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 2025 - 2024

University Of Baghdad

College of Science

Computer Science Department

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 academic programs and course descriptions to ensure the proper functioning of the educational process.

Concepts and terminology:
Academic Program Description: The academic program provides a 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 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 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: .....University of Baghdad.....

Faculty/Institute: .....College of Science.....

Scientific Department: .....Computer Science .....

Academic or Professional Program Name: .... Computer Science.....

Final Certificate Name: .....Computer Science.....

Academic System: .....Semesters.....

Description Preparation Date: 1/Oct/2024

File Completion Date: 13/Oct/2024

Signature:

Head of Department Name:

Prof. Dr. Ghadah K. Al-Khafaji

Date: 13/10/2024

Signature:

Scientific Associate Name:

Prof. Dr. Nawar I. Abbas

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Israa

Date:

Signature:

Dr. Israa Ali Zaidan

Raed

Approval of the Dean

Dr. Raed Falih Hassan

4

1. Program Vision

Leadership in education, scientific research, and technological innovation, and in preparing distinguished professionals to build a knowledge-based society and achieve digital transformation.

2. Program Mission

To provide high-quality education and graduate qualified students equipped with the knowledge and skills needed to advance scientific research and meet the demands of the labor market.

3. Program Objectives

1. Provide high-quality education that keeps pace with scientific and technological advancements in computer science.
2. Prepare graduates with strong theoretical knowledge and practical skills aligned with labor market needs.
3. Promote scientific research and innovation in fields such as artificial intelligence, cybersecurity, programming, and software engineering.
4. Encourage academic and research collaboration with local and international institutions.
5. Support tech entrepreneurship and inspire students to develop technological projects that serve society.
6. Instill ethical and professional values in the practice and application of computer science.
7. Contribute to community service through technical consultations, training courses, and digital initiatives.
8. Enhance continuous improvement in the quality of computer science education through program accreditation standards, regular self-assessment, and faculty development.

4. Program Accreditation

Does the program have program accreditation? And from which agency? Yes, according to the requirements of the Ministry of Higher Education and Scientific Research, it aligns with the latest admission requirements for Iraqi universities.

5. Other external influences

Is there a sponsor for the program? Yes, Many Iraqi universities offer programs that are almost supported by Ministry of Higher Education and Scientific Research (MOHESR).

6. Program Structure- shown in the next item according to course code

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	**8**	**16**	**14.82**	**-**
College Requirements	**-**	**-**	**-**	**-**
Department Requirements	**46**	**139**	**85.18**	**-**
Summer Training	**One time either 3rd or 4th year**	**-**	**-**	**-**
Other	**-**	**-**	**-**	**-**

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
Third Year				
1st Semester 2024-2023	CSC3532	Advanced Computer Architecture	2	-
	CSC3533	Computer Graphics	2	2
	CSC3534	Fundamentals of Database	2	2
	CSC3535	WEB Organization	2	1
	CSC3536	Software Engineering	2	-
	CSC3537	Introduction to AI	2	2
	CSC3538	Programming in JAVA	1	2
	CSC3539	English Language	2	-
2nd Semester 2024-2023	CSC3640	Mobile Computing	1	2
	CSC3641	Cryptography	2	2
	CSC3642	Operating Systems I	2	-
	CSC3643	Communications and Networking	1	2
	CSC3644	Relational Database	1	2
	CSC3645	Digital Image Processing (Elective)	2	2
	CSC3646	Neural Networks (Elective)	2	-
	CSC3647	Research Methodology	1	-
Four Year				
1st Semester 2024-2023	CSC4748	Parallel Programming	2	2
	CSC4749	Operating Systems II	2	2
	CSC4750	Advanced Computer Networking	2	2
	CSC4751	Fundamentals of Multimedia (Elective)	2	2
	CSC4752	E-Commerce (Elective)	2	-
	CSC4753	Advanced Mobil Computing (Elective)	2	2
2nd Semester 2024-2023	CSC4854	Data mining	1	2
	CSC4855	Computer Security	2	-
	CSC4856	Robotics Control	2	-
	CSC4857	Data Compression (Elective)	2	2

	CSC4858	Software Development Tools (Elective)	1	2
	CSC4859	Advance Computer Graphics (Elective)	2	2
	CSC4860	English language	2	-
	CSC4861	Project	2	4

8. Expected learning outcomes of the program
A. Knowledge
1. Enabling the student to gain understanding and knowledge of the components of the operating system. 2. Enabling the student to run and execute programs within the computer. 3. Equipping students with the knowledge and understanding of the conceptual framework, foundations, and applications of computer technologies. 4. Teaching the student to use statistical methods for data processing and solving mathematical problems.
B. Skills
1. Scientific and practical skills 2. Reminder and analytical skills 3. Skills in use, application, and development 4. General and transferable skills (other skills related to employability and personal development)
C. Ethics
1. Following scientific advancements through communication with global universities via the internet 2. Participating in scientific conferences inside and outside Iraq 3. Engaging in workshops and scientific seminars inside and outside Iraq 4. Field visits to industrial projects

9. 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**
Third Year/ First Semester	CSC3532	Advanced Computer Architecture	Basic	X	X	X		X	X	X	X	X	X	X	X
	CSC3533	Computer Graphics	Basic	X	X	X		X	X	X	X	X	X	X	X
	CSC3534	Fundamentals of Database	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC3535	WEB Organization	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC3536	Software Engineering	Basic	X	X	X		X	X	X	X	X	X	X	X
	CSC3537	Introduction to AI	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC3538	Programming in JAVA	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC3539	English Language	Basic										X	X	

Third Year/ Second Semester	CSC3640	Mobile Computing	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC3641	Cryptography	Basic	X	X	X		X	X	X	X	X	X	X	X
	CSC3642	Operating Systems I	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC3643	Communications and Networking	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC3644	Relational Database	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC3645	Digital Image Processing (Elective)	Optional	X	X	X	X	X	X	X	X	X	X	X	X
	CSC3646	Neural Networks (Elective)	Optional	X	X	X		X	X	X	X	X	X	X	X
	CSC3647	Research Methodology	Basic										X	X	
Fourth Year/	CSC4748	Parallel Programming	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC4749	Operating Systems II	Basic	X	X	X	X	X	X	X	X	X	X	X	X

First Semester	CSC4750	Advanced Computer Networking	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC4751	Fundamentals of Multimedia (Elective)	Optional	X	X	X	X	X	X	X	X	X	X	X	X
	CSC4752	E-Commerce (Elective)	Optional	X	X	X		X	X	X	X	X	X	X	X
	CSC4753	Advanced Mobil Computing (Elective)	Optional	X	X	X	X	X	X	X	X	X	X	X	X
Fourth Year/ Second Semester	CSC4854	Data mining	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC4855	Computer Security	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC4856	Robotics Control	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	CSC4857	Data Compression (Elective)	Optional	X	X	X	X	X	X	X	X	X	X	X	X
	CSC4858	Software Development	Optional	X	X	X		X	X	X	X	X	X	X	X

		Tools (Elective)													
	CSC4859	Advance Computer Graphics (Elective)	Optional	X	X	X	X	X	X	X	X	X	X	X	X
	CSC4860	English language	Basic										X	X	
	CSC4861	Project	Basic	X	X	X	X	X	X	X	X	X	X	X	X

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

Third Grade – First Semester

ADVANCED COMPUTER ARCHITECTURE COURSE DESCRIPTION

1. Course Name:	
Advanced Computer Architecture	
2. Course Code:	
CSC3532	
3. Semester / Year:	
Third Grade/ 1st semester / 2024-2025	
4. Description Preparation Date:	
1/Oct/2024	
5. Available Attendance Forms:	
In person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
100 hr/ 2 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Nahlah Abdulrahman Alkhalidi Email: nahlah.a@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	• Understand the computer system and basic computer components. • To understand all physical aspects of computer systems e.g., circuit design, control signals, and memory types. • To understand the input/output organization and peripheral devices. • Understand interface as a shared boundary between two separate components of the computer system for communication purposes. • To understand computer memory as the storage space in the computer and learn its types. • To learn the concept of multicore, multiprocessor, and multiprogramming Systems.
9. Teaching and Learning Strategies	
Strategy	The strategy that will be adopted in introducing this unit is to introduce operational units and their interrelationships that fulfill the architectural specifications of a digital computer system and make students aware of how data is processed, stored, and transmitted within a computer system. This is done by encouraging students to take advantage of the study materials provided by selecting and specifying the specifications of the devices they choose to build a computer system with good specifications and a reasonable cost.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Identify the computer organization and its basic components	Introduction to the computer architecture	– Direct Instructions – lecture – Discussion	– Quizzes – Assignments – Seminars – Midterms

2	2	Learn how the various computer components communicate with each other.	Programming I/O Devices techniques	– Listening and Observation – Problem based – learning – Seminar based learning	– Exams – Daily preparation
3	2	List and understand the various types of computer memory.	Programmed Input/ Output Techniques		
4	2	Understanding the interrupt and its types	Interrupt technique		
5	2	Arranging different kinds of storage is present on a computing device based on the speed of access.	Direct memory access technique		
6	2	Summarize what is meant by basic computer architecture.	The 8259A Programmable Interrupt Controller		
7	2	Describe the mapping methods of data and instructions pulled from the RAM to cache memory.	Memory system Memory Hierarchy		
8	2	Describe the concept of the associative memory and its applications	Associative Memory		
9	2	Define the cache memory and its benefits	Cache Memory		
10	2	Define the cache memory and its benefits	Cache Memory Organizations		
11	2	Define the fully associative memory and its benefits	Fully associative mapping Direct mapping		
12	2	Identify the basic concept of using multiprocessor computers and their impact on performance enhancement.	Set-associative mapping Fetch and write mechanism		
13	2	Identify the basic concept of using multicore and multiprocessor	Multiprocessor system: Tightly coupled, loosely coupled		

		computers and their impact on performance enhancement.			
14	2	Multi programming System	Multi programming System		
15	2	Multi-Core Architecture	Multi-Core Architecture		

11. Course Evaluation	
- Daily preparation: 5 marks - Monthly exams: 20 marks - Seminar: 10 Marks - Quiz: 5marks - Final exam 60 marks	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Computer Organization and Architecture Design for Performance, tenth Edition William Stalling, Copyright © 2016, 2013, 2010 Pearson Education, Inc.
Main references (sources)	- Modern Computer Architecture and Organization Jim Ledin, Copyright Year: 2020 - Computer Architecture: Fundamentals and Principles of Computer Design. Joseph D. Dumas II · 2018
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://www.spiceworks.com/tech/tech-general/articles/what-is-computer-architecture/ https://www.javatpoint.com/computer-organizati and-architecture-tutorial

COMPUTER GRAPHICS COURSE DESCRIPTION

1. Course Name:	
Computer Graphics	
2. Course Code:	
CSC3533	
3. Semester / Year:	
Third Grade/ 1st/ 2024-2025	
4. Description Preparation Date:	
Third Grade/ 1st Oct. 2024	
5. Available Attendance Forms:	
In Class	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30/2	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Prof. Dr. Adnan J. Jabir Email: adnan.jabir@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	The main objective of this course is to introduce students to the fundamental concepts in computer graphics, including a range of computer graphics techniques and algorithms covering 2D graphics. It focuses on key algorithmic techniques, mathematical and programmatic foundations of computer graphics, including modeling and animating 2D and. Topics include digital image representation, two-dimensional shape representations (e.g. Lines, circles, and curves), geometrical transformations (e.g. rotations, scales, translations, reflection, shearing and combined transformation), the rasterization pipeline, ray tracing & visual perception.
9. Teaching and Learning Strategies	
Strategy	Using presentation programs in the classroom when giving lectures and compu programming in the laboratory for practical application using the C# environment. addition to documenting all the material given in the theoretical and practical parts Google Classroom.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Introduction to computer graphics	Introduction to the C# programming language environment and the tools it provides for dealing with computer graphics	Data show	quiz

2	4	Understanding the human visual system, computer image representation, color models, display devices, vector graphics, raster graphics, basic terms related to display devices.	Dealing with geometric shapes (point, line, and rectangle)	Data show	quiz
3	4	Understanding 2D graphics, graphics output primitives, basic geometric shapes, desired properties of line drawing algorithms, DDA line drawing algorithm	Dealing with geometric shapes (circle, arc, polygon, and curve)	Data show	quiz
4	4	Understanding line drawing algorithms (Bresenham line drawing algorithm and Mid-Point algorithm)	Modeling some 2D shapes (such as cube and grid)	Data show	quiz
5	4	Understanding circle drawing algorithms, circle properties, polar coordinate method, and circle symmetry property	Modeling some scenes (such as a smiling face, and drawing birds)	Data show	quiz
6	4	Understanding circle drawing algorithms (Bresenham circle drawing	Programming line drawing algorithms	Data show	quiz

		algorithm and Mid-Point algorithm)			
7	4	Curve definition, Bezier curves, types of Bezier curves (linear Bezier curves, quadratic Bezier curves, cubic Bezier curves), applications of curves	Programming circle drawing algorithms	Data show	quiz
8	4	Understanding basic 2D transformations (translate, scale, and shear)	Programming methods for drawing curved shapes	Data show	quiz
9	4	Understanding basic 2D transformations (reflection, rotation, composition, and affine transformations)	Dealing with basic 2D transformations	Data show	quiz
10	4	Introducing the concepts of 2D views (cuts, point cuts, and line cuts)	Modeling some complex geometric shapes using translation, scaling, rotation and reflection	Data show	quiz
11	4	Building hierarchical modeling of complex objects, scene diagrams, and transformation stacks	Modeling some scenes using basic transformations (such as drawing a butterfly)	Data show	quiz
12	4	Introducing the concepts of three-dimensional views, parallel	Introduction to OpenGL	Data show	quiz

		projection, perspective projection, and depth determination			
13	4	Understanding polygon representation of objects, meshes and surfaces	Drawing a 3D shape using OpenGL	Data show	quiz
14	4	Understanding basic 3D transformations (move, rotate, scale, reflect, shearing, and compound transformations	Dealing with basic 3D transformations	Data show	quiz
15	4	Mid-Exam	Mid-Exam + display of projects completed by students	Data show	quiz

11. Course Evaluation
Conducting a mid-term exam is 15%, class participation and attendance are 5%, preparing class tests and assignments is 5%, conducting a quarterly laboratory exam is 10%, activities and assignments inside the laboratory are 5%, conducting a final practical exam is 20%, and finally conducting a final theoretical exam is 40%.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1) "Fundamentals of Computer Graphics", S. Marschner, and P. Shirley, CRC Press (A K Peters), 2021. 2) "Computer Graphics: Principles and Practice", J. F. Hughes, A. V. Dam, M. McGuire, D. F. Sklar, J. D. Foley, S. K. Feiner, and K. Akeley, Addison-Wesley (Pearson Education), 2014.
Main references (sources)	1. Steve Marschner and Pete Shirley. Fundamentals of Computer Graphics. A K Peters, 2021. 2. John F. Hughes, Andries van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner, and Kurt Akeley. Computer Graphics: Principles and Practice. 2014.
Recommended books and references (scientific journals, reports...)	1) "Introduction to Computer Graphics". F. Klawonn, Springer-Verlag London, 2nd Edition, 2012.

