Course Description Form

1. Course Name:
Image Processing
2. Course Code:
WBM-51-05
3. Semester / Year:
Semester
4. Description Preparation Date:
2024−03−19
5. Available Attendance Forms:
presence in the classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
60 Hours / 3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Faris Kaream Helwat Email: faris.kaream@uowa.edu.iq

8. Course Objectives	
Course Objectives	**This course focuses on image processing and computer vision focuses on studying methods that allow a machine to learn and analyze images and video using geometry and statistical learning. The recent growth of digital imaging technologies, hardware advances, and machine learning models has led to many exciting recent developments in the field of image and video analytics. This course covers a range of topics, starting from the basics of image formation and processing to recent deep learning methods addressing**

9. Teaching and Learning Strategies	
Strategy	1- recognize the image and understanding of the content and the relationship between the location and color value and sorts images according to these color values from black and white images and ending with natural colors. 2-identify the source of the image and representation and formats stage before finishing out as a file in storage unit 3- understand the relationship between image points and how to configure entity within the image and demonstrate chromatography interdependence and on-site 4-discussed ways to enlarge and reduce the image and application of a set of algorithms necessary

	5- touched on the various filters that manipulate the values of the point and leave the various changes to the image 6- addressed to the frequency domain and the spatial domain and how apply filters 7- operations of the histogram, edge, segmentation, restoration, erosion and dolation, and others.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Introduction		Lectures present in PDF format	Daily exams + homework assignments + monthly exams
2	4	Human visual system. Sources of Digital Images, Simultaneous contrast. Optical illusions. Image acquisition.		Lectures presented in PDF format	Daily exams homework assignments monthly exam
3	4	Image formation model. Image sampling and quantization.		Lectures presented in PDF format	Daily exams homework assignments monthly exam
4	4	Representing digital images. Spatial and intensity resolution.		Lectures presented in PDF format	Daily exams homework assignments monthly exam
5	4	Image file format. Basic relationships between pixels. Distance measures.		Lectures presented in PDF format	Daily exams homework assignments monthly
6	4	Distance measures. Point operations. Arithmetic operations Set		Lectures presented in PDF format	Daily exams homework assignments monthly

		and logical operations.			
7	4	First mid teams		Lectures presented in PDF format	Daily exams homework assignments monthly
8	4	Set and logical operations. Spatial domain. Processes on spatial domain.		Lectures presented in PDF format	Daily exams homework assignments monthly
9	4	Basic intensity transformation functions.		Lectures presented in PDF format	Daily exams homework assignments monthly
10	4	Piecewise-linear transformation functions. Histograms. Histogram processing. Histogram equalization.		Lectures presented in PDF format	Daily exams homework assignments monthly
11	4	What is a spatial filter? The mechanics of linear spatial filtering. Correlation and convolution. Smoothing spatial filters (linear and nonlinear). Sharpening spatial filters characteristics Foundation of sharpening filters. Laplacian filter		Lectures presented in PDF format	Daily exams homework assignments monthly

12	4	**Second mid teams**		Lectures presented in PDF format	Daily exams homework assignments monthly
13	4	**Image Segmentation, Application of image segmentation, Point Detection, Line Detection, Edge detection, Sobel Edge detection, Prewitt Edge detection**		Lectures presented in PDF format	Daily exams homework assignments monthly
14	4	**Image Compression, Image Compression System, Compression type, Huffman Coding, Lossy compression**		Lectures presented in PDF format	Daily exams homework assignments monthly
15	4	**Color Image Processing, Color Models, Converting colors between model**		Lectures presented in PDF format	Daily exams homework assignments monthly

11. Course Evaluation

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students
- Establishing grades for environmental duties and the reports assigned to them
- Semester exams for the curriculum, in addition to the mid-year exam and final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Digital Image Processing -Gonzales R Woods R.E. 4th ed., 2018.
Main references (sources)	- Digital Image Processing using SCILAB, Ro M. Thanki • Ashish M. Kothari, 2019. - Digital Image Processing Using MATLA Gonzalez R.C., Woods R.E., and Eddins S., 3 ed., 2020.
Recommended books and references (scientific journals, reports…)	All reputable scientific journals that a related to the broad concept of mathemati theories and their results