FUTURE UNIVERSITY IN EGYPT
جامعة المستقبل

Faculty of Computers & Information Technology

Image Processing

Information :

Course Code :	DM432	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours
Department :	Department of Computer Science				

Instructor Information :

Title	Name	Office hours
Professor	NEVEEN IBRAHIM MOHAMED GHALI	
Assistant Lecturer	Salma Radwan Hassan Abdelhamid	

Area Of Study :

Define the fundamental techniques, algorithms and tools used for acquiring, processing and extracting useful information from digital images.
Understand knowledge that enhances skills in image sampling and quantization, image transforms, image enhancement and restoration, image encoding, image analysis and pattern recognition.
Use and adopt fundamental and advanced mathematics, basic sciences and theories to develop and use the tools of digital image processing (DIP) to solve any new problem

Description :

The objective of this course is to introduce the students to the fundamental techniques and algorithms used for acquiring, processing and extracting useful information from digital images. Particular emphasis will be placed on covering methods used for image sampling and quantization, image transforms, image enhancement and restoration, image encoding, image analysis

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Describe the fundamental mathematics and statistics required to solve problems in image processing field
2 -	Identify different tools of digital image processing (DIP) to solve image problems
3 -	Explain the principles and techniques to solve real-world problems in several areas including medical, remote sensing and surveillance
b.Intellectual Skills: :	
1 -	Illustrate a set of alternative solutions for a given problem associated with their results for image processing problems
2 -	Select appropriate methodologies and techniques to filter in frequency domain images problem solution and setting out their limitations, restrictions and errors
3 -	Classify methods, techniques and algorithms for restoration and segmentation techniques
c.Professional and Practical Skills: :	
1 -	Apply effective information to implement image processing systems

2 -	Deploy effective supporting tools to learn AI programming languages and different supporting image processing tool-boxes
3 -	Use human computer interaction principles in the construction and evaluation of user interfaces for wide ranges of image processing applications
d.General and Transferable Skills: :	
1 -	Exploit a range of learning resources.
2 -	Work in a team to develop the requirement documentation
3 -	Apply communication skills in presentations and report writing using various methods and tools

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to image processing	4	2	2
Digital Image Fundamentals	4	2	2
Digital Image Fundamentals	4	2	2
Dimensional Model Design	4	2	2
Image Enhancement (Histogram Processing)	4	2	2
Image Enhancement (Spatial Filtering 1)	4	2	2
Image Enhancement (Spatial Filtering 2)	4	2	2
Image Enhancement in Frequency domain	4	2	2
Mid Term Exam	4	2	2
Image Enhancement in Frequency domain	4	2	2
Image restoration	4	2	2
Image restoration	4	2	2
Project presentation	4	2	2
Final Exam	2		

Teaching And Learning Methodologies :

Interactive Lectures including discussion
Practical Lab Sessions
Self-Study (Project / Reading Materials / Online Material / Presentations)

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final Exam	40.00	14	
Midterm Exam (s)	20.00	9	
Practical Exam	20.00		
Quizzes	10.00	5	
Team Work Projects	20.00		

Course Notes :

Course Notes are available with all the slides used in lectures in electronic form on Learning Management System (Moodle)

Recommended books :

Kenneth R. Castliman, Digital Image Processing, Prentice-Hall, Inc., latest edition.

Web Sites :

IEEE transactions on image processing
IEEE transactions on pattern analysis and machine intelligence