	2) “OpenGL Programming Guide”, Addison-Wesley (Pearson Education), D. Shreiner, G. Sellers, J. Kessenich, B. Licea-Kane, 8th Edition, 2013.
Electronic References, Websites	1) https://www.coursera.org/learn/interactive-computer-graphics 2) https://www.sciencedirect.com/journal/computers-and-graphics 3)https://www.frontiersin.org/journals/computer-science/sections/computer-graphics-and-visualization

FUNDAMENTALS OF DATABASES COURSE DESCRIPTION

1. Course Name:	
Fundamentals of Databases	
2. Course Code:	
CSC3534	
3. Semester / Year:	
Third Grade/ First semester/ 2024 -2025	
4. Description Preparation Date:	
1-Oct-2024	
5. Available Attendance Forms:	
In Person / Attendance Sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 Hours / 2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Tareef Kamil, Mehdi G. Duaimi Email: tareef.mustafa@sc.uobaghdad.edu.iq, mehdi.k@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	1. Defining and explaining the fundamentals of database concepts. 2. Designing a database schema. 3. Executing SQL statements for data retrieval and manipulation. 4. Understanding the role of databases in applications. 5. Performing data modeling and schema design. 6. Optimizing query performance.
9. Teaching and Learning Strategies	
Strategy	Instructors aim to consolidate active learning and critical thinking by engaging students in practical activities such as designing database schemas, writing SQL queries, and solving real-world database challenges. The strategy encourages collaboration, independent problem-solving, and the use of technology tools to enhance the learning experience. This will be achieved through classes, interactive tutorials and by considering various types of lab. assignments: involving some activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Recognizing Database System Concepts	Database System Concepts	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
2	2	Perceiving Database Architecture	Database Architecture	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
3	2	Investigating Database Management System	Database Management System	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final

					Exam)
4	2	Examining Database Schema & Database Users	Database Schema & Database Users	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
5	2	Probing The Entity Relationship Data Model	The Entity Relationship Data Model	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
6	2	Plumbing Relational Integrity &The Enhanced E-R Model and Business Rules	Relational Integrity &The Enhanced E-R Model and Business Rules	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
7	2	Exploring Conceptual Design with the ER Model	Conceptual Design with the ER Model	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
8	2	Checking Queries and Updates in SQL	Queries and Updates in SQL	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
9	2	Inspecting The Relational Data Model	The Relational Data Model	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
10	2	Grasp Mapping from ER Diagrams to Relational Model	Mapping from ER Diagrams to Relational Model	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
11	2	Testing SQL and DBMS Functionality	SQL and DBMS Functionality	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
12	2	Realize Defining a Relation Schema in SQL	Defining a Relation Schema in SQL	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
13	2	Examining Relational Algebra Syntax and Semantics	Relational Algebra Syntax and Semantics	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)
14	2	Recognizing Relational Algebra Queries	Relational Algebra Queries	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)

15	2	Preparing before the final Exam	Preparatory week before the final Exam	Lecture, Lab, Tutorial, Practice, Seminar	Quiz, Assignment Projects, (Midterm &Final Exam)

11. Course Evaluation	
Assignments: 15%, Projects / Lab.: 10%, Report: 5%, Midterm Exam: 10%, Final Exam: 50%, Total assessment: 100%	
12. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	➢ Raghu Ramakrishnan , Johannes Gehrke, "Database Management Systems", 4th Edition, McGraw Hill, 2018. ➢ S. Sumathi, S. Esakkirajan, "Fundamentals of Relational Database Management Systems", Springer, 2007.
Main references (sources)	➢ David M. Kroenke, David J. Auer. “Database processing: fundamentals, design, and implementation.”—Edition 15, Pearson Education, Prentice Hall. 2018.
Recommended books and references (scientific journals, reports...)	➢ Mike McGrath. ‘Access in easy steps: Illustrated using Access 2019 Paperback. In Easy Steps Limited (2019).
Electronic References, Websites	➢ https://www.inderscience.com/jhome.php?jcode=ijiids ➢ https://www.sciencedirect.com/topics/immunology-and-microbiology/database-management-system

WEB ORGANIZATION COURSE DESCRIPTION

1. Course Name:
Web Organization
2. Course Code:
CSC3535
3. Semester / Year:
Third Grade/ First Semester /2024-2025
4. Description Preparation Date:
1/10/2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
15 Hours Theoretical 30 Hours Practical ECTS credits:5
7. Course administrator's name (mention all, if more than one name)
Name: Lect. Mustafa S. Abd. Email: Mustafa.abd@sc.baghdad.edu.iq
8. Course Objectives

8. Course Objectives

The course **Web Organization** aims to achieve several goals:

1. Knowledge:

- Provide students with basic knowledge of how the web works.
- Introduce HTML, CSS, and JavaScript languages and their primary functions.
- Understand the principles and importance of Search Engine Optimization (SEO).
- Learn about Content Management Systems (CMS) and how to use them.
- Provide knowledge about web information security.

2. Skills:

- Master writing HTML and CSS code to create attractive web pages.
- Write JavaScript scripts to make web pages interactive.
- Create a website using a content management system.
- Optimize websites for search engines.
- Write reports on topics related to web organization.

3. Values:

- Adhere to ethical principles in design and programming.
- Strive to make websites accessible and user-friendly for all.
- Be aware of the importance of web information security.
- Pursue continuous learning and professional development.

4. 21st Century Skills:

- Develop problem-solving and critical thinking skills.
- Enhance communication and collaboration skills.
- Foster creativity and innovation.
- Equip students with effective technology usage skills.

5. Job Market Skills:

- Prepare students for the job market in web development.

- Provide students with skills applicable across internet-based fields.
- Enhance workplace communication and teamwork skills.

9. Teaching and Learning Strategies

- Theoretical and practical lectures using the latest presentation and teaching methods.
- Academic discussions of lecture content.
- Practical training.
- Projects and homework.

10. Course Structure

Week	Hours (Theory + Practical)	Learning Outcomes	Unit & Topic	Learning Method	Evaluation Method
1	1 Theory + 2 Practical	Introduction to the Web, HTML	Web definition, HTTP/HTTPS, URL structure	Lectures + Practical	Theoretical & practical exams
2	1 + 2	Web Structure Fundamentals	Web design, site planning, goals, audience analysis, resources	Lectures + Practical	Exams & lab evaluations
3	1 + 2	Web Portals	Site map, storyboard, hosting, domain, publishing	Lectures + Practical	Exams & lab evaluations
4	1 + 2	SEO & Keyword Strategy	Search engines, crawlers, meta tags, keywords	Lectures + Practical	Exams & lab evaluations
5	1 + 2	Topics in Web Design	HTML/XHTML, CSS, JavaScript, server-side, XML, Ajax	Lectures + Practical	Exams & lab evaluations
6	1 + 2	Basic Site Maps	Site types, URLs, browser compatibility, linking	Lectures + Practical	Exams & lab evaluations
7	1 + 2	Advanced Web Design	Tables, forms, standards, attributes	Lectures + Programming	Exams & lab evaluations
8	1 + 2	Sending/Receiving Data	POST & GET methods, HTML5, encoding	Lectures + Practical	Exams & lab evaluations
9	1 + 2	Midterm Exam	Chapters 1–3	Lectures + Practical	Midterm assessment
10	1 + 2	Web Design with CSS	CSS benefits, rules, values	Lectures + Practical	Exams & lab evaluations
11	1 + 2	CSS Subroutines	Attaching styles, cascade conflicts	Lectures + Practical	Exams & lab evaluations
12	1 + 2	Advanced CSS Rules	Specificity, importance, box model	Lectures + Practical	Exams & lab evaluations

13	1 + 2	Webpage Types	Page layout, liquid/fixed/elastic designs	Lectures + Practical	Exams & lab evaluations
14	1 + 2	IA & Usability	Info architecture, evaluation, usability testing	Lectures + Practical	Exams & lab evaluations
15	1 + 2	Final Exam	Comprehensive final exam	Lectures + Practical	Final exam

11. Course Evaluation
Daily quizzes, monthly exams, ongoing practical evaluations in the lab. • **Coursework:** 40% • **Final Exam:** 60%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- Sklar, Joel. Principles of web design: the web technologies series. Cengage Learning, 2011. 2- Beaird, Jason, Alex Walker, and James George. The principles of beautiful web design. Sitepoint, 2020.
Main references (sources)	

HTML & CSS	• Websites:
	  ○ W3Schools
	  ○ Mozilla Developer Network (MDN)
	• Books:
	  ○ *Head First HTML and CSS* by Elisabeth Robson and Eric Freeman
	  ○ *Dive into HTML5 & CSS3* by Mark Pilkington and Elliotte Rusty Harold

JavaScript	• Websites:
	  ○ FreeCodeCamp
	  ○ Khan Academy
	• Book:
	  ○ *Eloquent JavaScript* by Marijn Haverbeke

3. Recommended References	• Various academic research papers available online.
4. Electronic Resources	• W3Schools

SOFTWARE ENGINEERING COURSE DESCRIPTION

1. Course Name:	
Software engineering	
2. Course Code:	
CSC3536	
3. Semester / Year:	
Third Grade/ First semester / 2024-2025	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
In class	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 / 2	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Tareq Zaid Hammood Email: tarik.z@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	• Teaching the Skills of Software Engineering • Preparing Students for the SW market
9. Teaching and Learning Strategies	
Strategy	• Theoretical and practical lectures using modern presentation techniques. • Students participate in scientific discussions through brainstorming to obtain the required conclusions. • Practical training through projects and homework.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to Software Engineering	Introduction to Software Engineering	White board and data show	Discussion and daily exam
2	2	Software Process	Software Process	White board and data show	Discussion and daily exam
3	2	Types of SW requirements	Types of SW requirements	White board and data show	Discussion and daily exam
4	2	Requirements Engineering Process	Requirements Engineering Process	White board and data show	Discussion and daily exam
5	2	Functional and Nonfunctional	Functional and Nonfunctional	White board and	Discussion and daily

		Requirements	Requirements	data show	exam
6	2	Software Design Process	Software Design Process	White board and data show	Monthly exam
7	2	Software Development Process Models	Software Development Process Models	White board and data show	Discussion and daily exam
8	2	The Waterfall Model	The Waterfall Model	White board and data show	Discussion and daily exam
9	2	V-Shaped Model	V-Shaped Model	White board and data show	Discussion and daily exam
10	2	Evolutionary Development Model	Evolutionary Development Model	White board and data show	Discussion and daily exam
11	2	Incremental Model Life Cycle	Incremental Model Life Cycle	White board and data show	Discussion and daily exam
12	2	Object oriented software engineering	Object oriented software engineering	White board and data show	Monthly exam
13	2	Object oriented software engineering	Object oriented software engineering	White board and data show	Discussion and daily exam
14	2	Advanced software engineering	Advanced software engineering	White board and data show	Discussion and daily exam
15	2	Advanced software engineering	Advanced software engineering	White board and data show	Discussion and daily exam

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 Report and homework 20% Daily exam and attendance 10% Exams 70%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Software Engineering 10th Edition by Ian Sommerville**
Main references (sources)	**Software Engineering 10th Edition by Ian Sommerville, ISBN 978-0133943030**
Recommended books and references (scientific journals, reports...)	1. Clean Code by Robert C. Martin 2. Design Patterns by Gang of Four
Electronic References, Websites	https://software-engineering-book.com/

INTRODUCTION TO AI COURSE DESCRIPTION

1. Course Name:	
Introduction to AI	
2. Course Code:	
CSC3537	
3. Semester / Year:	
Third Grade/ First semester/2024-2025	
4. Description Preparation Date:	
01-10-2024	
5. Available Attendance Forms:	
Weekly Attendance Form	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Prof. Dr. Rawaa Dawoud Al-Dabbagh Email: rawaa.hassan @sc.uobaghdad.edu.iq Name: Dr. Dhuha Abdulhadi Abduljabbar Email: dhuha.abd@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	• Provide an overview of fundamental AI concepts, including machine learning, natural language processing, robotics, expert systems, and more. • Explore various AI algorithms and techniques, such as search algorithms, knowledge representation, and optimization methods. • Familiarize students with AI programming languages (e.g., Python) and tools commonly used in AI development. Provide hands-on experience in implementing AI algorithms. • Develop problem-solving skills in the context of AI applications. Encourage students to analyze real-world problems and devise AI-based solutions.
9. Teaching and Learning Strategies	
Strategy	**1.** Lectures: Traditional lectures can be used to introduce foundational concepts, theories, and algorithms in AI. Lectures can incorporate visual aids, examples, and case studies to enhance understanding. **2.** Practical Coding Assignments: Assigning coding assignments that involve implementing AI algorithms and techniques allows students to gain hands-on experience. They can work with programming languages such as Python. **3.** Group Projects: Encouraging students to work in groups on AI projects promotes collaboration, problem-solving, and teamwork. Projects can involve tasks like developing a chatbot, building a recommendation system, or designing an image recognition system. **4.** Case Studies: Analyzing real-world case studies that demonstrate the application of AI techniques in various domains (e.g., healthcare,

		finance, or transportation) helps students understand practical challenges and ethical considerations.			
10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	**2**	To explain the foundational concepts of AI and analyze the structure and behavior of intelligent agents in various environments.	**Introduction to AI** Definition and history of AI. Types of AI: Narrow AI vs. General AI. Applications of AI in various domains.	**Lectures**	**Daily Preparation & Participation**
2	**2**		**Intelligent Agents** Agents and Environments	**Lectures**	**Daily Preparation & Participation**
3	**2**	To Describe the fundamental components of state space search and compare various uninformed and informed search strategies based on their efficiency and applicability.	**Fundamental Components of State Space Search** Structures of State Space Search Graph Theory The State Space Representation of Problems	**Lectures**	**Daily Preparation & Participation**
4	**2**		**Strategies for State Space Search** Breadth-First Search (BFS) algorithm: principles and applications. Depth-First Search (DFS) algorithm.	**Lectures**	**Quiz**
5	**2**		**Strategies for State Space Search** Iterative-Deepening Search Node relaxation	**Lectures**	**Monthly Exam**
6	**2**		**Strategies for State Space Search** Dijkstra's algorithm Multiple Start Points	**Lectures**	**Daily Preparation & Participation**
7			**Midterm Exam**		

8	**2**	To construct and evaluate heuristic functions and apply Greedy Best-First Search and A* Search algorithms to solve AI games and pathfinding and optimization problems efficiently.	**Heuristic Functions and Greedy Best-First Search** Introduction to heuristic functions. Greedy Best-First Search algorithm. Applications and limitations of Greedy Search.	**Lectures**	**Daily Preparation & Participation**
9	**2**		**A* Search Algorithm** Overview of A* Search. Admissibility and consistency of A* heuristic. Optimality of A* and its applications.	**Lectures**	**Quiz**
10	**2**	To analyze adversarial search strategies and apply algorithms such as Minimax and Alpha-Beta pruning to decision-making problems in competitive environments like games.	**Adversarial Search** Introduction to adversarial search. Minimax algorithm: principles and implementation. Hands-on session: Simulating and visualizing adversarial games.	**Lectures**	**Daily Preparation & Participation**
11	**2**		**Alpha-Beta Pruning** Understanding Alpha-Beta Pruning for optimization. Implementation of Alpha-Beta Pruning in adversarial search. Comparing the performance of Minimax with and without Alpha-Beta Pruning.	**Lectures**	**Daily Preparation & Participation**
12	**2**	To compare uninformed and informed search algorithms in terms of performance and suitability and evaluate their effectiveness through real-world	**Comparison and Evaluation** Comparing uninformed and informed search algorithms. Real-world applications and case studies.	**Lectures**	**Daily Preparation & Participation**

		applications and case studies.			
13	**2**	To define a clear AI project scope, identify relevant problem domains, and formulate appropriate objectives, datasets, and methodologies to initiate a structured AI development process.	**AI Project Kickoff** Overview of the AI project. Selecting a problem domain. Planning and scoping the project.	**Lectures**	**Final Project / Case Study**
14	**2**	To identify key ethical issues in AI, such as bias, privacy, transparency, and accountability, and evaluate the societal impacts of AI technologies and decision-making systems.	**Ethical Considerations in AI** Importance of ethics in AI. Ethical guidelines and responsible AI development. Group discussions on ethical dilemmas.	**Lectures**	**Quiz**
15	**2**	To effectively present their AI project outcomes, demonstrating their ability to apply AI concepts and techniques	**Final Project Presentation** Project presentations. Reflective essays on project experiences.	**Group Projects**	**Final Project / Case Study**
16			**Preparatory week before the final exam**		
Course Structure (Practical Part)					
Week	**Hours**	**Required**	**Unit or subject name**	**Learning**	**Evaluation**

