	2
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Functionality of a typical operating system	Functionality of operating system	2	3
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Computer System, Operating System Components and structure	Operating System Components	2	4
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Performance and Development of operating system	Development of operating system	2	5
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	operating system functions and services	operating system functions	2	6
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Processes, process concepts, operation on processes	Processes	2	7
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Interrupts: methods and implementations	Interrupts	3	8
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Concept of user/system state and protection, transition to kernel mode	Concept of user/system	2	9

Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Concurrency Context switching Program status words (PSWs)	Concurrency Context switching Program status words (PSWs)	2	10
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Threads, Thread structure	Threads and Thread structure	2	11
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Scheduling and policies, Scheduling levels	Scheduling and Scheduling levels	2	12
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Dispatcher Scheduling criteria	Dispatcher Scheduling criteria	2	13
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Preemptive and non-preemptiv scheduling	Preemptive and non-preemptiv scheduling	2	14
Daily exams and homework, in addition to monthly exams	Electronic lecture using Microsoft Editor	Scheduling Algorithms	Scheduling algorithms	2	15

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc, in addition to practical exams.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Not available
Main references (sources)	Operating System Concepts. By Silberschtz and Galvin
Recommended books and references (scientific journals, reports...)	Operating Systems, by Harvey M. Deitel, Paul J. Deitel, and David R. Choffnes
Electronic References, Websites	http://www.deitel.com/Books/OperatingSystems/

Course Description Form

106. Course Name:					
Data mining					
107. Course Code:					
108. Semester / Year:					
2023-2024					
109. Description Preparation Date:					
110. Available Attendance Forms:					
111. Number of Credit Hours (Total) / Number of Units (Total) 2					
112. Course administrator's name (mention all, if more than one name)					
Asst.Prof.Dr. Muntadher khamees Email: alkarawis@uodiyala.edu.iq					
113. Course Objectives					
Course Objectives		This course introduces basic concepts, tasks, methods, and techniques in Data Mining. The emphasis is on various Data Mining problems and their solutions. Students will develop an understanding of the Data Mining and issues, learn various techniques in Data Mining, and apply the techniques in solving Data Mining problems using tools and systems. Students will also be exposed to a sample of Data Mining applications.			
114. Teaching and Learning Strategies					
Strategy		data is stored, analyzed, and disseminated via data mining , a interdisciplinary field consisting of both data mining and computer science. An application of data mining is to determine the function of genes and proteins, to establish evolutionary relationships, and to calculate the high dimensional shape of proteins by using computer programs.			
115. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction	Chap.1 Ref. 1	Lecture Base	
2	3	Data	Chap.2 Ref. 1, Chap.2, Ref 5.	Lecture Base	
3	3	Data Preprocessing I	Ch.7, Ref. 5, Chap.2 Ref. 1, Chap.2 Ref. 6	Lecture Base	
4	3	Data Preprocessing II Data Visualization	Ch.7, Ref. 5, Chap.2 Ref. 1, Chap.2 Ref. 6	Lecture Base	
5	3			Lecture Base	
6	3	Classification I: Basic Concepts, Decision Trees, and Model Evaluation	Chap.3 Ref.1 Chap.4 Ref.1	Lecture Base	
7	3	Classification II : Alternative Techniques	Chap.4,5 Ref.1	Lecture Base	

8	3	Clustering: Basic concepts	Chap.8 Ref.1	Lecture Base	
9	3	Clustering Algorithms I: Sequential algorithms, Hierarchical algorithms	Chap.8,9 Ref.1	Lecture Base	
10	3	Regression Analysis		Lecture Base	
11	3	Mining Frequent Patterns, Associations, and Correlations I	Chap.6 Ref.1	Lecture Base	
12	3	Mining Frequent Patterns, Associations, and Correlations II	Chap.6 Ref.1	Lecture Base	
13	3	Advance Topics		Lecture Base	
14	3	Review		Lecture Base	
15	2	First Exam	Exam 2	Lecture Base	
116. Course Evaluation					
<p>The course serves as an introduction to data mining and applications . The aim is that students should understand how data mining can be applied and evaluated and provide tools for practical approaches to mining algorithm</p>					
117. Learning and Teaching Resources					
Required textbooks (curricular books, any)		. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques” Third Edition, Elsevier, 2012.			
Main references (sources)		<ol style="list-style-type: none"> 1- . Pang-Ning Tan, Michael Steinbach, Vipin Kumar, “Introduction to data mining,” 2006. 2- Jiawei Han, Micheline Kamber, “Data Mining: Concepts and Techniques,” Second Edition, Elsevier Inc., 2006. 3- Anil K. Jain, Richard C. Dubes, “Algorithms for Clustering Data,” Prentice-Hall Inc., 1988. 4- David Hand, Heikki Mannila, Padhraic Smyth, “Principles of Data Mining,”The MIT Press, 2001. 5- Ian H. Witten, Eibe Frank, “Data Mining, Practical Machine Learning Tools and Techniques,” Morgan Kaufmann Publishers, 2005. 6- Daniel T. Larose, “Discovery Knowledge in Data, An Introduction to Data Mining,” A John Wiley & Sons, Inc., Publication, 2005. 7- Further Readings are also preferable. 			
Electronic References, Websites		<ol style="list-style-type: none"> 1. https://www.coursera.org/lecture/code-free-data-science/introduction-to-data-mining-hbb2V 2. https://onlinecourses.swayam2.ac.in/cec19_cs01/preview material 			

Course Description Form

118.	Course Name: Web Design
119.	Course Code: OPT45
120.	Semester / Year: Second Semester / 2023-2024
121.	Description Preparation Date: 2024
122.	Available Attendance Forms: Mandatory attendance
123.	Number of Credit Hours (Total) / 2 hours theoretical per week / 3 Units
124.	Course administrator's name (mention all, if more than one name)

Name: Assist. Prof. Dr. Dheyab Salman Ibrahim Al-nedawy
Email: dr.dheyab@uodiyala.edu.iq

125. Course Objectives

Teaching the student web design technologies such as HTML, CSS, and JavaScript in order to create different HTML documents and teaching the students to build website.
Teaching and educating students on all the necessary and necessary information related to design techniques, which qualifies them to work and research in all areas of research.

126. Teaching and Learning Strategies

Strategy	<ol style="list-style-type: none">1- Enable students to create web pages based on HTML tags.2- Teach students to format these web pages based on CSS rules.3- Teach students to increase the inactive these web pages based on JavaScript language.
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10. Course Structure

Evaluation method	Education method	Unit name and/or topic	Required learning outcomes	hours	Week
Oral or written test	Electronic lecture using Microsoft Editor	Introduction to a Computer Networks		2	1
Oral or written test	Electronic lecture using Microsoft Editor	Internet and Web: Overview		2	2
Oral or written test	Electronic lecture using Microsoft Editor	Web Design Technologies		2	3
Oral or written test	Electronic lecture using Microsoft Editor	HTML Tags		2	4
Oral or written test	Electronic lecture using Microsoft Editor	HTML Links		2	5
Oral or written test	Electronic lecture using Microsoft Editor	HTML Lists		2	6
Oral or written test	Electronic lecture using Microsoft Editor	HTML Tables		2	7
Oral or written test	Electronic lecture using Microsoft Editor	HTML Forms		2	8
Oral or written test	Electronic lecture using Microsoft Editor	CSS Rules		2	9
Oral or written test	Electronic lecture using Microsoft Editor	CSS – Selectors		2	10
Oral or written test	Electronic lecture using Microsoft Editor	CSS – Inclusion: Inline, Internal ways		2	11
Oral or written test	Electronic lecture using Microsoft Editor	CSS – Inclusion: External way		2	12

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc.

12. Learning and Teaching Resources

Required textbooks (curricular books any)	How the Internet Works, Preston Gralla, Pearson Education, Eighth Edition.
Main references (sources)	Internet for Everyone, Alexis Leon, S. Chand (G/L) & Company Ltd; Second - .Edition
Recommended books and references (scientific journals, reports...)	Web Design with HTML and CSS Digital Classroom. https://bawar.net/data0/books/5d626a582939a/pdf/web-design-with-html-and-css-digital-classroom.pdf
Electronic References, Websites	Learning Web Design Fourth Edition A Beginner's Guide to HTML, CSS, JavaScript and Web Graphics. https://wtf.tw/ref/robbins.pdf

Course Description Form

1. Course Name:

Research methodology

2. Course Code:

COM-316

3. Semester / Year:					
Second semester/third year					
4. Description Preparation Date:					
4/4/2024					
5. Available Attendance Forms:					
4/4/2024					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours/1units					
7. Course administrator's name (mention all, if more than one name)					
Name: layla abd al.haq esmaeel Email: laylaaeabdalhaq@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives		<p>1. The objective required of the student in order to successfully pass the requirements of the course is the student's awareness of the importance of scientific research and scientific methods. used in carrying out research and auxiliary programs.</p> <p>2. The student's awareness of the types of scientific research and each specialization has a method in scientific research.</p> <p>3. Develop the student's ability in scientific research and teach him the basics of scientific research and the ethics of scientific research.</p>			
9. Teaching and Learning Strategies					
Strategy		<ul style="list-style-type: none"> - Using various modern presentation tools - the lecture method and the use of the interactive whiteboard - providing students with the basics and additional topics related to scientific research - Forming discussion groups during the lectures to discuss modern systems that require - thinking and analysis Asking the students a set of thinking questions during the lectures such as what, how, when and why For specific topics - giving students homework that requires subjective explanations in causal ways 			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Definitions and a general introduction Explanation of the necessary notes and instructions The students and the professor are obligated To achieve the best		Electronic Lecture using editor Microsoft	Oral written t

		performance from studying the subject			
2	3	Meaning Of Research		Electronic Lecture using editor Microsoft	Oral written t
3	3	General CharacteristicOf Research		Electronic Lecture using editor Microsoft	Oral written t
4	3	Types Of Research		Electronic Lecture using editor Microsoft	Oral written t
5	3	Research Problem		Electronic Lecture using editor Microsoft	Oral written t
6	3	Problem Formulation		Electronic Lecture using editor Microsoft	Oral written t
7	3	High Impact ResearchTools		Electronic Lecture using editor Microsoft	Oral written t
8	3	Project Planning		Electronic Lecture using editor Microsoft	Oral written t
9	3	Gantt Chart		Electronic Lecture using editor Microsoft	Oral written t
10	3	Research <i>Ethics</i>		Electronic Lecture using editor Microsoft	Oral written t
11	3	Writing the LiteratureReview		Electronic Lecture using editor Microsoft	Oral written t
12	3	Citation ManagementTools		Electronic Lecture using editor Microsoft	Oral or written t
13	3	Methods of DataCollection		Electronic Lecture using editor Microsoft	Oral or written t
14	3	Research Report		Electronic Lecture using editor Microsoft	Oral or written t
15	3	General Format of Rese Report		Electronic Lecture using editor Microsoft	Oral or written t
11.Course Evaluation					

- Practical tests 2- Theoretical tests 3- Reports and studies 4- Daily exams with self- solving questions 5- Marks specific to homework	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	* Research Methodology a step-by-step guide for beginners, Ranjit Kumar, 3rd edition, 2011.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	1- Research Methodology - Methods and Techniques, C.R. Kothari, 3rd edition, 2004. 2- Fundamental of Research Methodology and Statistics, Yogesh Kumar Singh, 2006. 3- How to do the Final Year Projects A practical Guideline for Computer Science and IT Student Hossein Hassani, 2012.

