COURSE DESCRIPTION

Faculty	Information Technology				
Department	Computer Science			**NQF level**	7
Course Title	Image Processing	**Code**	508472	**Prerequisite**	501241
Credit Hours	3	**Theory**	3	**Practical**	0
Course Leader	Dr. Omar Obeidat	**email**	o.obeidat@jadara.edu.jo		
Lecturers	Eng. Mashhoor Beneaiesh	**emails**	m.beneaiesh@jadara.edu.jo,		
Lecture time	14:30 – 16:00	**Classroom**	Lab c19	**Attendance**	Fulltime
Semester	First	**Production**		**Updated**	2026-2027
Type of Teaching	☑ Face to Face ☐ Blended ☐ Online				

Short Description
This course provides a comprehensive introduction to digital image processing, focusing on both theoretical foundations and practical implementation using MATLAB. Topics include image representation, enhancement, filtering, transformation in the spatial and frequency domains, image restoration, and color image processing. The course emphasizes solving real-world engineering and scientific problems using modern image processing techniques.

Course Objectives
Upon completion of this course, students should be able to: • Understand the fundamental principles of digital image processing. • Analyze and apply mathematical models for image representation and transformation. • Implement image processing algorithms using MATLAB and its Image Processing Toolbox. • Design solutions for real-world problems involving image enhancement, filtering and restoration.

Course Intended Learning Outcomes (CILOs)
A. Knowledge
a1 (K1): Explain fundamental concepts of digital image processing including acquisition, representation, enhancement, and restoration. **a2 (K2):** Describe mathematical foundations such as transforms, filtering, and frequency domain analysis.
B. Skills
b1 (S1): Apply digital image processing techniques using MATLAB to solve practical problems.

b2 (S2): Design and implement image processing algorithms including filtering, and restoration.
C. Competence
c1 (C1): Develop and evaluate complete image processing solutions while demonstrating autonomy and professional responsibility. **c2 (C2):** Communicate technical results effectively through reports and presentations.
Teaching and Learning Methods
Teaching and learning methods include: ☐ Face-to-face lectures ☐ Guided discussions and brainstorming ☐ MATLAB-based demonstrations ☐ Problem-solving sessions ☐ Case studies.
Assessment Methods
☐ Midterm Exam ☐ Assignments ☐ Project Assessment ☐ Oral Presentation ☐ Final Exam

Course Contents					
Week	**Hours**	**CLOs**	**Topics**	**Teaching & Learning Methods**	**Assessment Methods**
1, 2	6	a1	Introduction	Presentation & discussions	Assignments
3, 4	6	a1, a2	Digital Image Fundamentals	Presentation & discussions	Assignments
5, 6	6	a1, a2, b1, b2	Intensity Transformations and Spatial Filtering	Presentation & discussions	Assignments
7, 8	6	a1, a2, b1, b2	Filtering in the Frequency Domain	Presentation & discussions	Assignments
9	1:30	a1, a2, b1, b2	Midterm Exam		
10, 11	6	a2, b1, b2, c1	Image Restoration and Reconstruction	Presentation & discussions	Assignments
12, 13	6	a2, b2, c1	Color Image Processing	Presentation & discussions	Assignments
14	3	a2, b2, c1	Hough Transform	Presentation & discussions	Assignments
15	2	a1, a2, b1, b2, c1	Final exam		
Infrastructure					

Textbook	Digital Image Processing,4th edition (2018) Rafael C. Gonzalez, Richard E. Woods.
References	Digital Image Processing Using MATLAB, 3rd edition (2020) Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins.
Required reading	
Electronic materials	
Other	**Any other book related to Image Processing**

Assessment Method		**Grade**						
			a1	**a2**	**b1**	**b2**	**c1**	**c2**
First (Midterm)		30	10	6	8	6		
Second (if applicable)								
Final Exam		40	10	10	10	10		
Coursework		30						
Coursework assessment methods	Assignments	5					5	
	Case study							
	Discussion and interaction							
	Group work activities	20					10	10
	Lab tests and assignments							
	Presentations	5						5
	Quizzes							
Total		100	20	16	18	16	15	15

Plagiarism
Plagiarism is defined as the presentation of another individual's work, ideas, or intellectual property as one's own without proper acknowledgment. The department maintains a strict academic integrity policy, and any instance of plagiarism will be addressed in accordance with university regulations. Sanctions may also apply to students who facilitate academic misconduct, including knowingly allowing others to copy their work. Students are encouraged to engage in collaborative learning and group discussions; however, all submitted work must be the result of the student's own understanding and effort. Each student is expected to demonstrate individual competence in all assessed components of the course. To ensure fairness and transparency in assessment, students must adhere strictly to the coursework and assessment guidelines provided in this course specification. These measures are designed to uphold academic integrity, support valid and reliable assessment practices, and ensure that learning outcomes are achieved independently.