		Learning Outcomes		method	method
1	**2**	Students will understand Python fundamentals, set up a development environment, and write basic scripts for problem-solving.	**Python Basics and Setup** Introduction to Python programming. Setting up the Python environment for AI development. Basic Python syntax, data types, and control structures.	**Practical-Based Learning**	**Daily Preparation & Participation**
2	**2**		**AI Lab Orientation** Overview of the AI Lab projects. Introduction to tools and resources for AI development. Collaborative tools setup.	**Practical-Based Learning**	**Daily Preparation & Participation**
3	**2**	Students will implement BFS, and DFS, to analyze graph traversal strategies and optimize search efficiency.	**Implementing Breadth-First Search (BFS)** Understanding BFS algorithm. Hands-on: Coding BFS in Python.	**Practical-Based Learning**	**Daily Preparation & Participation**
4	**2**		**Depth-First Search (DFS) and Uniform Cost Search (UCS)** Practical implementation of DFS and UCS. Debugging and optimizing search algorithms in Python.	**Practical-Based Learning**	**Assignments**
5	**2**	Students will implement Dijkstra's Algorithm to efficiently determine the shortest path in weighted graphs, enhancing real-world path planning and optimization skills.	**Uniform search Algorithms** Dijkstra's Algorithm	**Practical-Based Learning**	**Assignments**
6	**2**		**Implementing Dijkstra's Algorithm in path planning**	**Activity-Based Learning**	**Assignments**

7			**Midterm Exam**		
8	**2**	Students will develop expertise in A* Search, integrating heuristic-based pathfinding to optimize navigation in complex environments.	**Implementing A* Search Algorithm** Overview of A* algorithm. Hands-on: Coding A* Search in Python.	**Practical-Based Learning**	**Daily Preparation & Participation**
9	**2**		**Implementing A* Search Algorithm in AI games**	**Activity-Based Learning**	**Daily Preparation & Participation**
10	**2**		**Implementing A* Search Algorithm in path planning**	**Activity-Based Learning**	**Assignments**
11	**2**	Students will implement Minimax and Alpha-Beta Pruning to enhance decision-making in adversarial search, optimizing computational efficiency in game-playing AI.	**Minimax Algorithm** Introduction to adversarial search. Minimax algorithm: principles and implementation in Python.	**Practical-Based Learning**	**Daily Preparation & Participation**
12	**2**		**Alpha-Beta Pruning** Understanding Alpha-Beta Pruning for optimization. Implementation of Alpha-Beta Pruning in adversarial search.	**Practical-Based Learning**	**Assignments**
13	**2**	Students will explore advanced adversarial search techniques	**Advanced Topics in Adversarial Search** Extensions and variations of adversarial search algorithms. Practical coding exercises exploring variations in game scenarios.	**Activity-Based Learning**	**Assignments**
14	**2**	Students will design and implement AI-driven projects, applying	**Project Work** Hands-on coding sessions for the group project. Group discussions and consultations.	**Activity-Based Learning**	**Assignments**

15	**2**	theoretical knowledge to solve real-world problems.	**Project Presentations and Reviews** Group presentations of final projects.	**Activity-Based Learning**	**Assignments**
16	**2**		**Preparatory Week before the Final Exam**		

11. Course Evaluation

Daily Preparation & Participation + Quizzes (5)
Monthly Exams (10)
Midterm Exam (10)
Practical Part (15)

Total = (40) + Final Exam (60) = (100)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Nilsson, N. J. (1998). *Artificial intelligence: Structures and strategies for complex problem solving* (5th ed.). Pearson. Russell, S., & Norvig, P. (2010). *Artificial intelligence: A modern approach* (3rd ed.). Pearson. Poole, D. L., & Mackworth, A. K. (2017). *Artificial Intelligen Foundations of Computational Agents*. Cambridge University Press.
Recommended books and references (scientific journals, reports...)	Mitchell, M. (2019). *Artificial intelligence: A guide for thinking huma* Farrar, Straus and Giroux.
Electronic Referenc Websites	**Coursera AI Courses (https://www.coursera.org/courses?query=artificial%20intelligence)**

PROGRAMMING WITH JAVA COURSE DESCRIPTION

1. Course Name:	
Programming in Java	
2. Course Code:	
CSC3538	
3. Semester / Year:	
Third Grade/ first semester/ 2024-2025	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
In person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
45 credit hours / 2 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr Haneen Ahmed Email: haneen.a@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	● Learn about the Java programming method and its capabilities ● Learn the basics of the Java language ● Identify the libraries provided by the language ● Design and implement graphical user interfaces that respond to events ● Dealing with files
9. Teaching and Learning Strategies	
Strategy	- Providing the student with the basics of the topics - Discussions and problem solving during the lecture - Asking intellectual questions, such as why and how - Giving assignments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1 theoretical + 2 practical	Introduction to java Programming	Introduction to java Programming	lectures	Midterm exam Daily evaluations
2	1 theoretical + 2 practical	Java Fundamentals	Java Fundamentals	lectures	Midterm exam Daily evaluations
3	1 theoretical + 2 practical	Principles of object-oriented programming	Principles of object-oriented programming	lectures	Midterm exam Daily evaluations
4	1 theoretical + 2 practical	Introducing Classes, Objects, and Methods	Introducing Classes, Objects, and Methods	lectures	Midterm exam Daily evaluations
5	1 theoretical	GUIs in Java	GUIs in Java	lectures	Midterm exam

	+ 2 practical				Daily evaluations
6	1 theoretical + 2 practical	Java AWT Java Swing toolkit and widgets	Java AWT Java Swing toolkit and widgets	lectures	Midterm exam Daily evaluations
7	1 theoretical + 2 practical	GUI Components	GUI Components	lectures	Midterm exam Daily evaluations
8		Exam	Exam	lectures	Midterm exam Daily evaluations
9	1 theoretical + 2 practical	Exception Handling	Exception Handling	lectures	Midterm exam Daily evaluations
10	1 theoretical + 2 practical	Input/output and files	Input/output and files	lectures	Midterm exam Daily evaluations
11	1 theoretical + 2 practical	Input/output and files	Input/output and files	lectures	Midterm exam Daily evaluations
12	1 theoretical + 2 practical	Java Collections	Java Collections	lectures	Midterm exam Daily evaluations
13	1 theoretical + 2 practical	Random number	Random number	lectures	Midterm exam Daily evaluations
14	1 theoretical + 2 practical	Introduction client server programming	Introduction client server programming	lectures	Midterm exam Daily evaluations
15	1 theoretical + 2 practical	Network programming	Network programming	lectures	Midterm exam Daily evaluations

11. Course Evaluation	
- Monthly exams 20% - Preparing reports 5% - Laboratory evaluation 15% - final exam 60%	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Cay S. Horstmann, **Core Java Volume I – Fundamentals**, 11th Edition, Prentice Hall Herbert Schildt, **Java - The Complete Reference**, 11th Editi McGraw Hill Education
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Cay S. Horstmann, **Core Java Volume I – Fundamentals**, 11th Edition, Prentice Hall Herbert Schildt, **Java - The Complete Reference**, 11th Editi McGraw Hill Education
Electronic Referenc Websites	https://www.tutorialspoint.com/java/index.htm

ENGLISH LANGUAGE COURSE DESCRIPTION

1. Course Name:	
English Language	
2. Course Code:	
CSC3539	
3. Semester / Year:	
Third Grade/ First Semester / 2024–2025	
4. Description Preparation Date:	
October 1st, 2024	
5. Available Attendance Forms:	
Mandatory in-person attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30/2	
7. Course administrator's name (mention all, if more than one name)	
Asst. Prof. Dr. Ahmed Hashim Hussein	
8. Course Objectives	
Course Objectives	To review previously learned English language skills and add new vocabul and skills that support the student in their academic studies and in develop their language abilities.
9. Teaching and Learning Strategies	
Strategy	- Improve reading skills - Write formally and informally in English - Add new vocabulary - Improve English speaking skills - Improve English grammar

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Auxiliary verbs and tenses Auxiliary verbs and negatives Auxiliary verbs and questions Auxiliary verbs and short answers	Unit 1	Data show and white board	Daily quiz Homework
2	2	Present simple adverbs of frequency Present continuous State verbs The passive	Unit 2	=	=
3	2	Past tenses Past simple Past continuous Past simple or past continuous	Unit 3	=	=
4	2	Used to Past Perfect Past tenses in the passive	Unit 3	=	=

5	2	Have to Model and related verbs	Unit 4	=	=
6	2	Obligation: should, ought to, and must Permission: can and be allowed	Unit 4	=	=
7	2	Making requests: can, could, will, and would Making offers: will and should	Unit 4	=	=
8	2	First written exam			
9	2	Future forms will / going to and Present continuous	Unit 5	=	=
10	2	will / going to and Present continuous Future possibility: may/ might / could	Unit 5	=	=
11	2	Information questions what …. like ? How? Adjectives and nouns that go together	Unit 6	=	=
12	2	Compound adjectives Adverbs and verbs that go together Adverbs that don't end in -ly	Unit 6	=	=
13	2	Present Perfect simple Present Perfect continuous Present Perfect passive	Unit 7	=	=
14	2	Present Perfect or past simple Present Perfect simple passive Present Perfect continuous Present Perfect simple or continuous	Unit 7	=	=
15	2	Second written exam			

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)	English Language Handbook
Main references (sources)	Learn Fundamentals in English Language
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://pzs.dstu.dp.ua/DataMining/bibl/Data%20Mining%20Techniques%20For%20Marketing%20Sales%20And%20Customer%20Relationship%20Management%202Ed.pdf

Third Grade – Second Semester

MOBILE COMPUTING COURSE DESCRIPTION

1. Course Name:	
Mobile Computing	
2. Course Code:	
CSC3640	
3. Semester / Year:	
2nd Semester/ 3rd Grade/ Academic Year 2024-2025	
4. Description Preparation Date:	
1/oct/2024	
5. Available Attendance Forms:	
Physical attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
1 theoretical hour (weekly) (15) + 2 practical hours (weekly) (30)/ Two units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Alyaa Mohammed Noori Idan Al-Barrak Email: Alyaa.al-barrak@sc.uobaghdad.edu.iq	
8. Course Objectives	
a. Preparing specialists who are familiar with the basics of mobile phone computing in theory and practice and who can fill the needs of the labor market. b. Cooperating with state institutions and the private sector by providing scientific advice and consultations.	• Conducting scientific research and trying to keep pace with scientific development.
9. Teaching and Learning Strategies	
i. Theoretical lectures in class, in addition to downloading PDF files into the electronic class for reference when needed. ii. Practical lectures in the laboratory in addition to electronic classes for practical mobile phone computing iii. Educational videos via the official YouTube channel iv. Recorded lectures for Google Mate that are uploaded to the electronic classroom, recorded from past years. v. Electronic books and lectures that can be consulted.	
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First Week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Introduction to Mobile computing	Attending a theory lecture	Daily and monthly exam and homework
2nd week	1	Understanding the lecture from a theoretical perspective, future	Application of	Attending a theory lecture	Daily and monthly

		and practical developments, and their impact on the student's professional aspect and market requirements	Mobile Application and Limitations		exam and homework
3rd week	1	Be prepared for the frequent exams	1st exam	In-person examination	
4th week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Multiplexing Types	Attending a theory lecture	Daily and monthly exam and homework
5th week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	CDMA working examples	Attending a theory lecture	Daily and monthly exam and homework
6th week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Mobile computing Network	Attending a theory lecture	Daily and monthly exam and homework
7th week	1	Be prepared for the frequent exams	Second Exam	In-person examination	
8th week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Mobile generations	Attending a theory lecture	Daily and monthly exam and homework
9th week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	A simplified reference model	Attending a theory lecture	Daily and monthly exam and homework
10th week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Introduction to GSM	Attending a theory lecture	Daily and monthly exam and homework
11th	1	Understanding the lecture from a	GSM	Attending a	Daily and

week		theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Architecture	theory lecture	monthly exam and homework
12th week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	GSM Architecture	Attending a theory lecture	Daily and monthly exam and homework
13th week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	GSM Services	Attending a theory lecture	Daily and monthly exam and homework
14th week	1	Be prepared for the frequent exams	Third Exam	In-person examination	
15th week	1	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	revision	Attending a theory lecture	Daily and monthly exam and homework

11. Course Evaluation
• Quarterly attendance exams (3 exams are conducted and the two highest grades are chosen) • Daily exams out of 10 and the best ones are selected • Take the practical exams more than twice and choose the highest grade among them • An assignment that gives a class time to submit.