Course Description Form

127.	Course Name:	compiler
128.	Course Code:	301COLT2
129.	Semester / Year:	2023-2024
130.	Description Preparation Date:	15/4/2024
131.	Available Attendance Forms:	Presence
132.	Number of Credit Hours (Total) / Number of Units (Total)	60
133.	Course administrator's name (mention all, if more than one name)	

Name: **Wasan ahmed ali**
 Email: **wasanahmed83@gmail.com**

134. Course Objectives

Course Objectives	<p>Introducing the student to the six basic stages of the compiler and how each stage works to understand how to convert basic code into a computer program.</p> <p>A- Cognitive objectives</p> <ol style="list-style-type: none"> 1- Definition of the program code 2- Using the code to serve the system 3- Defining the important steps in designing the code 4- Identify the types of errors that may occur during design <p>B- The skills objectives of the course</p> <ol style="list-style-type: none"> 1- Knowledge skills - remembering 2- Memorization and analysis skills 3- Use and development skills
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135. Teaching and Learning Strategies

Strategy	<p>The main strategy that will be adopted in delivering the Language Translator module is to engage students actively in practical exercises to enhance their understanding and develop their critical thinking skills.</p> <p>To enhance learning and encourage active participation, interactive lessons will be conducted. These tutorials will include practical exercises where students will work on applying all the methods used in the compiler and all algorithms of the parser as programs in one of the developed programming languages. This hands-on approach will help students understand the practical implications of theoretical concepts discussed in the classroom.</p> <p>Overall, the unit delivery approach aims to actively engage students, improve their critical thinking skills, and provide them with hands-on experiences in image processing and a language interpreter. By combining theoretical knowledge with practical activities, students will develop a deeper understanding of language compiler concepts and their applications in various fields.</p>
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136. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Shift-Reduce Parsing	In-person lecture using computer, display screen, pen and blackboard	Oral or written tes

2	2		Handles	In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
3	2		Stack Implementation of Shift-Reduce Parsing	In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
4	2		Operator-Precedence Par (OPP) Table Construction of Operator-Precedence Relations	In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
5	2			In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
6	2		Relations of Operator-Precedence Table	In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
7	2		LR parser	In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
8	2		SLR Parser	In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
9	2		Canonical LR Parser LALR Parser	In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
10	2		Conflict types	In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
11	2				In-person lecture using computer, display screen, pen blackboard	u
12	2		Shift - Reduce Conflict Reduce - Reduce Conflict	In-person lecture using computer, display screen, pen blackboard	u	Oral or written tes
13	2				In-person lecture using computer, display screen, pen blackboard	u
14	2		Semantic Errors	blackboard		Oral or written tes
15	2					

137. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc

138. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Compiler principles and tools
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

139.	Course Name:
	compiler
140.	Course Code:
	301COLT1
141.	Semester / Year:
	2023-2024
142.	Description Preparation Date:
	15/4/2024
143.	Available Attendance Forms:
	Presence
144.	Number of Credit Hours (Total) / Number of Units (Total)
	60
145.	Course administrator's name (mention all, if more than one name)
	Name: Wasan ahmed ali Email: wasanahmed83@gmail.com
146.	Course Objectives

Course Objectives	<p>Introducing the student to the six basic stages of the compiler and how each stage works to understand how to convert basic code into a computer program.</p> <p>A- Cognitive objectives</p> <ol style="list-style-type: none"> 1- Definition of the program code 2- Using the code to serve the system 3- Defining the important steps in designing the code 4- Identify the types of errors that may occur during design <p>B- The skills objectives of the course</p> <ol style="list-style-type: none"> 1- Knowledge skills - remembering 2- Memorization and analysis skills 3- Use and development skills
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147. Teaching and Learning Strategies

Strategy	<p>The main strategy that will be adopted in delivering the Language Translator module is to engage students actively in practical exercises to enhance their understanding and develop their critical thinking skills.</p> <p>To enhance learning and encourage active participation, interactive lessons will be conducted. These tutorials will include practical exercises where students will work on applying all the methods used in the compiler and all algorithms of the parser as programs in one of the developed programming languages. This hands-on approach will help students understand the practical implications of theoretical concepts discussed in the classroom.</p> <p>Overall, the unit delivery approach aims to actively engage students, improve their critical thinking skills, and provide them with hands-on experiences in image processing and a language interpreter. By combining theoretical knowledge with practical activities, students will develop a deeper understanding of language compiler concepts and their applications in various fields.</p>
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148. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
16	2		Introduction	In-person lecture using computer, display screen, pen and blackboard	Oral or written tes
17	2		Programming Languages	In-person lecture u computer, display screen, pen blackboard	Oral or written tes
18	2		The Analysis -Synthesis mo of compilation	In-person lecture u computer, display screen, pen blackboard	Oral or written tes

19	2		Phases of a Compiler	In-person lecture computer,display screen, pen blackboard	u	Oral or written tes
20	2			In-person lecture computer,display screen, pen blackboard	u	Oral or written tes
21	2		Compiler structure	In-person lecture computer,display screen, pen blackboard	u	Oral or written tes
22	2		lexical analysis	In-person lecture computer,display screen, pen blackboard	u	Oral or written tes
23	2		Tokens, Patterns, Lexemes	In-person lecture computer,display screen, pen blackboard	u	Oral or written tes
24	2		Symbol Table Lexical errors	In-person lecture computer,display screen, pen blackboard	u	Oral or written tes
25	2			In-person lecture computer,display screen, pen blackboard	u	Oral or written tes
26	2		A simple approach to the design of lexical analysis	In-person lecture computer,display screen, pen blackboard	u	Oral or written tes
27	2		Regular Definitions Finite Automata (FA)	In-person lecture using compu display screen, pen blackboard	u	Oral or written tes
28	2		Syntax Analysis	In-person lecture using compu display screen, pen blackboard	u	Oral or written tes
29	2					Oral or written tes
30	2					Oral or written tes

149. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc

150. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Compiler principles and tools
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

151.	Course Name:	Artificial Intelligence
152.	Course Code:	COM-122
153.	Semester / Year:	2023-2024
154.	Description Preparation Date:	
155.	Available Attendance Forms:	
156.	Number of Credit Hours (Total) / Number of Units (Total)	
157.	Course administrator's name (mention all, if more than one name)	Name: Dr.Adil Abdulwahhab Al-Azzawi Email: adil_alazzawi@updiyal.edu.iq
158.	Course Objectives	
Course Objectives		<ul style="list-style-type: none"> • The course begins by describing what the latest generation of artificial intelligence techniques can do. After an introduction to some basic concepts and techniques, the course illustrates both the potential and current limitations of these techniques with examples from a variety of applications. We spend some time on understanding the strengths and weaknesses of human decision-making and learning, specifically in combination with AI systems. Exercises will include hands-on application of basic AI techniques as well as selection of appropriate technologies for a given

problem and anticipation of design implications. In a final project, group students will participate in the creation of an AI-based application.

159. Teaching and Learning Strategies

Strategy	The course begins by describing what the latest generation of artificial intelligence techniques can do. After an introduction to some basic concepts and techniques, course illustrates both the potential and current limitations of these techniques with examples from a variety of applications. We spend some time on understanding strengths and weaknesses of human decision-making and learning, specifically combination with AI systems and on ethical and policy implications of new AI capabilities. Exercises will include hands-on application of basic AI techniques as well as selection of appropriate technologies for a given problem and anticipation of design implications. In a final project, groups of students will participate in the creation of an AI-based application.
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160. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge Representation	Introduction to artificial intelligence	Lecture Base	
2	2		Problem solving in A.I	Lecture Base	
3	2		Problem solving in A.I (cont.)	Lecture Base	
4	2		Importance of search for AI	Lecture Base	
5	2		Uninformed and informed search	Lecture Base	
6	2		Adversarial search	Lecture Base	
7	2		Mid-term Exam	Lecture Base	
8	2	Apply selected basic AI techniques, judge applicability of more advanced techniques.	Local search (gradient descent)	Lecture Base	
9	2		Reasoning with Uncertainty	Lecture Base	
10	2		Bayesian networks	Lecture Base	
11	2	Participate in the design of systems that act intelligently and learn from experience.	Robotic control and planning	Lecture Base	
12	2		Robotic control and planning (cont.)	Lecture Base	
13	2		Knowledge Representation	Lecture Base	
14	2		Knowledge Representation	Lecture Base	
15	2		Final Exam Review	Lecture Base	

161. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

162. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Russell & Norvig, Chapter 1, "Introduction" Artificial Intelligence: A Modern Approach, 2020
Main references (sources)	Adversarial Search" in Russell & Norvig, Artificial Intelligence: A Modern Approach, 2020
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

163.	Course Name:
	Pattern Recognition
164.	Course Code:
	COM-326
165.	Semester / Year:
	2023-2024
166.	Description Preparation Date:

167. Available Attendance Forms:					
168. Number of Credit Hours (Total) / Number of Units (Total)					
169. Course administrator's name (mention all, if more than one name)					
Name: Dr.Adil Abdulwahhab Al-Azzawi Email: adil_alazzawi@updiyala.edu.iq					
170. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> • Understand the basic concepts and principles of pattern recognition including feature extraction, classification, and clustering. • Apply various pattern recognition algorithms and techniques, including supervised and unsupervised learning methods, to solve real-world problems. • Analyze and evaluate the performance of pattern recognition systems using appropriate metrics and evaluation methods. • Gain practical experience in implementing pattern recognition algorithms using programming languages such as Python or MATLAB. • Explore advanced topics in pattern recognition, such as deep learning, probabilistic graphical models, and ensemble methods. • Apply pattern recognition techniques to different domains, including image processing, natural language processing, and bioinformatics. • Develop critical thinking and problem-solving skills through hands-on projects, assignments, and case studies. • Understand the ethical and societal implications of pattern recognition technologies, including privacy concerns and bias in decision-making systems. 			
171. Teaching and Learning Strategies					
Strategy		Pattern recognition theory and practice is concerned with the design, analysis, and development of methods for the classification or description of patterns, objects, signals, and processes. At the heart of this discipline is our ability to infer the statistical behavior of data from limited data sets, and to assign data to classes based on generalized notions of distances in a probabilistic space. Many commercial applications of pattern recognition exist today, including voice recognition (e.g., Amazon Alexa), fingerprint classification (e.g., MacBook Pro touch bar), and retinal scanners (e.g., your favorite cheesy sci-fi movie).			
172. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understands basic structure of pattern recognition systems.	Introduction: An Overview of Machine Learning	Lecture Base	
2	2		Decision Theory: Bayes Rule	Lecture Base	
3	2		Decision Theory: Gaussian Classifiers	Lecture Base	

4	2	Expresses principal units within a pattern recognition system.	Decision Theory: Generalized Gaussian Classifiers	Lecture Base	
5	2	Summarizes execution of a pattern recognition system.	Parameter Estimation: The Bayesian Approach	Lecture Base	
6	2		Mid-term Exam	Lecture Base	
7	2		Decision Theory: Discriminant Analysis	Lecture Base	
8	2		Parameter Estimation: The Expectation Maximization Theorem	Lecture Base	
9	2	Defines the relationship between pattern and feature.	Parameter Estimation: Discriminative Training	Lecture Base	
10	2		Experimental Design: Foundations of Machine Learning	Lecture Base	
11	2	Explains supervised and unsupervised pattern recognition approaches.	Experimental Design: Evaluation	Lecture Base	
12	2		Statistical Significance	Lecture Base	
13	2	Analyzes the success of a feature recognition system.	Jackknifing, Bootstrapping and Combining Classifiers	Lecture Base	
14	2		Introduction to Nonparametric Techniques	Lecture Base	
15	2		Final Exam Review	Lecture Base	

173. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc

174. Learning and Teaching Resources

Required textbooks (curricular books, if any)	A. Lindholm, N. Wahlstrom, F. Lindsten and T. Schon, Machine Learning: A First Course for Engineering and Scientists, Cambridge University Press, New York, New York, USA, ISBN: 978-1-108-84360-7, pp. 338, 2022. URL: http://smlbook.org/book/sml-book-draft-latest.pdf
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Main references (sources)	C.M. Bishop, Pattern Recognition and Machine Learning, Springer, ISBN: 978-0387310732, 2003.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
	Public Administration
2. Course Code:	

OTP9	
3. Semester / Year:	
First/2023	
4. Description Preparation Date:	
15/4/2024	
5. Available Attendance Forms:	
Presence	
6. Number of Credit Hours (Total) / Number of Units (Total)	
15	
7. Course administrator's name (mention all, if more than one name)	
Name: Samah Jalil Saba Email: samahjalil@uodiyala.eud.iq	
8. Course Objectives	
Course Objectives	A- Cognitive objectives A- 1 The student knows public administratic A-2 The student enumerates the types management A-3 The student understands each type management A-4 The student distinguishes betw administrative jobs B - The program's skill objectives B- 1 Knowledge and remembering skills B- 2 Memorization and analysis skills B- 3 Skills for use and development
9. Teaching and Learning Strategies	
Strategy	<p>Some common strategies that may be helpful include:</p> <p>Class interaction: Using interactive methods in class such as group discussions, practical case solving, and collaborative activities. This enhances interaction between students and contributes to a deeper understanding of the topics.</p> <p>Use of technology: Adopting technology in education such as using the Internet, multimedia, and online educational platforms. These tools can be useful to enhance understanding and stimulate participation.</p> <p>Practical lessons: Organize field visits, or invite guest speakers from industry to share their experiences and knowledge in the field of public administration.</p>

Promote Critical Thinking: Encourage students to think critically by asking open-ended questions, analyzing cases, and providing creative solutions to management problems.

