COURSE DESCRIPTIONS

Faculty	Science and 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	Ms. Nada Aljarrah	**email**			
Lecturers	Ms. Nada Aljarrah	**emails**	n.aljarrah@jadara.edu.jo		
Lecture time	8:30 – 10:00	**Classroom**		**Attendance**	Fulltime
Semester	1	**Production**		**Updated**	2023-2024
Type of Teaching	☐ Face to Face	☐ Blended	☐ Online		

Short Description
This course aims to learn image processing using Matlab and science problems, introduce to image processing, operations, transforms, image types, Filter, Point processing, neighborhood processing, fourier Processing, Image restoration, image segmentation, and image Morphology.
Course Objectives
Upon completion of this course, students should be able to: • Develop a theoretical foundation of fundamental Digital Image Processing concepts. • Provide mathematical foundations for digital manipulation of images; image acquisition; preprocessing; segmentation; Fourier domain processing; and compression. • Gain experience and practical techniques to write programs using MATLAB language to manipulate images digitally; image acquisition; preprocessing; segmentation; Fourier domain processing; and compression. • familiarize himself/herself with image/video compression standards.

Course Intended Learning Outcomes (CILOs)
A. Knowledge - Theoretical Understanding
The student upon completion of this course will be able to a1: Have a clear understanding of the principals the Digital Image Processing terminology used to describe features of images. (K1)
B. Knowledge - Practical Application
The student upon completion of this course will be able to a2: Have a good understanding of the mathematical foundations for digital manipulation of images; image acquisition; preprocessing; segmentation; Fourier domain processing, compression and analysis. (K5)
C. Skills - Generic Problem Solving and Analytical Skills
The student upon completion of this course will be able to b1: Use different digital image processing algorithms, and Design, code and test digital image processing applications using MATLAB language. (S2)

D. Skills - Communication, ICT, and Numeracy
b2: Be able to use the documentation for, and use, MATLAB library and MATLAB Digital Image Processing Toolbox (IPT). (S3)
E. Competence: Autonomy, Responsibility, and Context
c1. Be able to write programs in Matlab language for digital manipulation of images; image acquisition; preprocessing; segmentation; Fourier domain processing; and compression. ()
Teaching and Learning Methods
☐ Face to Face Lectures ☐ Brain Storming ☐ Synchronous remote ☐ Asynchronous remote ☐ Using Video ☐ Discussions ☐ Research Project ☐ Case Study ☐ Field visit ☐ Problem solving
Assessment Methods
☐ Formative Assessment ☐ Quiz ☐ Lab Exam ☐ Homework ☐ Project Assessment ☐ Oral Presentation ☐ Midterm ☐ Final Exam

Course Contents					
Week	**Hours**	**CLOs**	**Topics**	**Teaching & Learning Methods**	**Assessment Methods**
1	3	a1	Introduction	Presentation & discussions	Assignment (lab Project)
2	3	a1,a2	Image Files and File Types	Presentation & discussions	Assignment (lab Project)
3	3	a1,a2	Image Display	Presentation & discussions	Assignment (lab Project)
4	3	a1, a2, b1	Point Processing	Presentation & discussions	Assignment (lab Project)
5	3	a2, b1, c1	Neighborhood Processing	Presentation & discussions	Assignment (lab Project)
6	3				
7	3	a2, b1, c1	Image Geometry	Presentation & discussions	Assignment (lab Project)
8	1:30	a1,a2, b1	Midterm Exam		
9	3	a2, b1, b2, c1	The Fourier Transform	Presentation & discussions	Assignment (lab Project)
10	3	a2, b1,b2, c1	Image Restoration	Presentation & discussions	Assignment (lab Project)

11	3	a2, b2, c1	Image Segmentation	Presentation & discussions	Assignment (lab Project)
12	3	a2, b2, c1	Mathematical Morphology	Presentation & discussions	Assignment (lab Project)
13	3	a2, b2, c1	Image Topology	Presentation & discussions	Assignment (lab Project)
14	2	a1,a2, b1,b2, c1	Final exam		

Infrastructure	
Textbook	A computational introduction to digital image processing, Alasdair McAndrew, CRC Pres, 2016, 2nd Ed.
References	Color Image Processing and Application, Plataniotis and Ventanopoulos. Dogotal Signal and Image Processing using MATLAB.
Required reading	
Electronic materials	**Available on : http://elearning.jadara.edu.jo/CourseContent/index/10774/**
Other	**Any other book related to Image Processing**

Assessment Method		**Grade**	**a1**	**a2**	**b1**	**b2**	**c1**
First (Midterm)		30	10	10	10		
Second (if applicable)							
Final Exam		40	5	10	10	10	5
Coursework		20					
Coursework assessment methods	Assignments	30			5	10	15
	Case study						
	Discussion and interaction						
	Group work activities						
	Lab tests and assignments						
	Presentations						
	Quizzes						
Total		100	15	20	25	15	20

Plagiarism

Plagiarism is claiming that someone else's work is your own. The department has a strict policy regarding plagiarism and, if plagiarism is indeed discovered, this policy will be applied. Note that punishments apply also to anyone assisting another to commit plagiarism (for example by knowingly allowing someone to copy your code).

Plagiarism is different from group work in which a number of individuals share ideas on how to carry out the coursework. You are strongly encouraged to work in small groups, and you will certainly not be penalized for doing so. This means that you may work together on the program. What is important is that you have a full understanding of all aspects of the completed program. In order to allow proper assessment that this is indeed the case, you must adhere strictly to the course work requirements as outlined above and detailed in the coursework problem description. These requirements are in place to encourage individual understanding, facilitate individual assessment, and deter plagiarism.