12. Learning and Teaching Resources	
Required textbooks (curricular books, any)	Asoke K Talukder (Author), Roopa Yavagal, "Mobile Computing: Technology, Applications, and Service Creation" McGraw Hill; 1st edition (November 16, 2006).
Main references (sources)	Charles Harper, "Mobile Computing." (2022)
Recommended books and references (scientific journals, reports...)	Pattnaik, P.K. and Mall, R., 2015. Fundamentals of Mobile Computing. PHI Learning Pvt. Ltd.
Electronic References, Websites	www.geeksforgeeks.org

CRYPTOGRAPHY COURSE DESCRIPTION

1. Course Name:	
Cryptography	
2. Course Code:	
CSC3641	
3. Semester / Year:	
Third Grade/ 2nd Semester/ 2024-2025	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
Mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hrs./3 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Sarab M. Hameed Email: sarab.m@sc.uobaghdad.edu.iq Name: Dr. Sumaya S. Sulaiman Email: sumasaad@uomustansiriyah.edu.iq	
8. Course Objectives	
Course Objectives	Understand the core objectives of cryptography and its applications in ensuring confidentiality, integrity, authentication, and non-repudiation. Analyze and apply classical cryptographic techniques, including substitution and transposition ciphers, and evaluate their strengths and weaknesses. Apply essential mathematical foundations Understand the structure and operations of symmetric key cryptographic algorithms, Comprehend the principles of public key cryptography, with a focus on RSA and the Diffie-Hellman key exchange protocol. Evaluate the performance, security, and practical constraints of various cryptographic algorithms and identify potential vulnerabilities and attack vectors.
9. Teaching and Learning Strategies	
Strategy	Delivering lectures to introduce and explain essential concepts and principles of cryptography. Giving hands-on programming exercises helps them to apply the learned algorithms. Providing code walkthroughs and examples demonstrating the implementation of various cryptographic algorithms. Encouraging group projects and activities among students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understand the purpose and goals of cryptography. Identify real-world applications	Introduction to Cryptography	Lecture, PowerPoint	Oral questions Classroom

		of cryptographic techniques			discussion
2	2	Encrypt and decrypt messages using substitution ciphers. Analyze vulnerabilities in basic substitution techniques.	Classical Cryptography – Part 1	Lecture, PowerPoint	Oral questions Classroom discussion
3	2	Apply polyalphabetic ciphers and transposition ciphers. Understand the differences between substitution and transposition.	Classical Cryptography – Part 2	Lecture, PowerPoint	Oral questions Daily Quiz
4		Perform arithmetic operations in modular systems. Understand the importance of modular arithmetic in cryptography. Compute GCD using Euclidean algorithm. Find modular inverses and apply them in cipher algorithms	Mathematics for Cryptography – Part 1	Lecture, PowerPoint	Oral questions Classroom discussion
5	2	Apply Euler's and Fermat's theorems in cryptographic proofs. Understand the difficulty of factorization and its cryptographic implications.	Mathematics for Cryptography – Part 2	Lecture, PowerPoint	Oral questions Classroom discussion
6		Describe how OTP achieves perfect secrecy. Discuss why OTP is not widely used in practice.	One-Time Pad (OTP)	Lecture, PowerPoint	Oral questions Classroom discussion
7	2		Exam		
8	2	Describe DES operation and key structure. Analyze DES security and known vulnerabilities.	Symmetric Key Cryptography – DES	Lecture, PowerPoint	Oral questions Classroom discussion
9	2	Explain the design and motivation behind 2DES and 3DES. Compare DES, 2DES, and 3DES in terms of security and performance.	2DES and 3DES	Lecture, PowerPoint	Oral questions Daily Quiz
10	2	Describe the initial stages of AES encryption. Understand non-linear substitutions and row shifts.	AES – Part 1	Lecture, PowerPoint	Oral questions Classroom discussion

11	2	Explain the role of MixColumns and AddRoundKey. Perform AES key scheduling.	AES – Part 2	Lecture, PowerPoint	Oral questions Classroom discussion
12	2	Implement encryption and decryption using S-AES. Understand how simplified models represent full AES functionality.	Simplified AES (S-AES)	Lecture, PowerPoint	Oral questions Classroom discussion
13	2	Perform RSA key generation and encryption/decryption. Apply RSA in a simple secure communication scenario.	Public Key Cryptography (RSA)	Lecture, PowerPoint	Oral questions Daily Quiz
14	2	Demonstrate how the Diffie-Hellman protocol works. Recognize the importance and limitations of key exchange methods.	Diffie-Hellman Key Exchange	Lecture, PowerPoint	Oral questions Classroom discussion
15	2	Exam	A preparatory week before the Final Exam	Lecture, PowerPoint	Oral questions Classroom discussion

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)	Jonathan Katz And Yehuda Lindell, Introduction To Modern Cryptography, Second Edition, Taylor & Francis Group, 2015. Christof Paar and Jan Pelzl, Understanding Cryptography A Textbook for Students and Practitioners, Springer-Verlag Berlin Heidelberg, 2010. Bruce Schneier, Applied Cryptography
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Crypto101.io https://cryptobook.nakov.com/

OPERATING SYSTEM I COURSE DESCRIPTION

1. Course Name:	
Operating System I	
2. Course Code:	
CSC3642	
3. Semester / Year:	
Third Grade/ 2024-2025 Second semester	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 Hours / 2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name:Dr. Nada A.Z. Abdullah Email: nada.abdullah@sc.uobaghdad.edu.iq Name: Dr. Mariam A. Yasir Email : maryam.a@sc.uobghdad.edu.iq	
8. Course Objectives	
Course Objectives	1. Recognize the importance of operating systems. 2. Recognize how the applications interact with the operating system as the later working as intermediary program between the machines and the application. 3. Know how the operating systems transport the application requests to hardware. 4. Understand how operating systems managing resources such as processors, memory and I/O. 5. Realize the efficiency or the deficiency of the different techniques used by some operating systems.
9. Teaching and Learning Strategies	
Strategy	1. Attend Lectures: Regularly attend lectures to grasp the foundational concepts and understand the material presented by the instructor. 2. Take Detailed Notes: Take thorough and organized notes during lectures to aid in comprehension and review later. 3. Read the Textbook: Read the recommended textbook to gain additional insights, explanations, and examples related to operating systems. 4. Engage in Discussions: Participate in class discussions, group study sessions, or online forums to exchange ideas. 5. Complete Assignments and Projects: Actively engage in practical assignments and projects to apply theoretical concepts and enhance student hands-on skills. 6. Practice with Sample Problems: Solve sample problems and practice exercises provided by the instructor or in the textbook to reinforce

	student understanding. 7. Utilize Online Resources: Make use of online tutorials, educational websites, and video lectures to supplement student learning and explore different perspectives on the topics. 8. Create Concept Maps or Diagrams: Visualize complex concepts by creating concept maps or diagrams to establish connections and enhance understanding. 9. From Study Groups: Collaborate with classmates to discuss challenges topics, solving problems collectively, and sharing different perspectives.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understanding OS Overview	Operating System Overview	White board+ Data show	Oral exam
2	2	Remember the Computer system components	Computer system components	White board+ Data show	Oral exam
3	2	Understand the Interrupts	Interrupts	White board+ Data show	Oral exam
4	2	Know the different types of Input output devices	Input output devices	White board+ Data show	Oral exam
5	2	Exam1	Exam1		Written
6	2	Understand Process	Process	White board+ Data show	Oral exam
7	2	How the Process creation and termination is performed	Process creation and termination	White board+ Data show	Oral exam
8	2	Understand Process scheduling	Process scheduling	White board+ Data show	Oral exam
9	2	What is IPC	IPC	White board+ Data show	Oral exam
10	2	Message System	Message System	White board+ Data show	Oral exam

11	2	Exam2	Exam2		Written
12	2	Know the types of Scheduling algorithms	Scheduling algorithms	White board+ Data show	Oral exam
13	2	Know how the FCFS, SJF, and Priority work	FCFS, SJF, Priority	White board+ Data show	Oral exam
14	2	Know how the Round robin , and Multi queue scheduling work	Round robin, Multi-level queue scheduling	White board+ Data show	Oral exam
15	2	Exam3	Exam		Written

11. Course Evaluation

- Daily exams
- Participation degrees in answering questions during the lecture
- Monthly exams
- Reports
- Seminars

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Silberschatz, Galvin, Gagne. Operating System Concepts. John Wiley & sons , inc 2018
Main references (sources)	Operating systems design and implementation, Andrew s. Tanenbaum, Prentice-Hall
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

COMMUNICATIONS AND NETWORKING COURSE DESCRIPTION

1. Course Name:	
Communications and Networking	
2. Course Code:	
CSC3643	
3. Semester / Year:	
Third Grade/ 2nd Sem / 2024-2025	
4. Description Preparation Date:	
1st Oct. 2024-2025	
5. Available Attendance Forms:	
Attendance Sheet/ In Person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Prof. Dr. Suhad Faisal, Lecturer. Dr. Zaid Hashim Email: suhad.f@sc.uobaghdad.edu.iq, Email: zaid.h@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	1. Working with networks often involves teamwork and collaboration. Students should enhance their communication skills and learn to collaborate effectively with peers in network design, implementation, and troubleshooting scenarios. 2.Through hands-on labs, projects, and case studies, students should develop critical thinking and analytical skills necessary to evaluate network architectures, identify optimization opportunities, and make informed decisions.
9. Teaching and Learning Strategies	
Strategy	1. Explaining the scientific material to students in detail 2. Students' participation in solving programming problems. 3. Discussion and dialogue about vocabulary related to the topic. 4. Use the electronic classroom (Google Classroom) to upload lectures in the form of PDF files (in short form), where their details are explained in the lecture, with many examples solved on the blackboard, discussion with students, and answers to their inquiries. 5. The electronic classroom is also used to give homework assignments and upl answers within the electronic classroom. The classroom is also used to announce ex dates and grades... etc.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	• Identify the basic components of a computer network (end devices, intermediary devices, media). • Describe the role and function of servers, clients, routers, switches, and access points. • Explain how devices interact to	Network Component	Data show	quiz

		form a functioning network.			
2	1	• Interpret logical and physical network diagrams. • Compare common physical topologies (star, bus, ring, mesh). • Understand the purpose of topology diagrams in network design and troubleshooting.	Network Representations and Topologies	Data show	quiz
3	1	Differentiate between LANs, WANs, MANs, PANs, and WLANs. • Identify scenarios appropriate for each network type. • □ Explain how networks differ in size, coverage, and function.	Common Types of Networks	Data show	quiz
4	1	• List common types of Internet connections (DSL, cable, fiber, satellite, cellular). • Describe the characteristics (speed, reliability, cost) of each connection type. • Explain how ISPs provide connectivity to end users.	Internet Connections	Data show	quiz
		First Exam			
5	1	• Identify characteristics of a reliable network (fault tolerance, scalability, QoS, security). • Explain the importance of redundancy and failover in network design. • Understand basic QoS concepts for different traffic types (voice, video, data).	Reliable Networks	Data show	quiz
6	1	• Discuss emerging trends such as virtualization, cloud computing, and SDN (Software Defined Networking). • Describe the role of IoT and mobile devices in modern networking. • Understand the impact of automation and AI on network operations.	Network Trends	Data show	quiz
7	1	• Define basic principles of	Network	Data	quiz

		network security (confidentiality, integrity, availability). • Identify common threats (malware, phishing, DoS attacks) and security measures (firewalls, encryption, authentication). • Understand the concept of defense-in-depth.	Security	show	
8	1	• Describe professional responsibilities of IT workers (ethics, communication, documentation). • Understand the importance of lifelong learning and certifications. • Demonstrate proper workplace behavior, safety, and customer service.	The IT Professional	Data show	quiz
		Second Exam			
9	1	• Access and configure a Cisco switch via console. • Configure basic settings (hostname, banners, passwords). • Assign IP addresses to end devices and verify connectivity.	Basic Switch and End Device Configuration	Data show	quiz
10	1	• Understand the purpose and functionality of the Cisco IOS (Internetwork Operating System). • Access IOS using terminal emulation programs. • Differentiate between user EXEC and privileged EXEC modes.	Cisco IOS Access	Data show	quiz
11	1	• Navigate between different IOS modes (global configuration, interface configuration). • Use context-sensitive help and command history. • Use basic IOS commands to configure and manage devices.	IOS Navigation	Data show	quiz
12	1	• Understand the syntax and structure of Cisco IOS commands. • Interpret command output and error messages. • Use proper command hierarchies and shortcuts for efficient configuration.	The Command Structure	Data show	quiz

		Final exam			
11. Course Evaluation					
60% (50% on the written final exam, 10% on the final lab exam), 40% on the course (5% on the attendance, 15% on the monthly exam, 5% on the quizzes, 15% on the lab.					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)					
Main references (sources)		1. Cisco Networking Academy 2024, https://www.netacad.com/courses/networking/ccna-introduction-networks. 2. Computer networking a top-down approach 5th edition, Kurose, Ross. 3. Data Communications and Networking by Behrouz A.Forouzan 5th edition. 4. CISCO websites, References.			
Recommended books and references (scientific journals, reports...)		Mastering Computer Networking: Essential Techniques Kindle Edition			
Electronic References, Websites					

RELATIONAL DATABASE COURSE DESCRIPTION

1. Course Name:	
Relational Database	
2. Course Code:	
CSC3644	
3. Semester / Year:	
Third Grade/ 2024-2025 Second semester	
4. Description Preparation Date:	
1-10-2024	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
15 Hours / 1 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Sarmad Makki, Mehdi G. Duaimi Email: Sarmad.garib@sc.uobaghdad.edu.iq, mehdi.k@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	1. Designing and creating relational database schemas. 2. Applying normalization techniques for data integrity. 3. Optimizing database performance. 4. Understanding transaction management, concurrency, and recovery control. 5. Integrating databases with applications. 6. Applying relational database knowledge to real-world scenarios.
9. Teaching and Learning Strategies	
Strategy	These strategies may include a mix of theoretical and practical approaches. Theoretical instructions involve lectures, presentations, and discussions to explain the concepts of relational databases. Also, Hands-on activities, such as individual and group exercises, assignments, and projects, should be incorporated to provide practical experience in designing, implementing, and querying databases. Case studies and real-world examples can help students understand how to apply their knowledge to solve actual problems. Additionally, interactive sessions, demonstrations, and workshops using popular database management systems and SQL tools can enhance the learning experience.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Introducing Database Design Theory and Methodology	Database Design Theory and Methodology	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
2	1	Exploring	Relational	Lecture, Lab,	Quizz, Assignment

		Relational Database Design & Implementation	Database Design & Implementation	Tutorial, Practice, Seminar	Projects,(Midterm &Final Exam)
3	1	Recognizing The Concept of Database Anomalies	The Concept of Database Anomalies	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
4	1	Perceiving Functional Dependencies	Functional Dependencies	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
5	1	Investigating Inference Rules for Functional Dependencies	Inference Rules for Functional Dependencies	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
6	1	Examining Normalization; Defining Normal Forms	Normalization; Defining Normal Forms	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
7	1	Seeking Basic and Further Normal forms	Basic and Further Normal forms	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
8	1	Checking Schema Refinement in Database Design	Schema Refinement in Database Design	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
9	1	Inspecting The Database Application System Life Cycle	The Database Application System Life Cycle	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
10	1	Grasping Schema and Transaction Design	Schema and Transaction Design	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
11	1	Probing Transaction management and concurrency control	Transaction management and concurrency control	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
12	1	Plumbing ACID properties of a transaction	ACID properties of a transaction	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)

13	1	Experimenting Database Transaction Execution	Database Transaction Execution	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
14	1	Realize Extended Database Design	Extended Database Design	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)
15	1	Reviewing the above topics	Review for the above topics	Lecture, Lab, Tutorial, Practice, Seminar	Quizz, Assignment Projects,(Midterm &Final Exam)

11. Course Evaluation
Assignments: 15%, Projects / Lab.: 10%, Report: 5%, Midterm Exam: 10%, Final Exam: 50%, Total assessment: 100%

12. Learning and Teaching Resources	
Required textbooks (curricu books, if any)	➢ Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", 4th Edition, McGraw Hill, 2018. ➢ S. Sumathi, S. Esakkirajan, "Fundamentals of Relational Database Management Systems", Springer, 2007.
Main references (sources)	➢ David M. Kroenke, David J. Auer. “Database processing: fundamentals, design, and implementation.”—Edition 15, Pearson Education, Prentice Hall. 2018.
Recommended books and references (scientific journals, reports...)	➢ Mike McGrath. ‘Access in easy steps: Illustrated using Access 2019 Paperback. In Easy Steps Limited (2019).
Electronic References, Websit	➢ https://www.inderscience.com/jhome.php?jcode=ijiids ➢ https://www.sciencedirect.com/topics/immunology-and-microbiology/database-management-system

DIGITAL IMAGE PROCESSING COURSE DESCRIPTION

1. Course Name:

Digital Image Processing

2. Course Code:

CSC3645

3. Semester / Year:

Third Grade/ **Second semester / 3rd class 2024-2025**

4. Description Preparation Date:

1/10/2024

5. Available Attendance Forms:

Morning and Evening attendance

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

4 hours (2 Theoretical / 2 Practical) / 3 Units

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

Name: Mohammed Sabbih Hamoud
Email: Mohammed.s@sc.uobaghdad.edu.iq
Name: Rafal Ali Sameer
Email: Rafal.a@sc.uobaghdad.edu.iq

8. Course Objectives

1. Enable students to define the scope of the field called digital image processing.
2. Knowledge of image processing in its space domain and in the frequency domain.
3. Discussing the methods used in this field, as well as knowing the basics of the digital image in terms of its composition, the processes of converting it into a digital image, and processing color and non-color digital images.
4. Using computer programming in the laboratory to clarify and achieve the above-mentioned goals using programming languages.
5. Discussing the basics of digital image compression and the algorithms used in this field.
6. Building applied projects that employ digital images for community service purposes.