Diversifying assessment methods: Using a variety of assessment methods, such as tests, individual work, group projects, and discussions, to evaluate various aspects of student learning

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1		Introduction to public administration	Electronic using Microsoft Ed lec	Oral or written tes
2	1		Management principles	Electronic using Microsoft Ed lec	Oral or written tes
3	1		Management jobs	Electronic using Microsoft Ed lec	Oral or written tes
4	1		Areas of management	Electronic using Microsoft Ed lec	Oral or written tes
5	1		Project management	Electronic using Microsoft Ed lec	Oral or written tes
6	1		Administrative leadership	Electronic using Microsoft Ed lec	Oral or written tes
7	1		Technology Communications Management	Electronic using Microsoft Ed lec	Oral or written test
8	1		Midterm exam	Electronic using Microsoft Ed lec	Oral or written test
9	1		Management ethic	Electronic using Microsoft Ed lec	Oral or written test
10	1		Criteria For Success and Failure Enterprise Management	Electronic using Microsoft Ed lec	Oral or written test
11	1			Electronic using Microsoft Ed lec	Oral or written test
12	1		knowledge Management	Electronic using Microsoft Ed lec	Oral or written test

13	1			Electronic lec using Microsoft Edi	Oral or written test
14	1		Project presentation	Electronic lec using Microsoft Edi	Oral or written test
15	1		Project presentation	Electronic lec using Microsoft Edi	Oral or written test

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1-Public Administration (Foundations, Functions and Modern Trends), 2013 2-Introduction to management, written by Agadir Salem Al-Aidarous
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Introduction to Operations Research
2. Course Code:
OR 201
3. Semester / Year:
Fall 2024
4. Description Preparation Date:
May 2, 2024
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)

Name: Iraq Ali Hussein alzuheary
 Email: iraqali@uodiyala.edu.iq

8. Course Objectives

Course Objectives	<p>To introduce the basic concepts and techniques of operations research.</p> <p>To develop skills in formulating, solving, and analyzing optimization models.</p> <p>To apply operations research methods to real-world problems in various industries.</p> <p>To understand and utilize software tools for operations research applications..</p>
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9. Teaching and Learning Strategies

Strategy	<p>Lectures detailing theory and methods of operations research.</p> <p>Hands-on labs using software like LINGO, MATLAB, and Excel Solver.</p> <p>Case studies to illustrate applications in real-world scenarios.</p> <p>Group projects to encourage collaborative problem solving.</p>
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	Introduction to Operations Research	Foundations	Lecture + Software Labs	Quiz
3-4	4	Linear Programming Models	Linear Optimization	Lecture + Case Studies	Project Presentation
5-6	4	Integer and Nonlinear Programming	Advanced Models	Hands-on Labs	Homework
7-8	4	Network Models and Graphs	Network Analysis	Interactive Sessions	Group Work

9-10	4	Simulation and Risk Analysis	Simulation Techniques	Workshops	Midterm Exam
11-12	4	Decision Analysis and Game Theory	Decision Making	Case Studies	Final Project
11.Course Evaluation					
Weekly Assignments: 20%					
Project Work: 25%					
Midterm Exam: 25%					
Final Exam: 30%					
12.Learning and Teaching Resources					
Required textbooks (curricular books, any)			Operations Research: An Introduction by Taha		
Main references (sources)			Operations Research: Applications and Algorithms by Winston		
Recommended books and references (scientific journals, reports...)			The Science of Decision Making		
Electronic References, Websites			INFORMS (www.informs.org)		

Course Description Form

175.	Course Name:
	System Programming
176.	Course Code:
	OPT6
177.	Semester / Year:
	2023-2024
178.	Description Preparation Date:
179.	Available Attendance Forms:
180.	Number of Credit Hours (Total) / Number of Units (Total) 3

181. Course administrator's name (mention all, if more than one name)

Name: **Bashar Talib Alnuaimi**
 Email: alnuaimi_bashar@uodiyala.edu.iq

182. Course Objectives

Course Objectives

- This course is an introductory course on computer systems. It introduces computer systems from a programmer's perspective, rather than a system implementer's perspective, which prepares students for more advanced topics that discuss the internals of a computer system (e.g., operating systems or computer architecture). As a result, the focus of the course is teaching programmable interfaces of a computer system as well as how to use them correctly and effectively when writing a program. The topics mainly include hardware/software interfaces (e.g., data representation and memory) and OS/application interfaces (e.g., syscalls). In discussing these topics, the course gives an overview of a complete computer system, including hardware, operating system, compiler, and network, in order to guide students through various components that modern programs rely on to accomplish their intended purposes.

183. Teaching and Learning Strategies

Strategy

- Overview of systems programming
- Users, files and manuals
- Directories, file properties and file systems
- Terminal control and signals
- Event driven programming
- Processes and programs
- i/o redirection and pipes
- Servers and sockets
- Threads

184. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	System Programming: Introduction, Operating System Examples		Lecture Base	
2	3	Operating Systems Scheduling		Lecture Base	
3	3	Shell, BIOS and Booting Process		Lecture Base	
4	3	Assembler and Compiler		Lecture Base	
5	3	Linker and Loader		Lecture Base	
6	3			Lecture Base	

		System Calls API(Application Program Interface)			
7	3	Mid term exam		Lecture Base	
8	3	Interrupt		Lecture Base	
9	3	Exception handling		Lecture Base	
10	3	Memory Mapped and DLLs (API Programming)		Lecture Base	
11	3	Processes		Lecture Base	
12	3	Device Drivers and Services		Lecture Base	
13	3	Project presentation		Lecture Base	
14	3	Project presentation		Lecture Base	
15	2	Exam		Lecture Base	

185. Course Evaluation

The course is an introduction to modeling and simulation. It includes the following topics: Fundamental concepts of computer simulation; Models for computer simulation; Random numbers: pseudorandom number generation and testing, Monte Carlo methods; Introduction to distribution functions; Simulation modeling; Discrete-event simulation; Continuous simulation; Verification and validation of simulation models; Input analysis; Output analysis; Queuing theory models; Design code; Test and Debug simulation programs; Sample of applications. There will be weekly practice in the lab.

186. Learning and Teaching Resources

Required textbooks (curricular books if any)	Computer Systems: Programmer's Perspective
Main references (sources)	<ul style="list-style-type: none"> Simulation Modeling and Analysis , 5/e, by Averil M Law and W. David Kelton, McGraw Hill, 2015. www.mhhe.com/engcs/industrial/lawkelton -Windows System Programming, 3rd edition
Electronic References, Websites	

Course Description Form

187.	Course Name: Computer Architecture
188.	Course Code: COM4
189.	Semester / Year: Semester
190.	Description Preparation Date: 2023-2024
191.	Available Attendance Forms: presence
192.	Number of Credit Hours (Total) / Number of Units (Total): 30 class hours, 2 hours per week, 15 weeks
193.	Course administrator's name (mention all, if more than one name)
	Name: Asst. Prof. Dr. Khalid Mohammed Saffer Email: dr.khaledmoh@uodiyala.edu.iq
194.	Course Objectives
Course Objectives	Studying the basic concepts of computer architecture and the stages of its development, in addition to the mechanism of operation and interconnection of the various units that make up the computer.

195. Teaching and Learning Strategies

Strategy

- lecture
- Conducting discussion panels within the lecture
- Giving weekly homework
- Asking questions during the lecture

196. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Introduction to computer architecture	lecture	Short exam
2	2		Basic organization of computer	lecture	Short exam
3	2		Basic operational concept	lecture	Short exam
4	2		Bus structures	lecture	Short exam
5	2		Requirements of I/O system	lecture	Short exam
6	2		I/O interfacing techniques	lecture	Short exam
7	2		Memory system organization	lecture	Short exam
8	2		Midterm exam		
9	2		Memory hierarchy	lecture	Short exam
10	2		Memory structure and its requirements	lecture	Short exam
11	2		Associative memory	lecture	Short exam
12	2		Cache memory	lecture	Short exam
13	2		8085 Microprocessor	lecture	Short exam
14	2		Intel core family	lecture	Short exam
15	2		Intel core family	lecture	Short exam

197. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

- Short weekly exams
- Monthly exams
- Degrees of participation in answering the questions asked during the lecture
- Degrees of homework

198. Learning and Teaching Resources

Required textbooks (curricular books, any)	- Mano, M. Morris, Computer System Architecture, 3rd Edition, Prentice-Hall, Inc., 1993.
Main references (sources)	- Mostafa Abd-El-Barr, Hesham El-Rewini, "Fundamentals of Computer Organization and Architecture", A John Wiley & Sons, Inc Publication, 2005. - M. Morris Mano, Computer Engineering Hardware Design, 1st Edition, Prentice-Hall, Inc., 1988.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

199.	Course Name:	Design and Analysis of Algorithms
200.	Course Code:	COM10
201.	Semester / Year:	Second/2023-2024
202.	Description Preparation Date:	1/5/2024
203.	Available Attendance Forms:	Presence
204.	Number of Credit Hours (Total) / Number of Units (Total)	30/3
205.	Course administrator's name (mention all, if more than one name)	
	Name: Muna Rashid Hameed Email: munarashid@uodiyala.edu.iq	
206.	Course Objectives	
	Course Objectives	<ul style="list-style-type: none"> This is an intermediate course on algorithm design. The first part of this course is intended to make students familiar with some basic graph algorithms and their efficiency analysis. The second part of this course will provide a detailed introduction to different algorithm design paradigms with illustrative problems. The third

part of this course is looking at designing algorithms for the classical network flow problem. The last part of this course will deal with computationally hard problems and tackling them using approximation algorithms.

207. Teaching and Learning Strategies

Strategy

- To develop the ability to analyze the running time and prove the correctness of basic algorithms.
- To be able to design efficient algorithms for moderately difficult computational problems, using various algorithm design techniques taught in the course.
- To be able to prove the hardness of NP-Hard problems using simple reductions.
- To be able to do performance analysis of simple approximation algorithms.

208. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			An Introduction to algorithms	Electronic lect using Micros Editor	Oral or written test
2			Asymptotic analysis upper and average complexity bound	Electronic lect using Micros Editor	Oral or written test
3			Identifying difference among best, average and worst case behaviors	Electronic lect using Micros Editor	Oral or written test
4			Big O, little o, and theta notation	Electronic lect using Micros Editor	Oral or written test
5			Standard complexity classes	Electronic lect using Micros Editor	Oral or written test
6			Empirical measurements of performance of algorithms	Electronic lect using Micros Editor	Oral or written test
7			Time and space trade offs in algorithms	Electronic lect using Micros Editor	Oral or written test

8			Divide-and-conquer O(N log N) sorting algorithms (Quicksort, heap sort, merge sort)	Electronic lecture using Microsoft Editor	Oral or written test
9			Binary search tree Sequential and binary search algorithms	Electronic lecture using Microsoft Editor	Oral or written test
10			Quadratic sorting algorithms (selection insertion)	Electronic lecture using Microsoft Editor	Oral or written test
11			Advanced Design and Analysis Techniques	Electronic lecture using Microsoft Editor	Oral or written test
12			Brute-force algorithms Greedy algorithms	Electronic lecture using Microsoft Editor	Oral or written test
13			Graph Algorithms Shortest path algorithms (Dijkstra's and Floyd algorithms)	Electronic lecture using Microsoft Editor	Oral or written test
14			Simple numerical algorithms	Electronic lecture using Microsoft Editor	Oral or written test
15			Hash tables, including collision-avoidance strategies	Electronic lecture using Microsoft Editor	Oral or written test

209. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc

210. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	- Introduction to Algorithms By Thomas Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Third Edition, 2009
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Introduction To Design And Analysis Of Algorithms by Anany Levitin, Pearson Education, 2003 Algorithm Design By Jon Kleinberg, Eva Tardos, 2006

Course Description Form

211.	Course Name: Databases 1
212.	Course Code: COM16
213.	Semester / Year: semester1/ second stage
214.	Description Preparation Date: 14/4/2024
215.	Available Attendance Forms: Attendance inside the university
216.	Number of Credit Hours (Total) / Number of Units (Total) 2 theoretical + 2 practical sessions per week."
217.	Course administrator's name (mention all, if more than one name) Name: Lec. Zainab mohammed Ali Jasim Email:
218.	Course Objectives
<p>Course Objectives</p>	<p>Having a database environment entails achieving several objectives, the most important of which are as follows:</p> <p>A - The ability to represent the natural structure of data in a way that reflects the logical relationships between the data.</p> <p>B - Ensuring that data can be segmented among users to form a variety of products.</p> <p>C - Overall low cost of storage requirements.</p> <p>D - Physical and logical organization of data so that it can meet expected queries with appropriate speed, as well as handle unplanned queries or produce non-routine reports.</p>

	<p>E - Alignment with existing systems and compatibility with them. The database system adopted by the organization must align with the programs, data, and procedures existing within the organization.</p> <p>F - Flexibility to interact with future systems. One of the main objectives of designing a database is to plan it in a way that allows for modifications and improvements without the need to modify application programs or reorganize files.</p> <p>G - Achieving interaction between multiple users and the database.</p> <p>H - Achieving logical correlation between distributed data within the sub-files of the database.</p> <p>I - Allowing users to form their own opinions about the data regardless of the physical storage method of the data.</p> <p>J - Allowing the database to evolve according to user needs.</p>
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219. Teaching and Learning Strategies

Strategy	<p>Lectures are presented in electronic presentation format, and interactive whiteboard used during practical sessions. 2- Discussion/formation of discussion groups during lectures to discuss modern systems that require thinking and analysis. 3- Use educational technologies (tutorial videos). 4- Assigning student's homework that require self-explanatory interpretations. 5- Providing students with various skills and knowledge related to their mental capacity.</p>
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220. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1	2		Introduction to Database & Database Management system.	Electronic lect using Micros Editor	Oral or written test
2	2		Database System Concepts and Architecture	Electronic lect using Micros Editor	Oral or written test
3	2		Data Models, Schemas, and Instances	Electronic lect using Micros Editor	Oral or written test
4	2		The Three-Schen Architecture	Electronic lect using Micros Editor	Oral or written test
5	2		Data Independen	Electronic lect using Micros Editor	Oral or written test
6	2		Centralized and Client/Server Architectures fo DBMSs	Electronic lect using Micros Editor	Oral or written test
7	2		Centralized DBM Architecture	Electronic lect using Micros Editor	Oral or written test
8	2		Basic Client/Serv Architectures	Electronic lect using Micros Editor	Oral or written test
9	2		Two-Tier Client/Server Architectures fo DBMSs	Electronic lect using Micros Editor	Oral or written test
10	2		Three-Tier and n Tier Architecture for Web Applications	Electronic lect using Micros Editor	Oral or written test
11	2		Entity Relationsh Models (ERMs)	Electronic lect using Micros Editor	Oral or written test
12	2		Database Desig Process	Electronic lect using Micros Editor	Oral or written test
13	2		Basic ER Modell	Electronic lect using Micros Editor	Oral or written test
14	2		Basic Relationsh	Electronic lect using Micros Editor	Oral or written test
15	2		Mapping Constraints	Electronic lect using Micros Editor	Oral or written test

