



UNIVERSITI TEKNOLOGI MARA

CSC566: IMAGE PROCESSING

Course Name (English)	IMAGE PROCESSING APPROVED
Course Code	CSC566
MQF Credit	3
Course Description	This course is intended to acquaint students with the fundamental understanding of image processing, its most common image processing techniques and its mathematical foundations. It is structured to enable students to understand the underlying principles of digital image formation and related technical aspects, image enhancement, segmentation, and their applications in various industrial areas. Upon completion of the course, the student should be competent in applying the concepts in an image processing project, and should be capable of pursuing research in image processing areas.
Transferable Skills	Demonstrate ability to identify and articulate self skills, knowledge and understanding confidently and in a variety of contexts Demonstrate ability to manage personal performance to meet expectations and demonstrate drive, determination, and accountability. Demonstrate ability to communicate clearly and confidently, and listen critically Demonstrate the ability to dream, imagine and visualize Demonstrate analytical skills using technology. Demonstrate resilience, perseverance and positivity in multi-tasking, dealing with change and meeting new challenges.
Teaching Methodologies	Lectures, Lab Work
CLO	CLO1 Construct image processing algorithm using image processing tools. CLO2 Evaluate scientific skill in image processing techniques. CLO3 Formulates autonomous learning in image processing techniques
Pre-Requisite Courses	No course recommendations
Topics	
1. Fundamentals of Image Processing 1.1) Fundamental issues of image processing 1.2) Applications for image processing 1.3) Components of image processing system 1.4) Using MATLAB	
2. Image Models, Representations And Properties 2.1) Human visual perception 2.2) Electromagnetic spectrum 2.3) Image properties	
3. Sampling and Quantization 3.1) Image acquisition 3.2) Spatial and Fourier domain 3.3) Image sampling and quantization	
4. Enhancement 4.1) Graylevel transformation 4.2) Histogram Processing 4.3) Logical and arithmetic operations 4.4) Image filtering: average, median, min, max 4.5) Image sharpening	

5. Morphological Operations

- 5.1) Dilation and erosions
- 5.2) Opening and closing
- 5.3) Thinning and thickening

6. Image Segmentation

- 6.1) Line, edge and boundary detection
- 6.2) Thresholding
- 6.3) Region-oriented segmentation

7. Color Image Processing

- 7.1) Color models
- 7.2) Color smoothing and sharpening
- 7.3) Color segmentation

8. Representation and Description

- 8.1) Shape descriptors
- 8.2) Color Descriptor

Assessment Breakdown	%
Continuous Assessment	100.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Geometric transformations	10%	CLO2
	Assignment	Assignment 2: Enhancement	10%	CLO2
	Assignment	Assignment 3 : Image Segmentation	10%	CLO1
	Assignment	Assignment 4 : Color	10%	CLO3
	Group Project	Image feature extraction and classification	40%	CLO2
	Test	Test 1	10%	CLO2
	Test	Test 2	10%	CLO2

Reading List	Recommended Text	Reference Book Resources
	<ul style="list-style-type: none"> • Richard E. Woods Rafael C. Gonzalez 2014, <i>Digital Image Processing 3rd Edition (Paperback)</i>, 3rd Ed., 1-10, Pearson United state [ISBN: 978098208540] • Rafael C. Gonzales, Richard E. Woods 2016, <i>Digital Image Processing</i>, 3rd Ed., Pearson 	
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	