9. Teaching and Learning Strategies

1. Explaining the scientific material to students in detail, having students participate in solving mathematical problems, and using the blackboard to explain and solve examples.
2. Use Power Point presentation programs in the classroom when giving lectures.
3. Discussion and dialogue about vocabulary related to the topic
4. Using computer programming in the laboratory for practical application using the C# environment.
5. Use the electronic platform Google Classroom to provide students with lectures.

10. Course Structure

Week	Hours (Theoretical and Practical)	Unit or subject name	Learning method	Evaluation method
1	4	- Imaging system - Source of Images - Image Digitization (Quantization and Sampling)	Data Show	Quiz

2	**4**	- Basic Operation on Digital image - Basics of Digital images - Image representation - Types and Format of digital image	Data Show	Quiz
3	**4**	- Relationship between pixels - Types of operation	Data Show	Quiz
4	**4**	- Mathematical operation on Digital image - Array and matrix operation - Linear and Nonlinear - Arithmetic and Logic operations - Convolution	Data Show	Quiz
5	**4**	- Image Histogram - Histogram Modification - Equalization -Global Features	Data Show	Quiz
6	**4**	- Frequency domain and filters	Data Show	Quiz
7	**4**	- Enhance brightness of digital image	Data Show	Quiz
8	**4**	- Digital image enhancement - Spatial Filters (Mean and Weighted Mean Filter)	Data Show	Quiz
9	**4**	- Digital image enhancement - Spatial Filters (Min, Max and Median Filter)	Data Show	Quiz
10	**4**	- Edge Detection - Prewitt, Sobel and Laplace Filter	Data Show	Quiz
11	**4**	- Discrete Fourier Transform (DFT) and Low Pass Filter - Convert image to frequency domain	Data Show	Quiz
12	**4**	- Image compression - Discrete Wavelets Transform (DWT)	Data Show	Quiz

11. Course Evaluation	
60% (50% on the written final exam, 10% on the final lab exam), 40% on the course (5% on the attendance, 15% on the monthly exam, 5% on the quizzes, 15% on the lab.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if an	Rafael C. Gonzalez, Richard E. Wood. Digital image processing 4th edition 2018. Pearson Education. Inc. Pearson, Prentice Hall.
Main references (sources)	Digital Image Processing and Analysis, 2nd edition Scott E Umbaugh, 2010.
Recommended books and references (scientific journals, reports...)	Wilhelm Burger, Principles of Digital Image Processing: Fundamental Techniques, 2009th Edition.
Electronic References, Websites	https://sisu.ut.ee/imageprocessing/book/1

NEURAL NETWORKS COURSE DESCRIPTION

1. Course Name:	
Neural Networks	
2. Course Code:	
CSC3646	
3. Semester / Year:	
Third Grade/ 2nd semester / 2024-2025	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
In person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30/2	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Amer A.Abdulrahman Email: amer.abdulrahman@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	• Understand and understand the subject of intelligent neural networks. • Dealing with intelligent neural network algorithms. • Understanding mathematical methods and techniques in solving neural netw applications
9. Teaching and Learning Strategies	
Strategy	Explaining the scientific material to students in detail. Students' participation in solving mathematical problems Discussion and dialogue about vocabulary related to the topic

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction of ANN	Introduction of ANN	Theoretical lectures	Weekly, montl daily exams and end-of-semester exa
2	2	Neuron Models	Neuron Models	=	=
3	2	Network Architectures	Network Architectures	=	=
4	2	Types of Problems	Types of Problems	=	=
5	2	Exam1	Exam1	=	=
6	2	Neural Network Learning	Neural Network Learning	=	=
7	2	Hebbian Learning Rules	Hebbian Learning Rules	=	=
8	2	Delta Learning Rules	Delta Learning Rules	=	=
9	2	Backpropagation algorithm(1)	Backpropagation algorithm(1)	=	=

10	2	Backpropagation algorithm(1)	Backpropagation algorithm(1)	=	=
11	2	Exam2	Exam2	=	=
12	2	Hopfield Network(1)	Hopfield Network(1)	=	=
13	2	Hopfield Network(2)	Hopfield Network(2)	=	=
14	2	Discussions	discussions	=	=
15	2	Final Exam	Final Exam	=	=

11. Course Evaluation	
Weekly, monthly, daily exams and the end-of-semester exam.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	"Neural Networks and Deep Learning: A Textbo by Charu C. Aggarwal
Main references (sources)	1- Artificial Neural Networks (, Paul E. Keller) 2- Introduction to Artificial Neural Networks Gunjan Goswami
Recommended books and references (scientific journals, reports...)	1- Artificial Neural Networks (, Paul E. Keller) 2- Introduction to Artificial Neural Networks Gunjan Goswami
Electronic References, Websites	http://neuralnetworksanddeeplearning.com/

RESEARCH METHODOLOGY COURSE DESCRIPTION

1. Course Name:	
Research Methodology	
2. Course Code:	
CSC3647	
3. Semester / Year:	
Third Grade/ 2nd semester / 2024-2025	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
Attendance sheet in person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
15 Hours / One Unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Assit. Prof. Dr. Zeina Mueen Mohammed Email: zeina.m@uobaghdad.edu.iq	
8. Course Objectives	
Course Objecti	1. Teach students the correct methodology for conducting scientific research. 2. Developing students' scientific writing skills, as they learn how to write structured academic scientific reports. 3. Identify the types of scientific research and distinguish between them. 4. Providing students with the skill of scientific searching on the Internet. 5. Encouraging research programs and participating in scientific conferences and seminars.
9. Teaching and Learning Strategies	
Strategy	1. Lectures (hard copy). 2. Presentations. 3. Field visits. 4. Electronic classes and websites. 5. Assigning the student some individual and group assignments. 6. Managing the lecture in a way that indicates the importance of time.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Introduction to Research Methodology –Part 1 (a) A review of the Fundamentals (b) Definitions of Research (c) Objectives of Research	Introduction to Research Methodology	Discussions Seminars Lectures Assignments and preparing reports	Daily exams Midterm exams Final Exams
2	1	Introduction to Research Methodology –Part 2	Introduction to Research		

		(d) Motivation in Research (e) General Characteristics of Research (f) Types of Research	Methodology		
3	1	The Research Problem –Part 1 (a) What is a Research Problem (b) Selecting the Problem (c) Sources of the Problem	The Research Problem		
4	1	The Research Problem –Part 2 (d) Statement of a Problem (e) Evaluation of a Problem	The Research Problem		
5	1	The Review of Literature (a) Meaning of Review of Literature (b) Objectives of Review of Literature (c) Sources of Literature (d) Reporting the Review of Literature	The Review of Literature		
6	1	Exam			
7	1	The Research Approach –Part1 (a) The Qualitative Approach (b) The Quantitative Approach	The Research Approach		
8	1	The Research Approach –Part2 (c) The Mixed-Methods Approach (d) Criteria for Selecting a Research Approach	The Research Approach		
9	1	Data Collection Methods – Part1 (a) Questionnaires (b) Interviews	Data Collection Methods		
10	1	Data Collection Methods – Part2 (c) Focus Groups (d) Observation	Data Collection Methods		
11	1	Sampling (a) Meaning and Definition of Sampling (b) Functions of Population and Sampling (c) Methods of Sampling	Sampling		
12	1	Preparation of the Research – part 1	Preparation of the		

		(a) Characteristics of a Good Research Title (b) Structure of research paper: (1) Abstract	Research		
13	1	Preparation of the Research – part 2 Structure of research paper: (2) Introductions (3) Review of the literature (4) Methodology	Preparation of the Research		
14	1	Preparation of the Research – part 3 Structure of research paper: (5) Result & Discussions (6) Conclusions	Preparation of the Research		
15	1	Exam			

11. Course Evaluation	
70%: Daily exams, Midterm Exams. 30%: Discussions, Seminars, Assignments and preparing reports.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1. Mishra, S. B., & Alok, S. (2022). Handbook of research methodology. 2. Kumar, R. (2018). Research methodology: A step-by-step guide for beginners. Sage. 3. Kothari, C. R. (2004). Research methodology: Methods and techniques. New Age International.
Recommended books and references (scientific journals, reports...)	Books and research papers from Scopus and WoS databases
Electronic References, Websites	

Fourth Grade – First Semester

PARALLEL PROGRAMING COURSE DESCRIPTION

1. Course Name:	
Parallel Programming	
2. Course Code:	
CSC4748	
3. Semester / Year:	
2024-2025 First semester	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 Hours / 2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Ammar I.Shihab Email: ammar.i@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	The objective of a **Parallel Programming** course is to equip students with the theoretical foundations and practical skills needed to design, implement, and optimize programs that run efficiently on parallel computing architectures. Here's a structured breakdown of typical course objectives: 1. **Understand Parallel Architectures** Learn about shared and distributed memory systems, multi-core rocessors, GPUs, and interconnection networks. 2. **Master Parallel Programming Models** Gain proficiency in models such as **OpenMP**, **MPI**, and understand their use cases. 3. **Develop Parallel Algorithms** Design and analyze algorithms that leverage concurrency, including divide-and-conquer, pipelining, and task/data parallelism. 4. **Analyze Performance and Scalability** Learn to model and evaluate the performance of parallel programs, including speedup, efficiency, and load balancing. 5. **Address Synchronization and Communication** Understand issues like race conditions, deadlocks, and synchronization mechanisms in shared and distributed memory environments. 6. **Apply to Real-World Problems** Implement parallel solutions for computationally intensive tasks in scientific computing, machine learning, and data processing.
9. Teaching and Learning Strategies	
Strategy	1. Problem Decomposition Break down a large problem into smaller, independent tasks. This is the foundation of parallelism—identifying what can be done concurrently. 2. Task Assignment and Mapping Assign tasks to processing units (threads, cores, or nodes) in a way that

	balances workload and minimizes idle time. 3. Orchestration and Synchronization Coordinate the execution of tasks, ensuring correct sequencing and managing dependencies using synchronization primitives like locks, barriers, and semaphores. 4. Communication Strategy In distributed systems, define how tasks exchange data—using message passing (e.g., MPI) or shared memory (e.g., OpenMP). Efficient communication is key to performance. 5. Performance Optimization Apply strategies like minimizing synchronization overhead, reducing communication latency, and maximizing data locality to improve speedup and scalability. **6.** Scalability and Load Balancing Ensure the program scales with increasing processors and that work is evenly distributed to avoid bottlenecks.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4 hours/ In weeks	Introduction to multi core architecture and distributed systems.	Introduction to OpenMP concepts.	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
2	4 hours/ In weeks	Introduction to parallel hardware: Multi-cores and multiprocessors; shared memory and message passing architectures	Creating threads	Theoretical and practical lectures	=
3	4 hours/ In weeks	Fundamentals of Shared Memory Programming	Parallel directive	Theoretical and practical lectures	=
4	4 hours/ In weeks	Parallel architecture and Parallel algorithm design	Data environment1	Theoretical and practical lectures	=
5	4 hours/ In weeks	Fundamental concepts of parallel programming.	Data environment2	Theoretical and practical lectures	=
6	4 hours/ In weeks	Introduction to Basic OpenMP concepts. & PARALLEL directive	Run library routines 1 & Run library routines 2	Theoretical and practical lectures	=

7	4 hours/ In weeks	Mid Term Exam	Mid Term Exam	Theoretical and practical lectures	=
8	4 hours/ In weeks	Creating Threads	Timing	Theoretical and practical lectures	=
9	4 hours/ In weeks	Synchronization	Synchronization flush, atomic, barrier	Theoretical and practical lectures	=
10	4 hours/ In weeks	Parallel Loops	Synchronization ordered, Low level synchronization	Theoretical and practical lectures	=
11	4 hours/ In weeks	Scheduling and Synchronization single, masters and stuff	Synchronization locks (both simple and nested) and False sharing	Theoretical and practical lectures	=
12	4 hours/ In weeks	Data environment	critical, atomic	Theoretical and practical lectures	=
13	4 hours/ In weeks	Schedule for sections & Tasks	Parallel loops, For & Reduction, No wait	Theoretical and practical lectures	=
14	4 hours/ In weeks	Runtime Library Routines	Memory model.		=
15	4 hours/ In weeks	Final Exam	Final Exam		=

11. Course Evaluation

- Conducting daily, monthly exams and daily evaluation in addition to the practical part in the laboratory. The pursuit grade is 40% and the final exam grade is 60%.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Parallel Programming with Microsoft® Visual Studio 2010 Step by Step. Donis Marshall. Microsoft Corporation (2011). 2- Multi-Core programming, Increasing performance through software multithreading, Shameem Akther and Jason Roberts. Intel corporation (2006). 3- Using OpenMP Portable Shared Memory Parallel Programming Barbar Chapman, Gabriele Jost.

Main references (sources)	1- OpenMP Application Program Interface, Version 3.1 July 2011. 2- OpenMP Application Program Interface, Examples, Version 4.0.1 - February 2014.
Recommended books and references (scientific journals, reports...)	www.openmp.com
Electronic References, Websites	1. Parallel Programming with Microsoft® Visual Studio 2010 Step by Step. Donis Marshall. Microsoft Corporation (2011). 2. Multi-Core programming, Increasing performance through software multithreading, Shameem Akther and Jason Roberts. Intel corporation (2006). 3. Using OpenMP Portable Shared Memory Parallel Programming Barba Chapman, Gabriele Jost. 4. **Parallel Programming: for Multicore and Cluster Systems – Sprin** A comprehensive textbook by Thomas Rauber and Gudula Rünger that explores parallel architectures, programming models (OpenMP, MPI, CUDA), and performance optimization techniques. It's widely used in academic courses and includes updated content on energy efficiency ar GPU programming. 5. **Introduction to Parallel Computing – Cambridge University Press** This reference includes a rich bibliography and foundational material on parallel algorithms, memory models, and interconnection networks. It's ideal for both theoretical grounding and practical insights. 6. **Lectures on Parallel Computing – arXiv** A freely accessible set of lecture notes that span fundamentals of parallel computing, shared-memory programming, and high-performance computing concepts. Great for academic use and self-study. 7. **Parallel Programming Course Repository – GitHub (Peking University)** A curated collection of course materials, assignments, and reference codes based on Peter Pacheco's textbook. It includes practical examples using OpenMP, MPI, and CUDA.