221. Course Evaluation

- 1- Academic Achievements
- 2- Personal Achievements
- 3- Reports and Studies
- 4- Daily Assignments with Self-explanatory Solutions
- 5- Multiple Choice Questions with Answers

222. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	FUNDAMENTALS OF Database Systems, SIXTH EDITION, Ramez Elmasri & Shamkant B. Navathe -
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

223.	Course Name: Databases 2
224.	Course Code: COM17
225.	Semester / Year: semester1/ second stage

226. Description Preparation Date: 14/4/2024	
227. Available Attendance Forms: Attendance inside the university	
228. Number of Credit Hours (Total) / Number of Units (Total) 2 theoretical + 2 practical sessions per week."	
229. Course administrator's name (mention all, if more than one name) Name: Lec. Zainab mohammed Ali Jasim Email:	
230. Course Objectives	
Course Objectives	<p>Having a database environment entails achieving several objectives, the most important of which are as follows:</p> <p>A - The ability to represent the natural structure of data in a way that reflects the logical relationships between the data.</p> <p>B - Ensuring that data can be segmented among users to form a variety of products.</p> <p>C - Overall low cost of storage requirements.</p> <p>D - Physical and logical organization of data so that it can meet expected queries with appropriate speed, as well as handle unplanned queries or produce non-routine reports.</p> <p>E - Alignment with existing systems and compatibility with them. The database system adopted by the organization must align with the programs, data, and procedures existing within the organization.</p> <p>F - Flexibility to interact with future systems. One of the main objectives of designing a database is to plan it in a way</p>

that allows for modifications and improvements without the need to modify application programs or reorganize files.

G - Achieving interaction between multiple users and the database.

H - Achieving logical correlation between distributed data within the sub-files of the database.

I - Allowing users to form their own opinions about the data regardless of the physical storage method of the data.

J - Allowing the database to evolve according to user needs.

231. Teaching and Learning Strategies

Strategy

Lectures are presented in electronic presentation format, and interactive whiteboard used during practical sessions. 2- Discussion/formation of discussion groups during lectures to discuss modern systems that require thinking and analysis. 3- Use educational technologies (tutorial videos). 4- Assigning student's homework that requires self-explanatory interpretations. 5- Providing students with various skills and knowledge related to their mental capacity.

232. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Relational Algebra	Electronic lecture using Microsoft Editor	Oral or written test
2	2		Selection in relational algebra	Electronic lecture using Microsoft Editor	Oral or written test
3	2		Projection in relational algebra	Electronic lecture using Microsoft Editor	Oral or written test
4	2		SET Operations semantics	Electronic lecture using Microsoft Editor	Oral or written test
5	2		Set operations - requirements (part)	Electronic lecture using Microsoft Editor	Oral or written test

6	2		Set operations requirements (part 2)	Electronic lecture using Microsoft Editor	Oral or written test
7	2		Database Keys	Electronic lecture using Microsoft Editor	Oral or written test
8	2		Primary Key & Foreign Key	Electronic lecture using Microsoft Editor	Oral or written test
9	2		Secondary Key & Alternative Key	Electronic lecture using Microsoft Editor	Oral or written test
10	2		Examples on databases keys	Electronic lecture using Microsoft Editor	Oral or written test
11	2		Normalization	Electronic lecture using Microsoft Editor	Oral or written test
12	2		Un-Normalized Form (UNF)	Electronic lecture using Microsoft Editor	Oral or written test
13	2		First-Normal Form (1NF)	Electronic lecture using Microsoft Editor	Oral or written test
14	2		Second-Normal Form (2NF)	Electronic lecture using Microsoft Editor	Oral or written test
15	2		Third-Normal Form (3NF)	Electronic lecture using Microsoft Editor	Oral or written test

233. Course Evaluation

- 1-Academic Achievements
- 2- Personal Achievements
- 3- Reports and Studies
- 4- Daily Assignments with Self-explanatory Solutions
- 5- Multiple Choice Questions with Answers

234. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	FUNDAMENTALS OF Database Systems, SIXTH EDITION, Ramez Elmasri & Shamkant B. Navathe -
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Basic Arithmetic Methods
2. Course Code:
MATH 101
3. Semester / Year:
Fall 2024
4. Description Preparation Date:
May 2, 2024
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)

Name: Iraq Ali Hussein alzuheary
 Email: iraqali@uodiyala.edu.iq

8. Course Objectives

Course Objectives	<p>To understand the fundamental concepts of arithmetic including addition, subtraction, multiplication, and division.</p> <p>To apply arithmetic operations to solve real-world problems.</p> <p>To develop proficiency in mental math and estimation techniques.</p> <p>To introduce the basics of fractions, decimals, and percentages.</p>
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9. Teaching and Learning Strategies

Strategy	<p>Lectures to introduce each topic.</p> <p>Interactive sessions to engage students in solving problems.</p> <p>Weekly practice sessions to reinforce learning through exercises.</p> <p>Use of technology and software tools to enhance understanding.</p>
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understand and perform addition and subtraction	Basic Operations	Lecture + Exercises	Weekly Quiz
2	3	Master multiplication tables	Multiplication	Interactive Practice	In-class Activities
3	3	Apply division in various contexts	Division	Lecture + Exercises	Homework Assignments
4	3	Utilize arithmetic	Applied Arithmetic	Case Studies	Group Project

		operations in real-world scenarios			
5	3	Introduction to fractions and decimals	Fractions and Decimals	Lecture + Demonstration	Quiz
6-10	3	Deepen understanding of percentages, ratios, and proportions	Advanced Topics	Mixed Methods	Midterm Examination

11. Course Evaluation

Daily Preparation: 10%
Daily Oral Participation: 10%
Monthly Written Exams: 30%
Reports: 20%
Final Examination: 30%

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	Elementary Arithmetic by John Doe
Main references (sources)	Principles of Mathematics by Jane R
Recommended books and references (scientific journals, reports...)	Mathematical Foundations by A Turing
Electronic References, Websites	Khan Academy (www.khanacademy.org), Coursera (www.coursera.org)

Course Description Form

1. Course Name:
Data structure
2. Course Code:
204CODS
3. Semester / Year:
First semester/second year
4. Description Preparation Date:
4/4/2024
5. Available Attendance Forms:
4/4/2024
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours/3units
7. Course administrator's name (mention all, if more than one name)

Name: layla abd al.haq esmaeel
 Email: laylaaeabdalhaq@uodiyala.edu.iq

8. Course Objectives

Course Objectives	<p>1- The goal required of the student in order to successfully pass the course requirements is to understand how- Through it, data is represented and stored inside the calculator.</p> <p>2- The student's awareness of the types of algorithms used to represent data</p> <p>3- Developing the student's ability to use the software available in this field in addition to the skills he acquires Here it is - in data processing - and how it is represented inside the calculator</p> <p>4- Developing the student's ability to write software that processes data and how Representing it inside the calculator.....</p>
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9. Teaching and Learning Strategies

Strategy	<p>1-Follow up on scientific development by contacting international universities via Internet Nete</p> <p>2- Participation in scientific conferences inside and outside the country</p> <p>3- Participation in scientific workshops and seminars inside and outside Qatar</p> <p>4 - Field visits in industrial projects, state institutions, and private sector companies</p>
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Definitions and a general introduction during which Explanation of the required notes and instructions The students and the professor must adhere to it in order to achieve the best performance in studying the subject.		Electronic Lecture using editor Microsoft	Oral written t
2	3	Data Structure anIntroduction		Electronic Lecture using editor Microsoft	Oral written t
3	3	Pointer and references		Electronic Lecture using editor Microsoft	Oral written t
4	3	Strategies for choosing th right structure		Electronic Lecture using editor Microsoft	Oral written t
5	3	String and stringprocessing		Electronic Lecture using editor Microsoft	Oral written t
6	3	Analysis of Algorithms		Electronic Lecture using editor Microsoft	Oral written t
7	3	Representation of numeridata		Electronic Lecture using editor Microsoft	Oral written t

8	3	Array		Electronic Lecture using editor Microsoft	Oral written t
9	3	Stack		Electronic Lecture using editor Microsoft	Oral written t
10	3	Queues		Electronic Lecture using editor Microsoft	Oral written t
11	3	Linked list (Single and Double)		Electronic Lecture using editor Microsoft	Oral written t
12	3	Recursion		Electronic Lecture using editor Microsoft	Oral or written t
13	3	Sorting and Searching		Electronic Lecture using editor Microsoft	Oral or written t
14	3	Trees		Electronic Lecture using editor Microsoft	Oral or written t
15	3	Graph and Hash Table		Electronic Lecture using editor Microsoft	Oral or written t

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	*An Introduction to Data structures with Applications by Tremblay and Sorenson * Tanenbaum Aaron M, Langsam Yedidiah, Augenstein J Moshe, Data Structures using C. * An introduction to data structures with applications
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Data Structures By Seymour Lipschutz [Schaum's Outline]

Course Description Form

235.	Course Name:	Computer Skills 2
236.	Course Code:	COM2
237.	Semester / Year:	First Semester 2023-2024
238.	Description Preparation Date:	2024
239.	Available Attendance Forms:	Presence
240.	Number of Credit Hours (Total) / Number of Units (Total)	60
241.	Course administrator's name (mention all, if more than one name)	Name: Juliet Kadum Dawood Email: julietkadum@uodiyala.edu.iq
242.	Course Objectives	
	Course Objectives	This academic lesson is the basic foundation for learning software applications, starting from the academic subject to: 1- The student learns how to use computer and programmed devices (Microsoft Office Word, Microsoft Office Excel, Microsoft Office Power Point) and networks, which is an essential part of computer skills.

	<p>2- Developing the student's skills using (MS-Office) in various fields to deal with its tools.</p> <p>3- By trying out students' skills to achieve success and excellence in the current labor market, which requires computer knowledge and skills from them.</p>
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243. Teaching and Learning Strategies

Strategy	<p>1- The lecture is given in the form of (presentations) electronically, and the interactive whiteboard is used during the (practical) attendance.</p> <p>2- Discussion/forming discussion groups during lectures to discuss modern systems that require thinking and analysis</p> <p>3- Using educational technologies (educational video).</p> <p>4- Giving students homework that requires self-explanation</p> <p>5- Providing students with many different skills and knowledge related to their mental level.</p>
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244. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2 theoretical 2 practical		Introduction to MS-office (Basic components and Window)	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
2.	2 theoretical 2 practical		Microsoft Office Word	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
3.	2 theoretical 2 practical		a)Fundamentals and Application b)menus c) General	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
4.	2 theoretical 2 practical		d)Editing e)formatting f)Navigation Pane and layout	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
5.	2 theoretical 2 practical		g) Text selection h) Tables I)Drawing and graphics	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
6.	2 theoretical 2 practical		Microsoft Office PowerPoint	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
7.	2 theoretical 2 practical		a)Fundamentals and Application	In-person lecture using computer, display screen, pen and blackboard	Oral or written test

			b)menus c)General		
8.	2 theoretical 2 practical		d)Editing e)formatting f)Navigation g) Text selection	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
9.	2 theoretical 2 practical		h) slides show delivery I)Drawing and graphics j)View buttons	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
10.	2 theoretical 2 practical		Microsoft Office Excel	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
11.	2 theoretical 2 practical		a)Fundamentals and Application b)menus c)General	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
12.	2 theoretical 2 practical		d)Editing e)formatting f) Navigation g)formulas and functions	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
13.	2 theoretical 2 practical		h)charts i)workbook management	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
14.	2 theoretical 2 practical		Introduction of Network	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
15.	2 theoretical 2 practical		Types of networking	In-person lecture using computer, display screen, pen and blackboard	Oral or written test

16.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

17.Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1- Computer Skill(2) 2- Basic Computer Skills
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

245.	Course Name:	Human Computer Interaction(HCI)		
246.	Course Code:	COM28		
247.	Semester / Year:	Second/2023-2024		
248.	Description Preparation Date:	15/4/2024		
249.	Available Attendance Forms:	Presence		
250.	Number of Credit Hours (Total) / Number of Units (Total)	30		
251.	Course administrator's name (mention all, if more than one name)	Name: Samah Jalil Saba Email: samahjalil@uodiyala.edu.iq		
252.	Course Objectives	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 45%; vertical-align: top;"> Course Objectives </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Cognitive goals <ul style="list-style-type: none"> - Introducing the student to the basics of human-computer interaction Understanding the human element, its interaction and cooperation with the interfaces. -Defining the perception of the human being The effect of interaction with humans Training students on many of th interactive projects • Skills objectives of the course <ul style="list-style-type: none"> -Knowledge skills -remembering </td> </tr> </table>	Course Objectives	<ul style="list-style-type: none"> • Cognitive goals <ul style="list-style-type: none"> - Introducing the student to the basics of human-computer interaction Understanding the human element, its interaction and cooperation with the interfaces. -Defining the perception of the human being The effect of interaction with humans Training students on many of th interactive projects • Skills objectives of the course <ul style="list-style-type: none"> -Knowledge skills -remembering
Course Objectives	<ul style="list-style-type: none"> • Cognitive goals <ul style="list-style-type: none"> - Introducing the student to the basics of human-computer interaction Understanding the human element, its interaction and cooperation with the interfaces. -Defining the perception of the human being The effect of interaction with humans Training students on many of th interactive projects • Skills objectives of the course <ul style="list-style-type: none"> -Knowledge skills -remembering 			

-Reminding and analysis skills
-Usage and development skills

253. Teaching and Learning Strategies

Strategy

Teaching and learning strategies for human-computer interaction can include a variety of methods and techniques that help improve student understanding and acquisition of concepts and skills in this complex field. Here are some suggested strategies:

Interactive learning: This approach encourages students to actively participate in educational processes, whether through group discussions, interactive online activities, or even augmented reality applications that allow students to experience concepts practically.

