Course Description Form

1. Course Name:
Computer vision

2. Course Code:
CSAI4218

3. Semester / Year:
Second Semester 2024-2025

4. Description Preparation Date:
5/2/2025

5. Available Attendance Forms:
weekly Attendance

6. Number of Credit Hours (Total) / Number of Units (Total)
60 H/3 Units

7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Matheel Emaduldeen Abdulmunim Email: matheel.e.abdulmunimQuotechnology.edu.iq

8. **Course Objectives**

Course Objectives	
	• Introducing the student to the subject of computer vision and its connection to the vision how to process images.
	• Problems that appear in the images, the techniques used to address them, and the understanding of

	issues related to distinguishing patterns and ways to describe it.

9. Teaching and Learning Strategies

Strategy	**A- Knowledge and Understanding** A1: Enable the student to know and understand the theoretical principles of windows programming and turn them into programming functions for implementation. A2: The student describes how to build all programming interfaces in windows systems using the functions designated for that. A3: Enable the student to know and understand the practical applications of window programming. A4: To Impart the skills needed to develop windows applications, Student will learn how to design windows and various components of windows, keyboard events, graphics and text, file handling. **B- Subject-specific skills** B1: Logical thinking B2: Giving the students tasks to design different models by using advanced programming languages to motivate the students to acquire skills. **C- Thinking Skills** C1: Ability to work in teams C2: Ability to solve problems and think collectively **D- General and Transferable Skills (other skills relevant to employability and personal development)** D1: Using theoretical and practical tools in the design and implementation of interfaces to create interaction between the user and the computer. D2: Using modern tools of communication to interact with the work team to solve a specific problem D3: The ability to manage time while working as a team.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theoretical 2 laboratories	1,4,5,6,7	Machine vision concepts: Image acquisition, representation and processing.	lectures + Video lectures +	Attendance + answer discussion questions

				Application in the laboratory	
2	2 theoretical 2 laboratories	1,4,5,6,7	Image Algebra, Boolean operators.	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
3	2 theoretical 2 laboratories	1,4,5,6,7	Image classification.	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
4	2 theoretical 2 laboratories	1,4,5,6,7	Histogram operations.	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
5	2 theoretical 2 laboratories	1,4,5,6,7	Feature extraction.	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions

6	2 theoretical 2 laboratories	1,4,5,6,7	Machine vision techniques, element IP functions	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
7	2 theoretical 2 laboratories	1,4,5,6,7	Monadic point by point operators, intensity histogram, Dyadic and linear local operators.	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
8	2 theoretical 2 laboratories	1,4,5,6,7	Edge line detection	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
9	2 theoretical 2 laboratories	1,4,5,6,7	Segmentation: Non contextual technique contextual technique.	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions

10	2 theoretical 2 laboratories	1,4,5,6,7	Pixel connectivity, region similarity, region growing, Mathematical morphology.	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
11	2 theoretical 2 laboratories	1,4,5,6,7	Pattern recognition, Pattern recognition system Design	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
12	2 theoretical 2 laboratories	1,4,5,6,7	Optical Pattern recognition	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
13	2 theoretical 2 laboratories	1,4,5,6,7	Pattern classification	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions
14	2 theoretical 2 laboratories	1,4,5,6,7	Design concepts methodology	lectures +	Attendance + answer

				Video lectures + Application in the laboratory	discussion questions
15	2 theoretical 2 laboratories	1,4,5,6,7	Optical Character Recognition, Content Based Image Retrieval	lectures + Video lectures + Application in the laboratory	Attendance + answer discussion questions

11. Course Evaluation

Attendance - oral exams and tests - mid-course exam - end-of-course exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Not required
Main references (sources)	**Computer Vision and Image Process Scotte E Umbaugh, Second Edition, C press, 2010.**
Recommended books and references (scientific journals, reports…)	**Digital Image Processing, Rafael Gonzalez and Richard E. Woods, Th Edition, Pearson, 2008.**
Electronic References, Websites	