OPERATING SYSTEMS II COURSE DESCRIPTION

1. Course Name:	
Operating Systems II	
2. Course Code:	
CSC4749	
3. Semester / Year:	
2024-2025 First semester	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 Hours / 2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name:Dr. Nada A.Z. Abdullah Email: nada.abdullah@sc.uobaghdad.edu.iq Name: Dr. Mariam A. Yasir Email : maryam.a@sc.uobghdad.edu.iq	
8. Course Objectives	
Course Objectives	1. Recognize the importance of operating systems. 2. Recognize how the applications interact with the operating system as the later working as intermediary program between the machines and the application. 3. Know how the operating systems transport the application requests to the hardware. 4. Understand how operating systems manage resources such as processors, memory and I/O. 5. Realize the efficiency or the deficiency of the different techniques used by some operating systems.
9. Teaching and Learning Strategies	
Strategy	1. Attend Lectures: Regularly attend lectures to grasp the foundational concepts and understand the material presented by the instructor. 2. Take Detailed Notes: Take thorough and organized notes during lectures to aid in comprehension and review later. 3. Read the Textbook: Read the recommended textbook to gain additional insights, explanations, and examples related to operating systems. 4. Engage in Discussions: Participate in class discussions, group study sessions, or online forums to exchange ideas. 5. Complete Assignments and Projects: Actively engage in practical assignments and projects to apply theoretical concepts and enhance student hands-on skills. 6. Practice with Sample Problems: Solve sample problems and practice

	exercises provided by the instructor or in the textbook to reinforce student understanding. 7. Utilize Online Resources: Make use of online tutorials, educational websites, and video lectures to supplement student learning and explore different perspectives on the topics. 8. Create Concept Maps or Diagrams: Visualize complex concepts by creating concept maps or diagrams to establish connections and enhance understanding. 9. From Study Groups: Collaborate with classmates to discuss challenges, topics, solving problems collectively, and sharing different perspectives.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	understanding Synchronization and Race condition	Synchronization and Race condition	White board+ Data show	Oral exam
2	2	understanding Critical sect solutions	Critical section solutions	White board+ Data show	Oral exam
3	2	understanding atomic instruction	Atomic instruction	White board+ Data show	Oral exam
4	2	understanding Semaphores	Semaphores	White board+ Data show	Oral exam
5	2		Exam		Written
6	2	Main memory	Main memory	White board+ Data show	Oral exam
7	2	Contiguous allocation	Contiguous allocation	White board+ Data show	Oral exam
8	2	Paging	Paging	White board+ Data show	Oral exam
9	2	Segmentation	Segmentation	White board+ Data show	Oral exam
10	2	Paging and segmentation implementation	Paging and segmentation implementation	White board+ Data show	Oral exam
11	2		Exam		Written
12	2		Seminars	White board+ Data show	Oral exam
13	2	Virtual memory	Virtual memory	White board+ Data show	Oral exam
14	2	Page fault	Page fault	White board+ Data show	Oral exam

15	2		Exam		Written

11. Course Evaluation
• Daily exams • Participation degrees in answering questions during the lecture • Monthly exams • Reports • Seminars

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Silberschatz, Galvin, Gagne. Operating System Concepts. John Wiley & sons , inc 2018
Main references (sources)	Operating systems design and implementation, Andrew s. Tanenbaum, Prentice-Hall
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

ADVANCED COMPUTER NETWORKING COURSE DESCRIPTION

1. Course Name:	
Advanced Computer Networking	
2. Course Code:	
CSC4750	
3. Semester / Year:	
1st Sem / 2024-2025	
4. Description Preparation Date:	
1st Oct. 2024-2025	
5. Available Attendance Forms:	
Attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60+113/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Prof. Dr. Suhad Faisal, Lecturer. Dr. Zaid Hashim Email: suhad.f@sc.uobaghdad.edu.iq, Email: zaid.h@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	• Working with networks often involves teamwork and collaboration. Students should enhance their communication skills and learn to collaborate effectively with peers in network design, implementation, and troubleshooting scenarios. • Through hands-on labs, projects, and case studies, students should develop critical thinking and analytical skills necessary to evaluate network architectures, identify optimization opportunities, and make informed decisions.
9. Teaching and Learning Strategies	
Strategy	1. Explaining the scientific material to students in detail 2. Students' participation in solving programming problems. 3. Discussion and dialogue about vocabulary related to the topic. 4. Use the electronic classroom (Google Classroom) to upload lectures in the form of PD files (in short form), where their details are explained in the lecture, with many examples solved on the blackboard, discussion with students, and answers to their inquiries. 5. The electronic classroom is also used to give homework assignments and upl answers within the electronic classroom. The classroom is also used to announce ex dates and grades... etc.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Components	Network Components	Data show	quiz
2	2	Topologies	Network Representations and Topologies	Data show	quiz
3	2	Types of Networks	Common Types of Networks	Data show	quiz
4	2	Connections	Internet Connections	Data show	quiz
5	2		First exam	Data show	quiz

6	2	Reliability	Reliable Networks	Data show	quiz
7	2	Trends	Network Trends	Data show	quiz
8	2	Security	Network Security	Data show	quiz
9	2		Second exam	Data show	quiz
10	2	IT	The IT Professional	Data show	quiz
11	2	Switch	Basic Switch and End Device Configuration	Data show	quiz
12	2	IOS	Cisco IOS Access	Data show	quiz
13	2	Navigation	IOS Navigation	Data show	quiz
14	2	Command Structure	The Command Structure	Data show	quiz
15	2		Mid Exam	Data show	quiz

11. Course Evaluation	
60% (50% on the written final exam, 10% on the final lab exam), 40% on the course (5% on the attendance, 15% on the monthly exam, 5% on the quizzes, 15% on the lab.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	5. Cisco Networking Academy 20 https://www.netacad.com/courses/networking/ccna-introduction-networks. 6. Computer networking a top-down approach edition, Kurose, Ross. 7. Data Communications and Networking by Behr A.Forouzan 5th edition. 8. CISCO websites, References.
Recommended books and references (scientific journals, reports...)	Mastering Computer Networking: Essen Techniques Kindle Edition
Electronic References, Websites	

FUNDAMENTALS OF MULTIMEDIA COURSE DESCRIPTION

1. Course Name:
Fundamentals of Multimedia
2. Course Code:
CSC4751
3. Semester / Year:
First semester / 2024-2025
4. Description Preparation Date:
1/10/2024
5. Available Attendance Forms:
Morning and Evening attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours (2 Theoretical / 2 Practical)
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Sabbih Hamoud Rafal Ali Sameer Email: Mohammed.s@sc.uobaghdad.edu.iq Rafal.a@sc.uobaghdad.edu.iq
8. Course Objectives
1. Enable students to define the scope of the field called Multimedia. 2. Know the processing of multimedia components (including text, sound, image, video) in its space domain and in the frequency domain. 3. Discussing the methods used in this field, as well as knowing the basics of the text, sound, image, video in terms of its composition, the processes of converting it into a digital, and processing. 4. Using computer programming in the laboratory to clarify and achieve the above-mentioned goals using programming languages. 5. Discussing the basics of sound, image, video compression and the algorithms used in this field. 6. Building applied projects that employ Multimedia components for community service purposes.
9. Teaching and Learning Strategies
1. Explaining the scientific material to students in detail, having students participate in solving mathematical problems, and using the blackboard to explain and solve examples. 2. Use Power Point presentation programs in the classroom when giving lectures. 3. Discussion and dialogue about vocabulary related to the topic 4. Using computer programming in the laboratory for practical application using the C# environment. 5. Use the electronic platform Google Classroom to provide students with lectures.

10. Course Structure					
Week	**Hours (Theoretical and Practical)**	**Required Learning Outcomes**	**Unit or subject name**	**Evaluation method**	**Learning method**
1	**4**	Basics of Multimedia	-Definition of Multimedia -Components of MM -Digital representation of MM components - Compression in MM	Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions
2	**4**	Multimedia system and Media classification	-MM system -MM Related Technology -Media classification	Electronic presentation in the hall + whiteboard	Quiz
3	**4**	Multimedia application and interaction	-MM application -Interactivity -Categories of MM	Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions
4	**First Exam**				
5	**4**	Multimedia on the web	-Exploring MM on the web -Multimedia data -Global structure of MM	Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions
6	**4**	Sounds	-Basics of Sound -Characteristics of sound wave -Frequency content of audio signal -Digital audio	Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions
7	**4**	Digital sounds	-Nyquist Theorem -Quantization and transmission of audio	Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions
8	**4**	Digital sounds	-Audio compression -Examples	Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions
9	**Second Exam**				
10	**4**	Images	-Basics of image	Electronic	Conduct

			-Number of colors -Types of images	presentation in the hall + whiteboard	discussion and dialogue questions
11	**4**	Digital Images	-Types of Digital Image File Format -Image digitization	Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions
12	**4**	Video and Digital video	-Basics of Video -Characteristics of video -Color models	Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions
13	**4**	Digital Video	-Video size -Examples	Electronic presentation in the hall + whiteboard	Quiz
14	**4**	Digital Video	-Video Formates	Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions
15	**4**	Project discussion		Electronic presentation in the hall + whiteboard	Conduct discussion and dialogue questions

11. Course Evaluation	
Conducting theoretical exams, class participation and attendance, preparing class tests and assignments, conducting a quarterly laboratory exam, and the evaluation also includes preparing a scientific report.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Fundamentals of Multimedia, 2nd Edition, by Ze-Nian Li, Jiangchuan Liu, Mark S. Drew.
Main references (sources)	Digital Video Processing, 2nd Edition, by A. Mu Tekalp.
Recommended books and references (scientific journals, reports...)	Rafael C. Gonzalez, Richard E. Wood. Digital image processing 4th edition 2018. Pearson Education. Inc. Pearson , Prentice Hall.
Electronic References, Websites	What is Multimedia? - GeeksforGeeks

ELECTRONIC COMMERCE COURSE DESCRIPTION

1. Course Name:	
Electronic Commerce	
2. Course Code:	
CSC4752	
3. Semester / Year:	
1st Semester/ 4th Grade/ Academic Year 2024 -2025	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
Mandatory attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2/2 (30)/ 2	
7. Course administrator's name (mention all, if more than one name)	
Name: Pro. Dr. Ghadah K. Al-Khafaji Email: ghada.toma@sc.uobaghdad.edu.iq Name: Asst. Pro. Dr. Bushra A. Sultan Email: Bushra.sultan@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	1- To gain an understanding of the theories and concepts underlying e-commerce. 2-To understanding basic concepts, theories, and business models underlying e-commerce with the theory and concepts to what e-marketers are doing in "the real world" via purchasing using online payments. 3- To understand the relation between E-C and E-B. 4- To improve familiarity with current challenges and issues in e-commerce, especially the security one.
Teaching and Learning Strategies	
Strategy	1- Explaining the scientific material to students in detail. 2- Students' participation in solving programming problems. 3- Discussion and dialogue about vocabulary related to the topic. 4- Use the electronic classroom (Google Classroom) to upload lectures in the form of PDF files (in short form), where their details are explained in the lecture, with many examples solved on the blackboard, discussion with students, and answers to their inquiries. The electronic classroom is also used to give homework assignments and upload answers within the electronic classroom. The classroom is also used to announce exam dates and grades... etc.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	2	Introduction	Introduction to Commerce and E-Commerce: Introduction, An Overview, History of ecommerce; Differences/similarities between e-	Data show	Oral Exam

			commerce and traditional commerce Advantages/Disadvantages, Features & scope characteristics, Development /infrastructures along process and examples.		
2.	2	e-Com Principles	Continue with e-Com Principles: E-Commerce Steps Flow, E-Commerce in Figures, Buyer/Seller Rules, Why Internet Commerce. Internet Commerce Strategies, Benefits and Types of E-Commerce Sites	Data show	Oral Exam
3.	2	Ecommerce /E-Business	Ecommerce /E-Business Models Distinguish between e-commerce and e business, structure, Macro & environment.	Data show	Oral Exam
4.	2	E-C Classification	E-C Classification Models: Identifying Transaction Partners Model with advantages/disadvantages and features of each type	Data show	**Quiz**
5.	2	Degree of digitization	Degree of digitization, Impact of E-C and Social Impact E-Commerce Process Models, The Criteria that Determine the Level of Advancement in EC/EB	Data show	Oral Exam
6.	2	Online Shopping	Online Shopping/ E-Shop	Data show	Oral Exam
7.	2		First Exam	Data show	
8.	2	Benefits and Limitation of E-C	The Benefits and Limitation of E-C (customer, organization & Social, Online Banking What is online banking, how to register for online banking, ad special facilities offered by some internet banking	Data show	Oral Exam
9.	2	Architecture framework of E-C	Architecture framework of E-C. Issues, challenges and problems (technical/non-technical)	Data show	Oral Exam
10.	2	Components of E-C	Components of E-C with Payment Systems &Online shopping: Electronic payments (credit, debit, wallet), and on line shopping features and restrictions	Data show	Oral Exam
11.	2	Electronic Data Interchange	Electronic Data Interchange: EDI documents, Steps in EDI system, structures, Advantages/Disadvantages EDI Working Concept, Implementation difficulties of EDI, Financial EDI, types	Data show	**Quiz**
12.	2	Online advertising	Online advertising: Introduction to online advertising, Internet advertising compared to traditional advertising, Advantages and disadvantages of online advertising types, Web Commerce & Online Auctions	Data show	Oral Exam

13.	2	M-Commerce	M-Commerce: Overview of M-Commerce, Generations of Mobile Wireless Technology, advantages, features and differences.	Data show	Oral Exam
14.	2	e-commerce Security	Internet e-commerce Security, E-Commerce & Ethics	Data show	Oral Exam
15.	2		Exam	Data show	Exam

11. Course Evaluation	
Daily and monthly exams and quizzes, class participation and attendance, in addition to preparing reports so that the endeavor is 40% and the final exam is 60%.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- E-Commerce Business Model 2020: This Book Includes: Online Marketing Strategies, Dropshipping, Amazon FBA - Step-by-Step Guide with Latest Techniques to Make Money Online and Reach Financial Freedom. (2020). Jim, W. and George, B. Independently published 2The Business of Platforms: Strategy in the Age of Digital Competition, Innovation, and Power. (2019), Michael A. , Annabelle G., and David B. Harper Business; Illustrated edition 3- Electronic Commerce 2018 A Managerial and Social Networks Perspective. (2018) Turban, E., Outland, J., King, D., Lee, J.K., Liang, T.-P., Turban, D.C. Springer International Publishing 4-Introduction to E- Commerce: Combining Business and Information Technology. (2016), Martin, K. Deloitte. 5-E Commerce and EBuisness, Zorayda Ruth B. Andam , (2013) merce Strategy, Technologies and Applications, David Whiteley. (2010).
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://www.slideshare.net/Saddamuddin/ecommerce-short-notes http://wikipedia.org/wiki/online_advertising https://backup.pondiuni.edu.in/storage/dde/dde_ug_pg_books/E-%20Commerce.pdf استخدام لبعض مواقع التجاره الالكترونيه الموثوقه مثل e bay & Amazon

ADVANCED MOBILE COMPUTING COURSE DESCRIPTION

1. Course Name:	
Advanced Mobile Computing	
2. Course Code:	
CSC4753	
3. Semester / Year:	
First semester / 2024-2025	
4. Description Preparation Date:	
2024-2025	
5. Available Attendance Forms:	
Physical attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours (weekly) + 2 practical hours (weekly)/ three units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Alyaa Mohammed Noori Idan Al-Barrak Email: Alyaa.al-barrak@sc.uobaghdad.edu.iq	
8. Course Objectives	
a. Preparing specialists who are familiar with the basics of mobile phone computing in theory and practice and who can fill the needs of the labor market. b. Cooperating with state institutions and the private sector by providing scientific advice and consultations.	•Conducting scientific research and trying to keep pace with scientific development.
9. Teaching and Learning Strategies	
Strategy	• Theoretical lectures in class, in addition to downloading PDF files into the electronic class for reference when needed. • Practical lectures in the laboratory in addition to electronic classes for practical mobile phone computing • Educational videos via the official YouTube channel • Recorded lectures for Google Mate that are uploaded to the electronic classroom, recorded from past years. • Electronic books and lectures that can be consulted.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First Week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's	GSM	Attending a theory lecture	Daily and monthly exams and homework

		professional aspect and market requirements			
2nd week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	GSM Frame	Attending a theory lecture	Daily and monthly exam and homework
3rd week	2	Be prepared for the frequent exams	1st exam	In-person examination	
4th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	GSM Protocols	Attending a theory lecture	Daily and monthly exam and homework
5th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	GSM - Radio Air Interface Fdd/FD MA	Attending a theory lecture	Daily and monthly exam and homework
6th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	GSM System Calling	Attending a theory lecture	Daily and monthly exam and homework
7th week	2	Be prepared for the frequent exams	Second Exam	In-person examination	
8th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Handover and Security	Attending a theory lecture	Daily and monthly exam and homework
9th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	New Data Services	Attending a theory lecture	Daily and monthly exam and homework
10th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's	Motivation for a specialized MAC	Attending a theory lecture	Daily and monthly exam and homework

		professional aspect and market requirements			
11th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Mobile IP	Attending a theory lecture	Daily and monthly exam and homework
12th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Mobile Transport Layer	Attending a theory lecture	Daily and monthly exam and homework
13th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Database issues	Attending a theory lecture	Daily and monthly exam and homework
14th week	2	Be prepared for the frequent exams	Third Exam	In-person examination	
15th week	2	Understanding the lecture from a theoretical perspective, future and practical developments, and their impact on the student's professional aspect and market requirements	Data Dissemination	Attending a theory lecture	Daily and monthly exams and homework