Problem-based learning: This approach is based on presenting real problems and challenges that students can interact with using the concepts learned. This strategy can enhance students' understanding of how to apply concepts to solving practical problems.

Cooperative Learning: This approach encourages teamwork and knowledge sharing among students. This could include group projects, small discussions, or even learning through collaborative online exercises.

Use of technology: Technology can be used to enhance the learning experience, such as using interactive software, simulations, or multimedia to better illustrate difficult concepts.

254. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Introduction to HCI	Electronic lecture using Microsoft Editor	Oral or written test
2	2		Human perception	Electronic lecture using Microsoft Editor	Oral or written test
3	2		Human perception and information processing	Electronic lecture using Microsoft Editor	Oral or written test
4	2		Models of human computer interaction	Electronic lecture using Microsoft Editor	Oral or written test
5	2		Interaction design basics	Electronic lecture using Microsoft Editor	Oral or written test
6	2		HCI in the software process	Electronic lecture using Microsoft Editor	Oral or written test
7	2		Evaluation techniques	Electronic lecture using Microsoft Editor	Oral or written test

8	2		Midterm exam	Electronic lec using Micro Editor	Oral or written
9	2		Usability	Electronic lec using Micro Editor	Oral or written
10	2		Fundamentals information visualization	Electronic lec using Micro Editor	Oral or written
11	2		Space perception and presenting data space	Electronic lec using Micro Editor	Oral or written
12	2		Understanding Use	Electronic lec using Micro Editor	Oral or written
13	2		User interface design	Electronic lec using Micro Editor	Oral or written
14	2		Project presentation	Electronic lec using Micro Editor	Oral or written
15	2		Project presentation	Electronic lec using Micro Editor	Oral or written

255. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

256. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Ben Shneiderman , Catherine Plaisan
 Designing the User Interface:
 Strategies for Effective Human-
 Computer Interaction," 4th Edition,
 2004, Addison Wesley, IS Alan D, Janet
 E. Gregory D. Russell B., " Human-
 Computer Interaction," 2003, Prentice
 Hall, ISBN 0130461091BN
 0321197860
 - Alan D, Janet E. Gregory D. Russ
 B., " Human-Computer Interactio
 2003, Prentice Hall, ISBN 013046109

Recommended books and references (scientific
journals, reports...)

Electronic References, Websites

Course Description Form

257. Course Name:					
Computer Graphics					
258. Course Code:					
210COCG					
259. Semester / Year:					
Second Semester 2023-2024					
260. Description Preparation Date:					
2024					
261. Available Attendance Forms:					
Presence					
262. Number of Credit Hours (Total) / Number of Units (Total)					
60					
263. Course administrator's name (mention all, if more than one name)					
Name: Juliet Kadum Dawood Email: julietkadum@uodiyala.edu.iq					
264. Course Objectives					
Course Objectives			<p>1- Preparing graduates qualified to work in the field of computer applications by representing data in the form of computer graphics.</p> <p>2-Introducing the student to the field of computer graphics and processing visual and geometric information using computer technologies. It focuses on the mathematical and computational foundations of image generation and processing.</p>		
265. Teaching and Learning Strategies					
Strategy		<p>1- The lecture is given in the form of (presentations) electronically and the interactive whiteboard is used during the (practical) attendance.</p> <p>2- Discussion/forming discussion groups during lectures to discuss modern systems that require thinking and analysis.</p> <p>3- Using educational technologies (educational video).</p> <p>4- Giving students homework that requires self-explanation.</p> <p>5- Providing students with many different skills and knowledge related to their mental level.</p>			
266. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2 theoretical + 2 practical		Introduction Computer graphics	In-person lecture using computer,	Oral or written test

				display screen, pen and blackboard	
2.	2 theoretical + 2 practical		Elementary Figures Plotting Points	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
3.	2 theoretical + 2 practical		Line Drawing Horizontal and Vertical Lines	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
4.	2 theoretical + 2 practical		Arbitrary Lines	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
5.	2 theoretical + 2 practical		Circle Drawing	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
6.	2 theoretical + 2 practical		Different Circle Drawing	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
7.	2 theoretical + 2 practical		Bresenham's Circle Algorithm	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
8.	2 theoretical + 2 practical		Introduction Geometric Transformations	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
9.	2 theoretical + 2 practical		Two-Dimensional Transformations	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
10.	2 theoretical + 2 practical		Some Drawings related to Circle	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
11.	2 theoretical + 2 practical		Some Drawings related to Line	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
12.	2 theoretical + 2 practical		Clipping and Windowing	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
13.	2 theoretical + 2 practical		Introduction Three-Dimensional (3-D)	In-person lecture using computer, display screen, pen and blackboard	Oral or written test

14.2 theoretical + 2 practical		(3-D) Three Dimensional Transformations	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
15.2 theoretical + 2 practical		Scaling+Refelection+Rotate	In-person lecture using computer, display screen, pen and blackboard	Oral or written test

16. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

17. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	<p>1- "Principles of Interactive Computer Graphics", William M. Newman and Robert F. Sprooull, McGraw-Hill International Book Company, 1984.</p> <p>2- "Computer Graphics with Pascal", Marc Berger, the Benjamin / Cummings Publishing Company, 1986.</p> <p>3- "Computer Graphics", Zhigang Xiang and Roy A. Plastock, Schaum's outline Series, McGraw-Hill Company, 1992.</p> <p>4- "Computer Graphics C Version", Donald Hearn and M. Pauline Baker, Prentice-Hall Company, 1997.</p>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

267. Course Name:	Computational mathematics
268. Course Code:	COM-112
269. Semester / Year:	2023-2024
270. Description Preparation Date:	
271. Available Attendance Forms:	

272. Number of Credit Hours (Total) / Number of Units (Total) **5**

273. Course administrator's name (mention all, if more than one name)

Name: *Khalid M.S. Al Zaidi*

Email: dr.khaledmoh@uodiyala.edu.iq

274. Course Objectives

Course Objectives

- The principal objective of this course is to develop the analytic skills need to learn mathematics.
- Studying basic mathematical concepts to solve problems.
- To understand analyze systems in a mathematical manner.
- This course deals with the basic concept of discrete mathematical.
- This is the basic subject for most computer science subjects.

275. Teaching and Learning Strategies

Strategy

Discrete mathematics is foundational material for computer science: Many areas of computer science require the ability to work with concepts from discrete mathematics, specifically material from such areas as set theory, logic, graph theory, combinatorics, and probability theory.

The main strategy that will be adopted in delivering the discrete mathematical structures module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. The module will include a combination of classes, and interactive tutorials.

276. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction - The basic concepts		Lecture Base	
2	3	Sets		Lecture Base	
3	3	Set Operations		Lecture Base	
4	3	Set Operations		Lecture Base	
5	3	Finite sets, counting principle		Lecture Base	
6	3	Cardinality		Lecture Base	
7	3	Mid-term Exam		Lecture Base	
8	3	Inverse relations		Lecture Base	
9	3	Function		Lecture Base	
10	3	Graph of a function		Lecture Base	
11	3	Graphs		Lecture Base	
12	3	Graphs		Lecture Base	
13	3	Connectivity		Lecture Base	
14	3	Special graph		Lecture Base	
15	2	Polish notation		Lecture Base	

277. Course Evaluation

1. Recognize the basic concepts in a discrete mathematical structure.
2. To understand the fundamental properties of sets.
3. Identify the basic sets operations.

4. To study the sets types and counting principle.
5. Recognize the relations and functions to describe the relationship between the elements from two sets.
6. To learn several basic proof techniques.
7. Discuss the proof techniques to prove important results in set theory.

278. Learning and Teaching Resources

Required textbooks (curricular book any)	- Discrete mathematical structures for computer science by Bernard Kolman & Robert C. Busby
Main references (sources)	- Theory and problems of Discrete mathematics, by Seymour Lipschutz & Marc Lars Lipson, Schaum's Outline Series, third edition 2007. - Mathematical foundation of computer science, Y.N. Singh, 2005. • - Discrete Mathematics and Its Applications, Seventh Edition, Kenneth H. Rosen, AT&T Laboratories, 2012.
Electronic References, Websites	- http://www.math.uvic.ca/faculty/gmacgill/guide - http://en.wikibooks.org/wiki/Discrete mathematics/Set theory

Course Description Form

279. Course Name:	Computer Organization
280. Course Code:	COM-123
281. Semester / Year:	2023-2024
282. Description Preparation Date:	
283. Available Attendance Forms:	
284. Number of Credit Hours (Total) / Number of Units (Total)	6
285. Course administrator's name (mention all, if more than one name)	Name: Dr.Bashar Talib AL-Nuaimi Email: alnuaimi_bashar@uodiyala.edu.iq
286. Course Objectives	

Course Objectives	<ul style="list-style-type: none"> • To impart basic concepts of computer architecture and organization, • To explain key skills of constructing cost-effective computer systems. • To familiarize the basic CPU organization. • To help students in understanding various memory devices. • To facilitate students in learning IO communication • Identify various components of computer and their interconnection • Identify basic components and design of the CPU: the ALU and control unit. • Compare and select various Memory devices as per requirement. • Compare various types of IO mapping techniques • Critique the performance issues of cache memory and virtual memory
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287. Teaching and Learning Strategies

Strategy	<p>The module focuses on computer system hardware and how it is used to facilitate the execution of software, including topics such as data representation, digital logic, assembler, memory systems, I/O and microprocessor architecture.</p> <p>The aim of the module is to provide students with an understanding of the functional components of a computer system and how they are organized to facilitate execution. Student will also gain a range of practical skills in the application and construction of computer components that are capable of interfacing with microprocessors.</p> <p>: The main strategy that will be adopted in delivering this module is to encourage student 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 types of simple experiments involving some sampling activities that are interesting to the students.</p>
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288. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction to computer systems Main parts of computer system, organization and architecture	computer system, organization	Lecture Base	
2	3	Von Neumann architecture	Von Neumann architecture	Lecture Base	
3	3	Computer generations		Lecture Base	
4	3	Data presentation Introduction to Computer components	Computer components (motherboard components in details (i.e cpu and memory	Lecture Base	
5	3	(motherboard components in details (i.e cpu and memory details))		Lecture Base	
6	3	INPUT OUTPUT SYSTEM: I/O Devices, Video Color Models	INPUT OUTPUT SYSTEM	Lecture Base	

		CPU, CPU basic organization, Control units			
7	3	MEMORY SYSTEM, Memory hierarchy,	MEMORY SYSTEM	Lecture Base	
8	3	Mid-term Exam		Lecture Base	
9	3	Cache memory, Primary memory, Secondary memory, memory addressing,	Cache memory, Primary memory, Secondary memory,	Lecture Base	
10	3	Semiconductor RAM Memories, Read Only Memories, Speed, Size, and Cost,	Semiconductor RAM Memories, Read	Lecture Base	
11	3	Introduction to Secondary Storage		Lecture Base	
12	3	Hard disk and magnetic drive	Hard disk	Lecture Base	
13	3	Computer s/w	Computer s/w	Lecture Base	
14	3	Machine language, high level language	Machine language, high level language	Lecture Base	
15	2	Preparatory week before the final Exam		Lecture Base	

289. Course Evaluation

The aim of the module is to provide students with an understanding of the functional components of a computer system and how they are organized to facilitate execution. Student will also gain a range of practical skills in the application and construction of computer components that are capable of interfacing with microprocessors.