11. Course Evaluation	
• Quarterly attendance exams (3 exams are conducted and the two highest grades are chosen) • Daily exams out of 10 and the best ones are selected • Take the practical exams more than twice and choose the highest grade among them • An assignment that gives a class time to submit.	
12. Learning and Teaching Resources	
Required textbooks (curricular books any)	Asoke K Talukder (Author), Roopa Yavagal, "Mobile Computing: Technology, Applications, and Service Creation" McGraw Hill; 1st edition (November 16, 2006).
Main references (sources)	Charles Harper, "Mobile Computing." (2022)
Recommended books and references (scientific journals, reports...)	Pattnaik, P.K. and Mall, R., 2015. Fundamentals of Mobile Computing. PHI Learning Pvt. Ltd.
Electronic References, Websites	www.geeksforgeeks.org

Fourth Grade – Second Semester

DATA MINING COURSE DESCRIPTION

1. Course Name:	
Data Mining	
2. Course Code:	
CSC4854	
3. Semester / Year:	
4th year 2nd semester	
4. Description Preparation Date:	
1/oct/2024	
5. Available Attendance Forms:	
In person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60/2	
7. Course administrator's name (mention all, if more than one name)	
Name: Tareef kamil mustafa Email: tareef.mustafa@sc.baghdad.edu.iq	
8. Course Objectives	
Course Objectives	Emphasis on concepts of data mining. It includes principles of data mining, data mining functions, data mining processes, data mining techniques, data warehouse and text mining.
9. Teaching and Learning Strategies	
Strategy	- Providing the student with the basics of the topics - Discussions and problem solving during the lecture - Asking intellectual questions, such as why and how - Giving assignments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theoretical 3 Lab	Unit 1	1-Introduction to the course	lectures	Midterm exam Daily evaluations
2	2 theoretical 3 Lab	Unit 2	2-Data analysis and normalization	lectures	Midterm exam Daily evaluations
3	2 theoretical 3 Lab	Unit3	3-Data Warehouse	lectures	Midterm exam Daily evaluations
4	2 theoretical 3 Lab	Unit 4	4-Data mining concepts 1	lectures	Midterm exam Daily evaluations
5	2 theoretical 3 Lab	Unit 5	5-Data mining concepts 2	lectures	Midterm exam Daily evaluations
6	2 theoretical 3 Lab	Unit 6	6-Association rule	lectures	Midterm exam Daily evaluations
7	2 theoretical 3 Lab	1st written exam	Mid	lectures	Midterm exam Daily evaluations
8	2 theoretical 3 Lab	Unit 7	7-Apriori algorithm	lectures	Midterm exam Daily evaluations

9	2 theoretical 3 Lab	Unit 8	8-Naïve Bayesian 1	lectures	Midterm exam Daily evaluations
10	2 theoretical 3 Lab	Unit 9	9-Naïve Bayesian 2	lectures	Midterm exam Daily evaluations
11	2 theoretical 3 Lab	Unit 10	10-Linear regression	lectures	Midterm exam Daily evaluations
12	2 theoretical 3 Lab	Unit 11	11-Text mining	lectures	Midterm exam Daily evaluations
13	2 theoretical 3 Lab	Unit 12	12-Text mining algorithms	lectures	Midterm exam Daily evaluations
14	2 theoretical 3 Lab	Unit 13	13-Text mining algorithms	lectures	Midterm exam Daily evaluations
15	2 theoretical	Evaluation	Final Exam	lectures	Midterm exam Daily evaluations

11. Course Evaluation
- Monthly exams 20% - daily evaluation 10% - homework 10% - final exam 60%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Data mining textbook
Main references (sources)	-
Recommended books and references (scientific journals, reports...)	Jiawei Han & Micheline Kamber, (2013), edition Data Mining: Concepts Techniques",
Electronic References, Websites	https://pzs.dstu.dp.ua/DataMining/bibl/Data%20Mining%20Techniques%20For%20Marketing%20Sales%20And%20Customer%20Relationship%20Management%202Ed.pdf

COMPUTER SECURITY COURSE DESCRIPTION

1. Course Name:	
Computer security	
2. Course Code:	
CSC4855	
3. Semester / Year:	
Second semester/ 2024-2025	
4. Description Preparation Date:	
1-oct-2024	
5. Available Attendance Forms:	
Attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours –week(30) / 2 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Mays M. Hoobi Email: Mays.m@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	**a.** Identify the basic concepts of computer security **b.** Learn how to take advantage of these concepts to protect computers from external threat sources **c.** A detailed understanding of the nature of the work of protection software
9. Teaching and Learning Strategies	
Strategy	Training students in scientific research through seminars and brainstorming during and after the lecture

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction	Introduction to computer security.	Theoretical lectures	Semester exams +quiz + seminars
2	2	Access Control	Access Control -1	Theoretical lectures	Semester exams +quiz + seminars
3	2	Access Control	Access Control -2	Theoretical lectures	Semester exams +quiz + seminars
4	2	Authentication	Identification and Authentication	Theoretical lectures	Semester exams +quiz + seminars
5	2	Malicious software	Malicious software (Malware)-1	Theoretical lectures	Semester exams +quiz + seminars
6	2	Malicious software	Malicious software (malware)-2	Theoretical lectures	Semester exams +quiz + seminars
7	2		**Mid Term Exam**	Theoretical lectures	Semester exams +quiz + seminars

8	2	Virus types	Virus	Theoretical lectures	Semester exams +quiz + seminars
9	2	Firewalls	Introduction to Firewalls -1	Theoretical lectures	Semester exams +quiz + seminars
10	2	Firewalls	Introduction to Firewalls -2	Theoretical lectures	Semester exams +quiz + seminars
11	2	Intrusion	Intrusion detection system	Theoretical lectures	Semester exams +quiz + seminars
12	2	Intrusion	Intrusion prevention system	Theoretical lectures	Semester exams +quiz + seminars
13	2	protocols	security protocols1	Theoretical lectures	Semester exams +quiz + seminars
14	2	protocols	security protocols1	Theoretical lectures	Semester exams +quiz + seminars
15	2		**Final Exam**	Theoretical lectures	Semester exams +quiz + seminars

11. Course Evaluation	
Conducting daily and monthly exams and daily evaluation, in addition to giving seminars during the lecture. The pursuit grade is 40% and the final exam grade is 60%.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Security in Computing, Fourth Edition, By Charles P. Pfleeger - Pfleeger Consulting Group, Shari Lawrence Pfleeger, 2010
Main references (sources)	Stallings W., 2017,***"Network Security Essentials, Applications and Standards "***, Fourth edition, Pearson Education, Inc.,
Recommended books and references (scientific journals, reports...)	Various scientific research on the Internet
Electronic References, Websites	Various research websites in internet

ROBOTICS CONTROL COURSE DESCRIPTION

1- Course Name:	
Robotics Control	
2- Course Code:	
CSC4856	
3- Semester / Year:	
2nd Semester/ 4th Grade/ Academic Year 2024-2025	
4- Description Preparation Date:	
October -1- 2024	
5- Available Attendance Forms:	
Mandatory	
6- Number of Credit Hours (Total) / Number of Units (Total)	
30/2	
7- Course administrator's name (mention all, if more than one name)	
Name: lecturer Dr. Huda M. Radha Al-Bayati Email: huda.rada@sc.uobaghdad.edu.iq	
8- Course Objectives	
Course Objectives	1- To develop skills in robot design, construction, and prototyping. 2- Understand robot planning and path optimization algorithms for autonomous navigation. 3- To understand the fundamental principles of robotics, including robot components, sensors, actuators, and control systems. 4- To develop problem-solving and critical thinking skills through hands-on robot projects and challenges. 5- To gain an awareness of current trends and advancements in robotics, such as machine learning, swarm robotics, and humanoids.
9- Teaching and Learning Strategies	
Strategy	• Lectures: Traditional lectures can be used to deliver theoretical concepts, principles, and frameworks related to robotics. Lectures can be supplemented with visual aids, demonstrations, and examples to enhance understanding. • Hands-on Lab Work: Practical lab sessions allow students to apply theoretical knowledge by working with robots and programming languages. These hands-on activities provide opportunities for experimentation, troubleshooting, and skill development. • Group Projects: Assigning group projects encourages collaboration, problem-solving, and teamwork. Students can work together to design, build, and program robots to accomplish specific tasks or challenges. This fosters practical application, critical thinking, and project management skills.

10- Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1.	**2**	Understand the importance of robotics, robotics paradigms types	Introduction - What are Robots?, What are Robotic Paradigms?	Data show White Board	Daily quiz
2.	**2**	Learn about Planning in Robotics and node relaxation	Planning in Robotics – Definition of Path Planning and Path planning algorithms, node relaxation	Data show White Board	Daily quiz
3.	**2**	Understand the Dijkstra.s algorithm	Dijkstra‘s algorithm, Dijkstra‘s algorithm and the multiple start points	Data show White Board	Daily quiz
4.	**2**	Learn how the heuristic algorithm A* work	The A* algorithm in path planning	Data show White Board	Daily quiz
5.	**2**	Understand the Types of Variants A* algorithm	Variants of A* algorithm (Beam search, Iterative Deepening A*, Dynamic weighted A*)	Data show White Board	Daily quiz
6.	**2**	Learn about the types of heuristic functions	Analysis of heuristic functions (admissible, consistent,and dominance)	Data show White Board	Daily quiz
7.	**2**	Learn how the heuristic search - D* Lite algorithm work	Incremental heuristic search - D* Lite algorithm	Data show White Board	Daily quiz
8.	**2**		Mid-term Exam		
9.	**2**	Understand the Types of advancements in robotics	Advancements in Robotics: Emerging Trends Defining the Future. (e.g., soft robotics, bio-inspired robotics), Implications of robotics in healthcare, transportation, and other industries.	Data show White Board	Daily quiz
10.	**2**	Understand how the blocks word works	Planning: Problem decomposition, An example domain: The blocks world	Data show White Board	Daily quiz

11.	**2**	Understand the Types of Planning methods (Planning with state-space search, Goal stack planning)	The component of planning system and applying the rules, Planning methods (Planning with state-space search, Goal stack planning)	Data show White Board	Daily quiz
12.	**2**	Learn about Q learning algorithm work	Robot Learning and Adaptation – Reinforcement learning(Q learning) for robot behavior	Data show White Board	Daily quiz
13.	**2**	Learn about the types of sensors and arduino	Robot Design and Construction - How does a robot sense its environment? Types of sensors,	practical experience	Practical quiz
14.		Learn practical experience using Arduino, motors and sensors	Build a simple circuit for object detection sensor using Arduino	practical experience	Practical quiz
15.	**2**	Learn practical experience using Arduino, servo and sensors	Robot Design and Construction - How does a robot act in its environment? Types of motors, Build a simple circuit for servo motor control using Arduino	practical experience	Practical quiz
16.	**2**		**Preparatory week before the final Exam**		

11- Course Evaluation	
Distributing the score out of ٤1 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)	Russell, Stuart and Norvig, Peter. Artifi Intelligence: A Modern Approach. 3: Pren Hall, 2010.
Recommended books and references (scientific journals, reports...)	Spong, Mark W., Hutchinson, Seth, Vidyasagar, M. Robot Modeling and Cont2nd Edition: Wiley, 2020.
Electronic References, Websites	https://www.edx.org/learn/robotics

DATA COMPRESSION COURSE DESCRIPTION

1. Course Name:	
Data Compression	
2. Course Code:	
CSC4857	
3. Semester / Year:	
2nd Semester/ 4th Grade/ Academic Year 2024 -2025	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
Mandatory attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Pro. Dr. Bushra A. Sultan Email: Bushra.sultan@sc.uobaghdad.edu.iq Name:Dr. Ahmed Hashim Husein Email: ahmed.husein@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	1- Understand how to reduce data by exploiting redundancy(s). 2- Using with different compression methods and techniques. 3- Understanding the compression mechanism for different types of data. 4- The student's knowledge encountered the data compression process. 5- Understanding and be familiar with standard compression techniques. 6- Learn about standard data compression applications for Biometric applications
9. Teaching and Learning Strategies	
Strategy	1- Explaining the scientific material to students in detail. 2- Students' participation in solving programming problems. 3- Discussion and dialogue about vocabulary related to the topic. 4- Use the electronic classroom (Google Classroom) to upload lectures in the for of PDF files (in short form), where their details are explained in the lecture, with many examples solved on the blackboard, discussion with students, and answers their inquiries. The electronic classroom is also used to give homework assignments and upl answers within the electronic classroom. The classroom is also used to annou exam dates and grades... etc.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	**2**	lossless and lossy base	1- Introduction to data compression of lossless and lossy base, the need, how to solved the problem in image audio, video and text, Application of compression	Data show	**Oral Exam**

			and models of data compression.		
2.	**2**	Types of all data	2- Redundancy Types of all data, Human Visual System and Fidelity Criteria.	Data show	**Oral Exam**
3.	**2**	Transform & Spatial coding	3- Image Compression Structure with Transform Coding & Spatial coding Mapper/de-mapper.	Data show	**quiz**
4.	**2**	Vector Quantizer	4- Image Compression Structure with Scalar (uniform/non-uniform) &Vector Quantizer.	Data show	**Oral Exam**
5.	**2**	LZW (LZW77, LZW78)	5- Image Compression Structure with Statistical Lossless coding Techniques of Entropy Based: Huffman Coding and Dictionary Lossless coding Techniques LZW (LZW77, LZW78) along Information Theory	Data show	**Oral Exam**
6.	**2**		6- First Exam	Data show	**written**
7.	**2**	Block truncation coding	7- Modeling and coding (Autoregressive model Standard and non-standard techniques/lossy & Lossless methods for natural images Compression Applications: Block truncation coding, bit plane slicing, and JPEG)	Data show	**Oral Exam**
8.	**2**	Color image compression	8- Color image compression: Introduction to color images, redundancy and color system structure.	Data show	**Oral Exam**
9.	**2**	Video compression	9- Video compression Techniques: Introduction, types and compression structure.	Data show	**Oral Exam**
10.	**2**	Motion Estimation Techniques	10-Motion Estimation Techniques (frame replenishment) GOP structure, spectral prediction	Data show	
11.	**2**		11- Second Exam	Data show	**quiz**
12.	**2**		12- Text Compression	Data show	**Oral Exam**
13.	**2**	Audio Compression	13- Audio Compression	Data show	**Oral Exam**
14.	**2**	JPEG2000 Mobile multimedia	14- Real world applications for medical & bioinformatics Wavelet based Compression & JPEG2000 Mobile multimedia computing	Data show	**Oral Exam**
15.	**2**		**Exam**	Data show	**Written**

11. Course Evaluation	
Daily and monthly exams and Quizzes, class participation and attendance, in addition to preparing practical reports and projects, so that the endeavor is 40% and the final exam is 40%, in addition to the final Lab. exam is 20%.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1- Gerardus, B. 2020. Data Compression A Complete Guide - 2020 Edition. 5STARCooks 2- Gonzalez, R. C. and Woods, R. E. 2017. Digital Image Processing Using MATLAB. 3rd edn. Gatesmark 3- Sayood, K. 2018. Introduction to Data Compression. 3rd5th edn. Elsevier Publication 4- Gonzalez, R. C. and Woods, R. E. 2017. Digital Image Processing 4th edn. Pearson 5-Shih, F. Y. 2010. Image Processing and Pattern Recognition Fundamental and Techniques 6-Chapman, N. and Chapman, J. 2009. Digital Multimedia, 3rd edn 7- David Salomon, “Data Compression – The Complete Reference,” 4th Edi. Springer, 2006
Main references (sources)	
Recommended books and references (scientific journals, reports...)	• Pearlman, William A., and Amir Said," Digital Signal Compression: Principles and Practice", Cambridge University Press, 2011. • Salomon, David, and Giovanni Motta," Handbook of data compression"' Springer Science and Business Media, Fifth Edition, 2010. • Hoffman, Roy, "Data compression in digital systems", Springer Science and Business Media, 2012
Electronic References, Websites	

SOFTWARE DEVELOPMENT TOOLS COURSE DESCRIPTION

1. Course Name:	
Software Development Tools	
2. Course Code:	
CSC4858	
3. Semester / Year:	
2024-2025 Second semester	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
Compulsory/ Attendance sheet	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 Hours / 2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Safaa K. Alwajidi, Ph.D. Email: safaa.alwajidi@sc.uobaghdad.edu.iq Name: Bilal Albayaty Email : bilal.s@sc.uobghdad.edu.iq	
8. Course Objectives	
Course Objectives	• **Foundational Knowledge:** Gain a comprehensive understanding of the different categories of software development tools and their roles within the Software Development Lifecycle (SDLC). • **Tool Proficiency:** Develop practical skills in using various software development tools, including IDEs, version control systems, debuggers, testing frameworks, and project management tools. • **Workflow Integration:** Learn how to integrate different development tools into a cohesive workflow, streamlining development processes and maximizing efficiency. • **Effective Tool Selection:** Develop the ability to select the most appropriate tool for a specific task based on project requirements, programming languages, and team preferences. • **Best Practices:** Master best practices for using software development tools effectively, including configuration management, automation techniques, and collaboration strategies. • **Troubleshooting and Problem-Solving:** Gain the ability to identify and resolve issues that may arise while using development tools, including debugging errors and optimizing tool performance. • **Staying Updated:** Develop strategies for staying current with advancements in the software development tool landscape. This includes learning about new tools, updates to existing tools, and emerging trends in development methodologies.
9. Teaching and Learning Strategies	
Strategy	**Target Audience:** Define your target audience clearly. Are they beginners, experienced developers, or individuals transitioning to a new toolset? Knowing your audience helps tailor

	the course content and delivery methods. **Learning Objectives:** Establish clear and measurable learning objectives based on the target audience and chosen tools. Refer to the course objectives section we discussed earlier for a foundation and customize them further for your specific course. **Content Selection and Structure:** **Content Scope:** Choose the software development tools you'll cover based on your audience and course goals. Consider including a mix of essential and advanced tools for well-rounded learning. **Structure and Flow:** Organize the course content logically, progressing from foundational concepts to more advanced topics. Start with an introduction to various software development tool categories and their functionalities within the SDLC. Gradually delve deeper into each chosen tool, focusing on core functionalities, practical applications, and best practices. **Instructional Methods:** **Variety is Key:** Employ a diverse range of instructional methods to cater to different learning styles and keep students engaged. Include instructor-led lectures for core concepts, interactive workshops for hands-on practice, video tutorials for visual learners, and group discussions to encourage knowledge sharing. **Balance Theory and Practice:** Provide a strong foundation in theoretical knowledge but ensure a significant portion of the course involves practical exercises and hands-on activities. Students learn best by doing so allow them to experiment with the tools and apply their newfound knowledge to real-world scenarios. **Assessment and Evaluation:** Integrate formative and summative assessments throughout the course. Formative assessments like quizzes, short assignments, and code reviews provide feedback opportunities and help students gauge their understanding. Summative assessments like final exams or projects demonstrate mastery of the learning objectives. **Additional Considerations:** **Real-World Case Studies:** Showcase how professional developers leverage the covered tools in real-world projects. This provides context and demonstrates the practical applications of the learned skills. **Industry Trends:** Incorporate discussions on emerging trends in software development methodologies and how these trends influence the use of development tools. **Continuous Learning:** Encourage students to develop strategies for staying updated with the ever-evolving landscape of software development tools. Recommend resources like online tutorials, industry publications, and developer communities. **Course Delivery Options:** **Traditional Classroom:** Offer in-person lectures, workshops, and hands-on labs to create a collaborative learning environment.

	Online Learning: Develop an online course with video lectures, interactive modules, and online assessments for flexible learning. **Blended Learning:** Combine elements of in-person and online learning, offering a hybrid approach that caters to various learning preferences and schedules.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Overview of different UML diagrams and them purposes.	**Introduction to Software Development Tools**	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
2	3	Modeling objects and types of UML Representing class relationships (Inheritance, association, aggregation, composition) using UML notation.	Understanding the Fundamentals of UML	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
3	3	structural view Behavioral view Implementation view Environmental view	Use Case Diagram	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
4	3	Flow of Events Examples of Use Case Part 1 Postcondition and flow of events	Use Case Part 1	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
5	3	Understanding <<include>>, <<extend>> relationships System boundary Diagram	Use Case part 2	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
6	3	-UML activity diagram -Example: processing order -Parallel activities	Activity Diagram Part 1	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams

7	3	First Exam			
8	3	-Example: enrollment university - Swimlane' Guidelines - advantages and disadvantages of activity diagram	Activity Diagram Part 2	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
9	3	-Understanding class diagram -Static relationships -Aggregation and Composition class diagram -attributes and operations - multiplicity diagram	Class Diagram	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
10	3	Exam#1(Chapters 1, 2 & 3)	Exam 1	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
11	3	Relationships of class diagram	Class diagram examples	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
12	3	UML example 2: flight booking using class diagram	Class diagram additional Examples	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
13	4	-Uses state diagram -Basic components - fork and join	State Diagram Part 1	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
14	4	-Self-transition -steps for development state diagram -examples	State Diagram Part 2	Theoretical and practical lectures	Theoretical exams + practical assessment + practical exams
15	4	Final Exam	Final Exam		Written

11. Course Evaluation	
Conducting daily, monthly exams and daily evaluation in addition to the practical part in the laboratory. The pursuit grade is 40% and the final exam grade is 60%.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1."The Unified Modeling Language Reference Manual" by Grady Booch, James Rumbaugh, and Ivar Jacobson 2. "Using UML: Practical Object-Oriented Design with UML" by Robert B. France and David Harel
Main references (sources)	1-Object-Oriented Systems Analysis and Design Using UML 4th edition By Simon Bennett, Ray Farmer, Steve McRobb , 2010 2- Learning UML 2.0, by Russ Miles, Kim Hamilton, 2006 3- The Elements of UML 2.0 Style by Scott W. Ambler, 2005.
Recommended books and references (scientific journals, reports...)	Various research works in internet
Electronic References, Websites	www.uml.org

ADVANCED COMPUTER GRAPHICS COURSE DESCRIPTION

1. Course Name:	
Advanced Computer Graphics	
2. Course Code:	
CSC4859	
3. Semester / Year:	
2nd Semester/ 4th Grade/ Academic Year 2024 -2025	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
Class attendance system	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 Hours/ 15 weeks / 2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name:Dr. Husam Ali Abdulmohsin Email: husam.a@sc.uobaghdad.edu.iq Name: Dr. Mohammed Ahmed Dawood Email: mohammed.dauwed@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	1- The main objective of this course is to introduce students to the fundamental concepts in computer graphics including a range of computer graphics techniques and algorithms covering 3D graphics, computer animation and virtual reality. 2- It focuses on key algorithmic techniques, mathematical and programmatic foundations of computer graphics, including modeling, rendering, and animating 3D scenes. 3- Topics include three-dimensional shape representations, geometrical transformations (e.g. rotations, scales, translations, reflection, shearing), the projection, the rasterization pipeline, ray tracing, illumination and shading models, texturing, blending and light & visual perception.
9. Teaching and Learning Strategies	
Strategy	1. Delivering lectures to introduce and explain essential concepts, principles, and theories related to computer graphics. This helps students build a strong foundation of knowledge. 2. Giving hands-on programming exercises helps them to apply the learned concepts and implement 3D graphics. This helps their understanding and enhances their programming skills. 3. Providing code walkthroughs and examples demonstrating the modeling and rendering 3D scenes. 4. Conducting problem-solving sessions, both in class and through assignments to allows students to use graphics primitives and transformations for objects modeling and rendering. 5. Encouraging group projects and activities among students. This promotes

	teamwork and enhances understanding. 6. Regular evaluations and examinations help gauge students' understanding and progress. These can include quizzes, assignments, and exams that assess theoretical knowledge and practical application of computer graphics. 7. Recommending textbooks, internet resources, and supplementary references might help students study more effectively.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to 3D graphics.	Introduction to the C# programming language environment, the OpenGL API, and the tools it provides for dealing with computer graphics	White board + Data show	Oral exam
2	2	Introducing the rendering process and its main stages.	Working with geometric shapes (point, line, and rectangle) in OpenGL	White board + Data show	Oral exam
3	2	Learn about three-dimensional coordinates systems.	Modeling some graphic shapes in OpenGL	White board + Data show	quiz
4	2	Introduction to the Projection process and its types.	Programming the different types of Projection and studying their effect and the difference between them	White board + Data show	Oral exam
5	2	Dealing with conversions between Coordinate Systems in 3D graphics programs.	Performing conversions between coordinates systems such as Model View and Viewport transform	White board + Data show	Oral exam
6	2	Dealing with basic 3D transformations (translate, scale, and shearing).	Performing basic and combined transformations on some geometric shapes	White board + Data show	quiz

7	2	Understanding basic 3D transformations (reflection, rotation, composition, and inverse transformations).	Modeling a 3D shape (such as a cube)	White board + Data show	Oral exam
8	2	Identify the effects of lighting and its types.	Programming the lighting effect and its types	White board + Data show	Oral exam
9	2	Dealing with the mechanism of shading and its different types.	Modeling some three-dimensional shapes and studying the effect of light and shadow on them	White board + Data show	Oral exam
10	2	Understanding Texture Mapping and its different types.	Performing Texture Mapping and wrapping 2D images inside 3D faces	White board + Data show	Oral exam
11	2	Introduction to Reflection and Blending methods.	Modeling shapes with different transparency and studying the interactions between them	White board + Data show	Oral exam
12	2	Introduction to animation and its various mechanisms.	Modeling integrated 3D scenes	White board+ Data show	Oral exam
13	2	Dealing with some advanced topics in computer graphics (virtual reality and augmented reality).	Adding animation effects between 3D scenes	White board + Data show	Oral exam
14	2	Understanding some advanced topics in computer graphics (games).	Simulating some effects of virtual reality and augmented reality	White board + Data show	Oral exam

15	2	Mid-Exam.	Mid-Exam + display of projects completed by students	White board + Data show	written

11. Course Evaluation	
• Daily exams • Participation degrees in answering questions during the lecture • Monthly exams • Reports • HomeWorks	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1) "Fundamentals of Computer Graphics", S. Marschner, and P. Shirley, CRC Press (A K Peters), 2021. 2) "Computer Graphics: Principles and Practice", J. F. Hughes, A. V. Dam, M. McGuire, D. F. Sklar, J. D. Foley, S. K. Feiner, and K. Akeley, Addison-Wesley (Pearson Education), 2014.
Main references (sources)	1. Steve Marschner and Pete Shirley. Fundamentals of Computer Graphics. A K Peters, 2021. 2. John F. Hughes, Andries van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner, and Kurt Akeley. Computer Graphics: Principles and Practice. 2014.
Recommended books and references (scientific journals, reports...)	1) "Introduction to Computer Graphics". F. Klawonn, Springer-Verlag London, 2nd Edition, 2012. 2) "OpenGL Programming Guide", Addison-Wesley (Pear Education), D. Shreiner, G. Sellers, J. Kessenich, B. Licea-Kane, Edition, 2013.
Electronic References, Websites	1)https://www.coursera.org/learn/interactive-computer-graphics 2) https://www.sciencedirect.com/journal/computers-and-graphics 3)https://www.frontiersin.org/journals/computer-science/sections/computer-graphics-and-visualization

ENGLISH LANGUAGE COURSE DESCRIPTION

1. Course Name:	
English Language	
2. Course Code:	
CSC4860	
3. Semester / Year:	
2nd / 2025	
4. Description Preparation Date:	
1/10/2024	
5. Available Attendance Forms:	
In person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 credit hours / 2 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr Haneen Ahmed Email: haneen.a@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	Reviewing the English language skills the student has learned and adding new vocabulary and skills that serve the student in his field of academic study, and in developing his linguistic capabilities.
9. Teaching and Learning Strategies	
Strategy	- Providing the student with the basics of the topics - Discussions and problem solving during the lecture - Asking intellectual questions, such as why and how - Giving assignments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theoretical	Unit 1	Home and away	lectures	Midterm exam Daily evaluations
2	2 theoretical	Unit 2	The ends of the Earth	lectures	Midterm exam Daily evaluations
3	2 theoretical	Unit3	The kindness of strangers	lectures	Midterm exam Daily evaluations
4	2 theoretical	Unit 4	A pack of lies	lectures	Midterm exam Daily evaluations
5	2 theoretical	Unit 5	A future perfect	lectures	Midterm exam Daily evaluations
6	2 theoretical	Unit 6	Making it big	lectures	Midterm exam Daily evaluations
7		1st written exam		lectures	Midterm exam Daily evaluations
8	2 theoretical	Unit 7	Let there be love	lectures	Midterm exam Daily evaluations

9	2 theoretical	Unit 8	Going to extremes	lectures	Midterm exam Daily evaluations
10	2 theoretical	Unit 9	The good old days	lectures	Midterm exam Daily evaluations
11		2nd written exam		lectures	Midterm exam Daily evaluations
12	2 theoretical	Unit 10	Over my dead body	lectures	Midterm exam Daily evaluations
13	2 theoretical	Unit 11	Just suppose…	lectures	Midterm exam Daily evaluations
14	2 theoretical	Unit 12	About time!	lectures	Midterm exam Daily evaluations
15	2 theoretical	Review		lectures	Midterm exam Daily evaluations

11. Course Evaluation
- Monthly exams 20% - daily evaluation 10% - homework 10% - final exam 60%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	New Headway Plus Upper Intermediate, John and Liz Soars, Oxford University Press, 2014
Main references (sources)	New Headway Plus Upper Intermediate, John and Liz Soars, Oxford University Press, 2014
Recommended books and references (scientific journals, reports...)	None
Electronic References, Websites	Online dictionaries such as: Meriam-Webster: https://www.merriam-webster.com/ Cambridge: https://dictionary.cambridge.org