290. Learning and Teaching Resources

Required textbooks (curricular books any)	
Main references (sources)	<ul style="list-style-type: none"> • Computer Architecture: A Quantitative Approach (5th edition) by J.L. Hennessy and D.A. Patterson (Morgan Kauffmann Publishers) • Computer System Architecture by M. Morris Mano (Pearson Publication)
Electronic References, Websites	https://www.youtube.com/watch?v=O18D69VKX2k&t=147s

Course Description Form

291.	Course Name:	
	Differentiation Methods	
292.	Course Code:	
	COS-101	
293.	Semester / Year:	
	2023-2024	
294.	Description Preparation Date:	
295.	Available Attendance Forms:	
296.	Number of Credit Hours (Total) / Number of Units (Total)	5
297.	Course administrator's name (mention all, if more than one name)	
	Name: <i>Sarab dawood shukur</i>	
	Email: <i>Sarabdawood@uodiyala.edu.iq</i>	
298.	Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • Evaluate limits (as part of Departmental Objectives in Mathematics) • Prove basic theorems using limits of the difference equation • Differentiate algebraic and trigonometric functions using key • Find the tangent line to a given graph at a given point • Solve tangent and area problems using the concepts of limits, derivatives, and integrals. • Draw graphs of algebraic and transcendental functions considering limits, continuity, and differentiability at a point. • Determine whether a function is continuous and/or differentiable at a point using limits. • Use differentiation rules to differentiate algebraic and transcendental 	
299.	Teaching and Learning Strategies	

Strategy	<ul style="list-style-type: none"> Limits and Continuity Limit of a function, evaluation of limits, continuity. Differentiation
	Derivative of a function, rules of differentiation, higher derivatives.

300. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Abbreviations and Notations		Lecture Base	
2	3	Some trigonometric, Slope, Graph and function		Lecture Base	
3	3	Limits: The Idea of Limits. Definitions of Limits. Techniques for Computing Limits.		Lecture Base	
4	3	Limits and Continuity: Infinite Limits. Limits at Infinity. Continuity. Precise Definitions of Limits		Lecture Base	
5	3			Lecture Base	
6	3	Differentiation: Introducing the Derivative. The Derivative as a Function. Rules of Differentiation Differentiation: The Product and Quotient Rules. Derivatives of Trigonometric Functions. Derivatives as Rates of Change.		Lecture Base	
7	3	Differentiation: The Chain Rule,		Lecture Base	
8	3	Differentiation Implicit Differentiation		Lecture Base	
9	3	Differentiation: The Chain Rule, Implicit Differentiation Part1		Lecture Base	
10	3	Differentiation: The Chain Rule, Implicit Differentiation Part2		Lecture Base	
11	3	Differentiation: Derivatives of Inverse Trigonometric Functions. Related Rates. Part1		Lecture Base	
12	3	Differentiation: Derivatives of Inverse Trigonometric Functions. Related Rates. Part2		Lecture Base	
13	3	Applications of Derivatives: Maxima and Minima. Mean Value Theorem. What Derivatives Tell Us part 1		Lecture Base	
14	3	Applications of Derivatives: Maxima and Minima. Mean Value Theorem. What Derivatives Tell Us part 2		Lecture Base	
15	2	Review		Lecture Base	

301. Course Evaluation

The aim of the module is to provide students with an understanding of the functional components of a computer system and how they are organized to facilitate execution. Student will also gain a range of practical skills in the application and construction of computer components that are capable of interfacing with microprocessors.

302. Learning and Teaching Resources

Required textbooks (curricular book any)	Edwards, C.H. and Penney, D.E. Elementary Differential Equations. Prentice-Hall. (latest ed.).
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Main references (sources)	Thomas, G. and Finney, R. Calculus and Analytic Geometry. Addison-Wesley. (latest ed.). Adams, R. Single Variable Calculus. Pearson Education. (latest ed.). •
Electronic References, Websites	

Course Description Form

303. Course Name:	
Discrete Structures	
304. Course Code:	
COM-122	
305. Semester / Year:	
2023-2024	
306. Description Preparation Date:	
307. Available Attendance Forms:	
308. Number of Credit Hours (Total) / Number of Units (Total) 6	
309. Course administrator's name (mention all, if more than one name)	
Name: Dr. Khalid M.S. Al Zaidi Email: dr.khaledmoh@uodiyala.edu.iq	
310. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> The principal objective of this course is to develop the analytic skills need to learn mathematics. Studying basic mathematical concepts to solve problems. To understand analyze systems in a mathematical manner. This course deals with the basic concept of discrete mathematical. This is the basic subject for most computer science subjects To understand the fundamental properties of modeling computation. Identify the finite state machines. To study an optimistic approach principle. Recognize the finite automata. To studies properties deterministic finite state automata. Recognize the propositions and truth values To understand the logical connectives
311. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering the discrete mathematical structures mod is to encourage students' participation in the exercises, while at the same time refining expanding their critical thinking skills. The module will include a combination of classes, interactive tutorial

312. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction - Modeling Computation		Lecture Base	
2	3	Finite state machines		Lecture Base	
3	3	An Optimistic Approach		Lecture Base	
4	3	Finite automata Deterministic Finite State Automata		Lecture Base	
5	3			Lecture Base	
6	3	Logic and Proofs Mid-term Exam		Lecture Base	
7	3	Propositions and Truth Values		Lecture Base	
8	3	Tautologies and Contradictions		Lecture Base	
9	3	Logical Equivalence		Lecture Base	
10	3	The Algebra of propositions		Lecture Base	
11	3	Mathematical Induction		Lecture Base	
12	3	Matrices		Lecture Base	
13	3	Types of Matrices		Lecture Base	
14	3	Operations on Matrices		Lecture Base	
15	2	Preparatory week before the final Exam		Lecture Base	

313. Course Evaluation

Discrete mathematics is foundational material for computer science: Many areas of computer science require the ability to work with concepts from discrete mathematics, specifically material from such areas as set theory, logic, graph theory, combinatorics, and probability theory.

314. Learning and Teaching Resources

Required textbooks (curricular books, any)	
Main references (sources)	<ul style="list-style-type: none"> • Discrete mathematical structures for computer science by Bernard Kolman & Robert C. Busby • Theory and problems of Discrete mathematics, by Seymour Lipschutz & Marc Lars Lipson, Schaum's Outline Series, third edition 2007. • Mathematical foundation of computer science, Y.N. Singh, 2005. • - Discrete Mathematics and Its Applications, Seventh Edition, Kenneth H. Rosen, AT&T Laboratories, 2012

Electronic References, Websites

- <http://www.math.uvic.ca/faculty/gmacgill/guide>

Course Description Form

315.	Course Name:
	English Language
316.	Course Code:
	COS-101
317.	Semester / Year:
	2023-2024
318.	Description Preparation Date:
319.	Available Attendance Forms:

320. Number of Credit Hours (Total) / Number of Units (Total) **2**

321. Course administrator's name (mention all, if more than one name)

Name: *Sarab dawood shukur*

Email: Sarabdawood@uodiyala.edu.iq

322. Course Objectives

Course Objectives

- The module aims to develop the students' English skills in reading, writing, listening and speaking.
- Read and understand simple texts in English.
- Answer simple comprehension questions and match sentences about texts.
- Reconstruct texts by reordering sentences.
- Understand the main idea of a text.
- Identify specific information in a text.
- Writing and paraphrasing paragraphs.

323. Teaching and Learning Strategies

Strategy

Headway's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization. Authentic material from a variety of sources enables students to see new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing section for each unit at the end of the book provides models for students to analyze and imitate.

324. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	am/is/are my/your This is... Introduction dialogues, Everyday English dialogues Introductions, Good morning! Practicing introduction dialogues. People meet each other and introduce someone else. How are you? What's this in English? Numbers 1-10 and plurals.		Lecture Base	
2	3	He/she/they His/her. Questions Where are they from? Two people are on holiday in New York. Students ask and answer questions about where people are from. Countries, Numbers 10-20, 11-30. A set of cities and countries: Brazil, Spain...		Lecture Base	

		Adjectives: awful, really good, fantastic, beautiful Nouns: centre, hospital, building, park			
3	3	Verb to be is recycled and extended to include negative and question forms. We're in Las Vegas! Roleplay: in a band. An interview with the band Metro 5. Jobs: a nurse, a doctor. Personal information: surname, first name, address, married ... Social expressions: I'm sorry, thanks, please...		Lecture Base	
4	3	Possessive adjectives. Possessive 's. Has/ have Adjective + noun Irregular Plurals Paddy McNab and his family, My best friend. The alphabet, On the phone, Saying email addresses. Who are they? Listen and identify the people. The family: mother, son. Describing a friend: very beautiful, really funny...		Lecture Base	
5	3	Present Simple: I/you/we/they a/an Adjective + noun Colin Brodie from Dundee. Role play: At a party. Where is Colin? Who is he with? At a party: Flavia and Terry are at a party in London. The lexical set of sports/food/drinks. Languages and nationalities.		Lecture Base	
6	3	Present Simple: He/she Question and negatives Adverbs of frequency Prepositions of time Lois Maddox Talking about daily routines, Asking and answering questions about daily routines, Lifestyle questionnaire Listening a phone conversation between Lois and Elliot. Days of the week. The time. Words that go together: watch TV, get up early... Question words Subject Pronouns Object Pronouns Possessive Pronouns This and that A postcard from San Francisco, A holiday postcard. Describing lifestyles, preferences and places, Roleplay: conversations in town. Listening the requests with Can I.....? Adjectives: lovely, terrible, comfortable, friendly... Opposite adjectives: new/old, big/small Places: chemist, post office		Lecture Base	
7	3	There is /are Prepositions: in, on, under, next to Vancouver-the best city in the world, What to do and where to go. Talking and asking about rooms and furniture, Giving directions. My home town, Steve talks about living in Vancouver. Rooms and furniture: living room, bedroom ... In and out of town: beach, mountain, sailing,...		Lecture Base	
8	3	Was/were born Past simple: irregular verbs It's a Jackson Pollock. Telling a story from pictures, Saying the dates in English. Magalie Dromand, Magalie dromand talks about her family. Saying years People and jobs Irregular verbs Have, do, go: have lunch, do homework, go shopping		Lecture Base	
9	3	Past simple: regular and irregular Questions Negatives Ago Dialogues with simple past. Did you have a good weekend? Asking about holidays, A questionnaire, My last holiday, Roleplay: asking		Lecture Base	

		and giving directions. Angie and Rick are at work, Jack and Millie's holiday. Weekend activities: go to the cinema, have a meal... Time expressions: on Monday, last night... Sports and leisure: tennis, skiing, windsurfing... Play or go: play tennis, go skiing... Seasons: winter, summer...			
10	3	Can / can't, Adverbs, Adjective + noun Requests and offers The Internet, what can you do on the internet? Talking about what you can do, talking about everyday problems, Five people talk about what they do on the internet. Verbs: draw, run, drive... Verb noun: Listen to the radio, chat to friends Adjective noun: fast car, busy city, dangerous sport Opposite adjectives: dangerous/safe, old/modern, old/young.		Lecture Base	
11	3	I'd like, You are what you eat, Discussion-what is a good diet? Conversation with Adam, Shopping: bread, milk, fruit, Please and thank you Some /any, Like and would like People from different parts of the world describe what they eat. Roleplay: Ordering a meal. Birthday wishes, what people want on their birthday. stamps, cheese, ham... Food: cereal, salad, pasta, fish... In a restaurant: menu, starter, desert, soup, salmon		Lecture Base	
12	3	Present continuous, Present simple and present continuous. This week is different, Colin, a millionaire, gives money to homeless teenagers What's the matter? Why don't you? What is Nigel wearing? Nigel is on holiday, What's the matter. Colors: blue, red, green... Clothes: jacket, trousers, shoes and socks... Opposite verbs: buy/sell, love/hate, open/close...		Lecture Base	
13	3	Future plans, Revision: question words, tenses. Seven countries in seven days, Life's big events: three people talk about their family, education, work and ambitions. A mini autobiography. Eddie is talking to a friend about his holiday plans, social expressions Transport: travel by bus, coach, motorbike, plane... Revision		Lecture Base	
14	3	Irregular verbs, phonetic symbols, consonants and vowels.		Lecture Base	
15	2	Can / can't, Adverbs, Adjective + noun Requests and offers The Internet, what can you do on the internet? Talking about what you can do, talking about everyday problems, Five people talk about what they do on the internet. Verbs: draw, run, drive... Verb noun: Listen to the radio, chat to friends Adjective noun: fast car, busy city, dangerous sport Opposite adjectives: dangerous/safe, old/modern, old/young.		Lecture Base	

325. Course Evaluation

Each unit is organized to enhance students' basic knowledge of vocabulary and grammar through reading texts. The students will learn how to form simple sentences and use them in real life

situations as well as in writing different assignments. By the end of the course, students will be able to produce basic sentences and communicate in simple real-life situations

326. Learning and Teaching Resources

Required textbooks (curricular book any)	New Headway Beginner, by lizand john soars Cotton D., Falvey D., Kent S. Market Leader. Intermediate Business English. Longman, 2001.
Main references (sources)	
Electronic References, Websites	https://www.learnenglish.de/ https://www.englishgrammar.org/ https://www.phrasebank.manchester.ac.uk/

Course Description Form

327. Course Name:	
Human Rights and Democracy	
328. Course Code:	
UD04	
329. Semester / Year:	
2023-2024	
330. Description Preparation Date:	
331. Available Attendance Forms:	
332. Number of Credit Hours (Total) / Number of Units (Total) 2	
333. Course administrator's name (mention all, if more than one name)	
Name:	
Email:	
334. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> 1. During the academic year, the student learns the basics of human rights and democracy, what his rights are, how to defend them through legal means, and what their internal and international guarantees are. 2. Obtaining knowledge in the field of democracy, its types of systems, and their impact on human rights.

	<ul style="list-style-type: none"> 3. Developing the student's personality and enhancing their awareness of democratic political systems, their details, and how to apply them on the ground, and the importance of being effective in society through his respect for the rights of others, knowing that rights and freedoms end where their rights and freedoms begin, and performing his duties instead of just acquiring rights. 4. Promoting a culture of peace based on justice and equality
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335. Teaching and Learning Strategies

Strategy	<p>Part One - Definition of human rights and human rights in ancient civilizations (Defining the right, defining the human being, knowing the importance of human rights for human being and society, and also studying human rights in civilizations such as the Egypt, Iraqi, Greek, and Roman civilizations) (4 hours)</p> <p>The second part: Introduction to human rights in divine religions, the most important of which is Islam (2 hours)</p> <p>Human rights sources include (international sources, such as the Universal Declaration of Human Rights and the two International Covenants, and regional sources, which include regional agreements such as the European and American Conventions and the Constitution) (2 hours)</p> <p>1. Increase the student's awareness of the importance of knowing his rights and duties towards society and the relationship of human rights to the democratic system</p> <p>2. General culture in a group of fields, including the legal, political, and social fields, and raise the student's self-confidence by linking theoretical material to practical reality. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.</p>
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336. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	An introductory lecture on the subject and its importance.		Lecture Base	
2	3	Definition of right, humanity, human rights, the importance of human rights, human rights in the Islamic religion and ancient civilizations.		Lecture Base	
3	3	International, regional and local human rights sources.		Lecture Base	
4	3	Constitutional and legal human rights guarantees and human rights guarantees at the international level. Human rights guarantees in Islam		Lecture Base	
5	3			Lecture Base	
6	3	The role of regional organizations in		Lecture Base	

		protecting human rights. Characteristics of human rights, definition of public freedoms and their types, and comparison between them and rights			
7	3	International human rights law, international humanitarian law, and the Red Cross.		Lecture Base	
8	3	The future of human rights and ways to develop them.		Lecture Base	
9	3	Globalization and human rights.		Lecture Base	
10	3	Definition of democracy, its historical development and principles.		Lecture Base	
11	3	Democracy between universality and privacy.		Lecture Base	
12	3	Forms of democracy/direct democracy.		Lecture Base	
13	3	Semi-direct democracy and representative democracy / pillars of the representative system / forms of the representative system.		Lecture Base	
14	3	Parliament and its types / Election and its conditions / Electoral College.		Lecture Base	
15	2	Organizing the election process / defining electoral districts / electoral lists / candidates / electoral campaign / voting.		Lecture Base	

337. Course Evaluation

The aim of the module is to provide students with an understanding of the functional components of a computer system and how they are organized to facilitate execution. Student will also gain a range of practical skills in the application and construction of computer components that are capable of interfacing with microprocessors.

338. Learning and Teaching Resources

Required textbooks (curricular books if any)

Main references (sources)	<ul style="list-style-type: none"> • تأليف ماهر صالح علاوي ورياض / حقوق الانسان والطفل والديمقراطية عزيز هادي وعلي عبد الرزاق محمد واخرون / العاتك / بيروت / ٢٠٠٩
Electronic References, Websites	<p>عباس الدليمي / حقوق الانسان الفكر والممارسة فخري رشيد، صلاح ياسين / المنظمات الدولية / العاتك لصناعة الكتاب / بغداد عصام العطية / القانون الدولي العام / المكتبة القانونية / بغداد/2012</p>

Course Description Form

1. Course Name: Logic Design					
2. Course Code: COM-114					
3. Semester / Year: First Year Class					
4. Description Preparation Date:01-05-2024					
5. Available Attendance Forms: Weekly , Mandatory attendance					
6. Number of Credit Hours (Total) / Number of Units (Total): 6					
7. Course administrator's name (mention all, if more than one name)					
Name: Yahiea M.H. Al Naiemy Email: yahiea.alnaiemy@uodiyala.edu.iq					
8. Course Objectives					
Course Objectives			<ul style="list-style-type: none"> - Connect the electric circuit - Design Logic Circuit To give a good knowledge about the logic gates and application in digital circuit in computers		
9. Teaching and Learning Strategies					
Strategy		<ul style="list-style-type: none"> -Active lectures - Tutorials - presentation Exercises - Laboratory based session - Team work - Problem solving 			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Hr	A,B,C,D	Demonstrate the difference between systems of number used in digital techniques, Arithmetic operation Binary numbers including 1's & complements	Lecturing , exercises experiments	Exam
2	2Hr	A,B,C,D	BCD & Digital codes, Logic gates	Lecturing , exercises experiments	Exam
3	2Hr	A,B,C,D	Implementation of any Boolean algorithm using logic gates & universal gates,	Lecturing , exercises experiments	Exam

4	2Hr	A,B,C,D	Design, different combinational circuits.	Lecturing , exerc experiments	Exam
5	2Hr	A,B,C,D	Design, different combinational circuits.	Lecturing , exerc experiments	Exam
6	2Hr	A,B,C,D	SOP and POS methods	Lecturing , exerc experiments	Exam
7	2Hr	A,B,C,D	Boolean Algebra (theory) Simplification using basic laws Boolean algebra	Lecturing , exerc experiments	Exam
8	2Hr	A,B,C,D	Simplify any Boolean algebra from variables using Quine McClus method and K-map method.	Lecturing , exerc experiments	Exam
9	2Hr	A,B,C,D	Design of arithmetic circuits.	Lecturing , exerc experiments	Exam
10	2Hr	A,B,C,D	Comparator & code conversion circuits. Multiplexer & Demultiplex circuits	Lecturing , exerc experiments	Exam
11	2Hr	A,B,C,D	Encoder, decoder, decoder with en & priority encoder	Lecturing , exerc experiments	Exam
12	2Hr	A,B,C,D	Sequential logic circuits	Lecturing , exerc experiments	Exam
13	2Hr	A,B,C,D	Illustrate all types of flip-flops and truth tables.	Lecturing , exerc experiments	Exam
14	2Hr	A,B,C,D	Design of synchronous asynchronous counters (up, down up/down)	Lecturing , exerc experiments	Exam
15	2Hr	A,B,C,D	Introduction to shift register	Lecturing , exerc experiments	Exam

11.Course Evaluation

- Exams
- Quizzes
- Homework
- Laboratory reports

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Digital Design. By M. Mano -Laboratory Booklet
Main references (sources)	Digital Design. By M. Mano
Recommended books and references (scientific journals, reports...)	Donald D. Givone (2002), Digital Principles & Design, Tata McGraw Hill.
Electronic References, Websites	

Course Description Form

339. Course Name:

Programming Fundamentals

340. Course Code:

COM-121

341. Semester / Year:

2023-2024

342. Description Preparation Date:

343. Available Attendance Forms:

344. Number of Credit Hours (Total) / Number of Units (Total) **6**

345. Course administrator's name (mention all, if more than one name)

Name: Taha Mohammed Hasan

Email: dr.tahamh@uodiyala.edu.iq

346. Course Objectives

Course Objectives

The educational objectives of this course are

- Demonstrate a thorough understanding of modular programming by designing programs that require the use of programmer-defined functions.
- Demonstrate a thorough understanding of arrays by designing and implementing programs that search and sort arrays.
- Demonstrate a thorough understanding of the object-oriented programming concepts of encapsulation, data abstraction and composition by designing and implementing classes including the use of overloaded functions and constructors.
- Demonstrate a thorough understanding of the concept of pointers and dynamic memory allocation by designing and implementing programs using pointers and dynamic memory allocation.
- Demonstrate a thorough understanding of the implementation of programmer-defined functions and classes by writing code, performing unit testing and debugging of multiple complex programs.
- Demonstrate good documentation style in all of the programs written in this course.
- Demonstrate proficiency in implementing data validation code, performing unit testing, and developing test plans while implementing robust solutions to the assignments in this course.
- Demonstrate a thorough understanding of stream input/output for both console and files.
- Demonstrate an understanding of the differences between C and C++ in the areas of strings, pass by reference/passing pointers, and structs by designing and implementing programs that use C strings, C++ strings, C

language structs and classes.using the Fundamental Theorem of Calculus

347. Teaching and Learning Strategies

Strategy	<ul style="list-style-type: none"> • Lectures • Tutorials • Problem solving • Lab • Case study • Small project
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348. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Array:	Array definition (Two-dimensional array).	Lecture Base	
2	3	Array	operations on Two-dimensional array (add, subtraction, multiplication and invers of array).	Lecture Base	
3	3	Functions		Lecture Base	
4	3	Functions		Lecture Base	
5	3		Lecture Base		
6	3	Functions		Lecture Base	
7	3	Mid-term Exam		Lecture Base	
8	3	Introduction to Classes & Objects		Lecture Base	
9	3	Searching, Sorting, Algorithm Performance Analysis		Lecture Base	
10	3	Searching, Sorting, Algorithm Performance Analysis		Lecture Base	
11	3	Pointers, dynamic memory allocation		Lecture Base	
12	3	More about Classes and OOP		Lecture Base	
13	3	Searching, Sorting, Algorithm Performance Analysis		Lecture Base	
14	3	Recursion		Lecture Base	
15	2	Exam		Lecture Base	

349. Course Evaluation

Introduction to the C++ programming language and its subset, Program structure, blocks, storage types, console and file I/O, functions, arrays, strings, pointers, call-by-reference, call-by-value, and dynamic memory

350. Learning and Teaching Resources

Required textbooks (curricular books, any)	
Main references (sources)	<ul style="list-style-type: none"> • Programming in C++ <ul style="list-style-type: none"> Frank Vahid and Roman Lysecky Available through the zyBooks website directly • A C++ compiler and/or IDE. There are many out there, but the only two that are officially supported: <ul style="list-style-type: none"> - CLion (on Windows and macOS) Visual Studio (Windows only) ▪ Think Like a Programmer, An Introduction to Creative Problem Solving <ul style="list-style-type: none"> V. Anton Spraul ISBN: 978-1593274245 ▪ A good text editor, such as: <ul style="list-style-type: none"> Notepad++ (This is my personal favorite) Sublime Text Atom, or Vim, or anything else you might prefer
Electronic References, Websites	1- http://www.cplusplus.com/ 2- https://www.w3schools.com/cpp/

Course Description Form

351.	Course Name: Computer Networks
352.	Course Code:
353.	Semester / Year: Third Year Class
354.	Description Preparation Date:01-05-2024
355.	Available Attendance Forms: Weekly , Mandatory attendance
356.	Number of Credit Hours (Total) / Number of Units (Total): 2 Hours theoretical +2 Hours practical

357. Course administrator's name (mention all, if more than one name)

Name: Yahiea M.H. Al Naiemy
 Email: yahiea.alnaiemy@uodiyala.edu.iq

358. Course Objectives

Course Objectives

This module introduces the students to Computer Networks through an analysis of basic networking fundamentals. The aim of this module is to provide you with a basic understanding of computer networking. By the end of this module the student should be able to:

1. Demonstrate knowledge of the principles of operation of networking models.
2. Demonstrate knowledge of the principles of operation of networking components and protocols.
3. Demonstrate knowledge of the principles of operation of networking applications.

359. Teaching and Learning Strategies

Strategy

- Active lectures
- Tutorials
- presentation Exercises
- Laboratory based session
- Team work
- Problem solving

360. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Hr	A,B,C,D	Distributed System Architectures complements, Networks Classification	Lecturing , exerci experiments	Exam
2	2Hr	A,B,C,D	Network Topology, Network Componen	Lecturing , exerci experiments	Exam
3	2Hr	A,B,C,D	Private Computer Networks, Public switched data network	Lecturing , exerci experiments	Exam
4	2Hr	A,B,C,D	Local Area Networks (LAN), Wide Area Network (WAN)	Lecturing , exerci experiments	Exam
5	2Hr	A,B,C,D	Transmission Media, Signals type, Data transmission	Lecturing , exerci experiments	Exam
6	2Hr	A,B,C,D	Error detection and correction	Lecturing , exerci experiments	Exam
7	2Hr	A,B,C,D	Computer Network Layers	Lecturing , exerci experiments	Exam
8	2Hr	A,B,C,D	TCP-IP layers	Lecturing , exerci experiments	Exam
9	2Hr	A,B,C,D	Internet Networks	Lecturing , exerci experiments	Exam
10	2Hr	A,B,C,D	Layers of interface	Lecturing , exerci experiments	Exam
11	2Hr	A,B,C,D	Addressing, Netting and sub netting	Lecturing , exerci experiments	Exam
12	2Hr	A,B,C,D	IP Protocol,	Lecturing , exerci experiments	Exam

13	2Hr	A,B,C,D	Switches, Hubs and Routers	Lecturing , exerc experiments	Exam
14	2Hr	A,B,C,D	IOS reference model	Lecturing , exerc experiments	Exam
15	2Hr	A,B,C,D	Designing a small network, Applying addresses to the network	Lecturing , exerc experiments	Exam
361. Course Evaluation					
<input type="checkbox"/> Exams <input type="checkbox"/> Quizzes <input type="checkbox"/> Homework <input type="checkbox"/> Laboratory reports					
362. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			<ul style="list-style-type: none"> - Data Networking, by Behrouz A. Forouzan , 5th Edition 2013. - Computer Network by Andrew Tanenbaum, 5th Edition 2011. TCP/IP Protocol Suite, by • Behrouz Forouzan , 4th Edition 2010. - Data and Computer Communications, William Stallings, 10th Edition 2014. 		
Main references (sources)			Digital Design. By M. Mano		
Recommended books and references (scientific journals, reports...)			-Paper1: Wu, C., et al.: WILL: Wireless indoor Localization without site survey. IEEE Trans. Parallel Distrib. Syst. 24(4), 839-848(2013). - Paper2: Vucic, J. and Langer, K.D., “High-speed visible light communications: State-of-the-art,” in [Optical Fiber Communication Conference and Exposition (OFC/NFOEC), 2012 and the National Fiber Optic Engineers Conference], 1–3 (2012).		
Electronic References, Websites			https://gaia.cs.umass.edu/kurose		

Course Description Form

363.	Course Name: Software Engineering
364.	Course Code: COM15
365.	Semester / Year: First Semester / 2023-2024
366.	Description Preparation Date: 2024
367.	Available Attendance Forms: Mandatory attendance
368.	Number of Credit Hours (Total) / 2 hours theoretical per week / 3 Units
369.	Course administrator's name (mention all, if more than one name) Name: Assist. Prof. Dr. Dheyab Salman Ibrahim Al-nedawy Email: dr.dheyab@uodiyala.edu.iq
370.	Course Objectives
	<p>Teaching the student software engineering principles, fundamental models, important tools and current systems.</p> <p>Teaching and educating students on all the necessary process models such as Waterfall, spiral, prototyping and component-based models in order to build new software.</p> <p>Teaching and educating students on all the necessary requirements related to build new software.</p> <p>Teaching and educating students on all the necessary software implementation methods for a new software.</p> <p>Teaching and educating students on all the necessary software test approaches for a new software.</p> <p>Teaching and educating students on all the necessary evolution ways for new software.</p> <p>Teaching and educating students on all the necessary maintenance methods for new software.</p>

371. Teaching and Learning Strategies

Strategy	<ol style="list-style-type: none">1- To introduce software engineering and to explain its importance.2- To set out the answers to key questions about software engineering.3- Study the life cycle of software products.4- Study the range of models practiced by software developers.5- Create professional-quality software systems with professional techniques and tools.6- Learn to balance large-scale product development, with safety, reliability, cost and scheduling.
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10. Course Structure

Evaluation method	Education method	Unit name and/or topic	Required learning outcomes	hours	Week
Oral or written test	Electronic lecture using Microsoft Editor	Introduction to Software Engineering		2	1
Oral or written test	Electronic lecture using Microsoft Editor	Software Development Life Cycle, SDLC		2	2
Oral or written test	Electronic lecture using Microsoft Editor	Critical Systems		2	3
Oral or written test	Electronic lecture using Microsoft Editor	Software Process Models Waterfall Model		2	4
Oral or written test	Electronic lecture using Microsoft Editor	Prototype Model		2	5
Oral or written test	Electronic lecture using Microsoft Editor	Spiral Model		2	6
Oral or written test	Electronic lecture using Microsoft Editor	Component-Based Model		2	7
Oral or written test	Electronic lecture using Microsoft Editor	<i>Software Requirements</i>		2	9
Oral or written test	Electronic lecture using Microsoft Editor	Software Design		2	10
Oral or written test	Electronic lecture using Microsoft Editor	Software Implementation		2	11
Oral or written test	Electronic lecture using Microsoft Editor	Software Testing		2	12
Oral or written test	Electronic lecture using Microsoft Editor	Software Evolution & Maintenance		2	13

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc.

12. Learning and Teaching Resources

Required textbooks (curricular books any)	Roger S. Pressman, "Software Engineering - A Practitioner's Approach" Seventh Edition, Mc Graw-Hill International Edition, 2010.
Main references (sources)	Sommerville, "Software Engineering", 9th Edition, Pearson Education Asia, 2011
Recommended books and references (scientific journals, reports...)	Rajib Mall, "Fundamentals of Software Engineering", Third Edition, Learning Private Limited, 2009.
Recommended books and references (scientific journals, reports...)	System Design Interview – An Insider's Guide: Volume 2 by Alex Xu and Sahn Lam https://www.amazon.com/Software-Design-Engineering-Books/b?ie=UTF8&node=491316
Recommended books and references (scientific journals, reports...)	Clean Architecture: A Craftsman's Guide to Software Structure and Design (Robert C. Martin Series) https://www.amazon.com/Software-Design-Engineering-Books/b?ie=UTF8&node=491316
Recommended books and references (scientific journals, reports...)	SOFTWARE ENGINEERING Ninth Edition, by Ian Sommerville https://engineering.futureuniversity.com/BOOKS%20FOR%20IT/Software-Engineering-9th-Edition-by-Ian-Sommerville.pdf
Recommended books and references (scientific journals, reports...)	Fundamentals of Software Engineering by Nathaniel Schutta , Jakub Pilimon https://www.oreilly.com/library/view/fundamentals-of-software/9781098143220/

Course Description Form

372.	Course Name: Computer Architecture
373.	Course Code: COM4
374.	Semester / Year: Semester
375.	Description Preparation Date:2023-2024

376. Available Attendance Forms: presence

377. Number of Credit Hours (Total) / Number of Units (Total): 30 class hours, 2 hours per week, 15 weeks

378. Course administrator's name (mention all, if more than one name)

Name: Asst. Prof. Dr. Khalid Mohammed Saffer
Email: dr.khaledmoh@uodiyala.edu.iq

379. Course Objectives

Course Objectives	Studying the basic concepts of computer architecture and the stages of its development, in addition to the mechanism of operation and interconnection of the various units that make up the computer.
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380. Teaching and Learning Strategies

Strategy	<ul style="list-style-type: none"> - lecture - Conducting discussion panels within the lecture - Giving weekly homework - Asking questions during the lecture
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381. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Introduction to computer architecture	lecture	Short exam
2	2		Basic organization of computer	lecture	Short exam
3	2		Basic operational concept	lecture	Short exam
4	2		Bus structures	lecture	Short exam
5	2		Requirements of I/O system	lecture	Short exam
6	2		I/O interfacing techniques	lecture	Short exam
7	2		Memory system organization	lecture	Short exam
8	2		Midterm exam		
9	2		Memory hierarchy	lecture	Short exam
10	2		Memory structure and its requirements	lecture	Short exam

11	2		Associative memory	lecture	Short exam
12	2		Cache memory	lecture	Short exam
13	2		8085 Microprocessor	lecture	Short exam
14	2		Intel core family	lecture	Short exam
15	2		Intel core family	lecture	Short exam
382. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc					
<ul style="list-style-type: none"> - Short weekly exams - Monthly exams - Degrees of participation in answering the questions asked during the lecture - Degrees of homework 					
383. Learning and Teaching Resources					
Required textbooks (curricular books, any)			- Mano, M. Morris, Computer System Architecture, 3rd Edition, Prentice-Hall, Inc., 1993.		
Main references (sources)			<ul style="list-style-type: none"> - Mostafa Abd-El-Barr, Hesham El-Rewini, "Fundamentals of Computer Organization and Architecture", A John Wiley & Sons, Inc Publication, 2005. - M. Morris Mano, Computer Engineering Hardware Design, 1st Edition, Prentice-Hall, Inc., 1988. 		
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

Course Description Form

384. Course Name:
Computer Skills 2
385. Course Code:
COM2
386. Semester / Year:
First Semester 2023-2024
387. Description Preparation Date:
2024
388. Available Attendance Forms:
Presence
389. Number of Credit Hours (Total) / Number of Units (Total)
60

390. Course administrator's name (mention all, if more than one name)

Name: Juliet Kadum Dawood
Email: julietkadum@uodiyala.edu.iq

391. Course Objectives

Course Objectives	<p>This academic lesson is the basic foundation for learning software applications, starting from the academic subject to:</p> <p>1- The student learns how to use computer and programmed devices (Microsoft Office Word, Microsoft Office Excel, Microsoft Office Power Point) and networks, which is an essential part of computer skills.</p> <p>2- Developing the student's skills using (MS-Office) in various fields to deal with its tools.</p> <p>3- By trying out students' skills to achieve success and excellence in the current labor market, which requires computer knowledge and skills from them.</p>
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392. Teaching and Learning Strategies

Strategy	<p>1- The lecture is given in the form of (presentations) electronically, and the interactive whiteboard is used during the (practical) attendance.</p> <p>2- Discussion/forming discussion groups during lectures to discuss modern systems that require thinking and analysis.</p> <p>3- Using educational technologies (educational video).</p> <p>4- Giving students homework that requires self-explanation.</p> <p>5- Providing students with many different skills and knowledge related to their mental level.</p>
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393. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
18.	2 theoretical 2 practical		Introduction to MS-office (Basic components and Window)	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
19.	2 theoretical 2 practical		Microsoft Office Word	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
20.	2 theoretical 2 practical		a) Fundamentals and Application	In-person lecture using computer, display screen, pen and blackboard	Oral or written test

			b)menus		
			c) General		
21.	2 theoretical 2 practical		d)Editing e)formatting f)Navigation Pane and layout	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
22.	2 theoretical 2 practical		g) Text selection h) Tables I)Drawing and graphics	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
23.	2 theoretical 2 practical		Microsoft Office PowerPoint	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
24.	2 theoretical 2 practical		a)Fundamentals and Application b)menus c)General	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
25.	2 theoretical 2 practical		d)Editing e)formatting f)Navigation g) Text selection	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
26.	2 theoretical 2 practical		h) slides show delivery I)Drawing and graphics j)View buttons	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
27.	2 theoretical 2 practical		Microsoft Office Excel	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
28.	2 theoretical 2 practical		a)Fundamentals and Application b)menus c)General	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
29.	2 theoretical 2 practical		d)Editing e)formatting f) Navigation g)formulas and functions	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
30.	2 theoretical 2 practical		h)charts i)workbook management	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
31.	2 theoretical 2 practical		Introduction of Network	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
32.	2 theoretical 2 practical		Types of networking	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
33.Course Evaluation					

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc	
34. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1- Computer Skill(2) 2- Basic Computer Skills
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

394. Course Name:	
Computer Graphics	
395. Course Code:	
210COCG	
396. Semester / Year:	
Second Semester 2023-2024	
397. Description Preparation Date:	
2024	
398. Available Attendance Forms:	
Presence	
399. Number of Credit Hours (Total) / Number of Units (Total)	
60	
400. Course administrator's name (mention all, if more than one name)	
Name: Juliet Kadum Dawood Email: julietkadum@uodiyala.edu.iq	
401. Course Objectives	
Course Objectives	1- Preparing graduates qualified to work in the field of computer applications by representing data in the form of computer graphics.

2-Introducing the student to the field of computer graphics and processing visual and geometric information using computer technologies. It focuses on the mathematical and computational foundations of image generation and processing.

402. Teaching and Learning Strategies

Strategy

- 1- The lecture is given in the form of (presentations) electronically and the interactive whiteboard is used during the (practical) attendance.
- 2- Discussion/forming discussion groups during lectures to discuss modern systems that require thinking and analysis.
- 3- Using educational technologies (educational video).
- 4- Giving students homework that requires self-explanation.
- 5- Providing students with many different skills and knowledge related to their mental level.

403. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
18	2 theoretical + 2 practical		Introduction Computer graphics	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
19	2 theoretical + 2 practical		Elementary Figures Plotting Points	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
20	2 theoretical + 2 practical		Line Drawing Horizontal and Vertical Lines	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
21	2 theoretical + 2 practical		Arbitrary Lines	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
22	2 theoretical + 2 practical		Circle Drawing	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
23	2 theoretical + 2 practical		Different Circle Drawing	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
24	2 theoretical + 2 practical		Bresenham's Circle Algorithm	In-person lecture using computer, display screen,	Oral or written test

				pen and blackboard	
25	2 theoretical + 2 practical		Introduction Geometric Transformations	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
26	2 theoretical + 2 practical		Two-Dimensional Transformations	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
27	2 theoretical + 2 practical		Some Drawings related to Circle	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
28	2 theoretical + 2 practical		Some Drawings related to Line	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
29	2 theoretical + 2 practical		Clipping and Windowing	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
30	2 theoretical + 2 practical		Introduction Three-Dimensional (3-D)	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
31	2 theoretical + 2 practical		(3-D) Three Dimensional Transformations	In-person lecture using computer, display screen, pen and blackboard	Oral or written test
32	2 theoretical + 2 practical		Scaling+Refelection+Rotate	In-person lecture using computer, display screen, pen and blackboard	Oral or written test

33. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

34. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

- 1- "Principles of Interactive Computer Graphics", William M. Newman and Robert F. Sprooull, McGraw-Hill International Book Company, 1984.
- 2- "Computer Graphics with Pascal", Marc Berger, the Benjamin / Cummings Publishing Company, 1986.

	<p>3- "Computer Graphics", Zhigang Xiang and Roy A. Plastock, Schaum's outline Series, McGraw-Hill Company, 1992.</p> <p>4- "Computer Graphics C Version", Donald Hearn and M. Pauline Baker, Prentice-Hall Company, 1997.</p>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

