

1.	Name of Course/Module	Digital Image Processing	
2.	Course Code	ECP3136	
3.	Status of Subject	Major for B. Sc. (Hons) Medical information technology	
4.	MQF Level/Stage	Bachelor Degree – MQF Level 6	
5.	Version (state the date of the last Senate approval)	[Leave blank]	
6.	Requirement for Registration	TCP1241 Computer Programming II	
7.	Name(s) of academic/teaching staff	Tee Connie	
8.	Semester and Year offered	[Leave blank]	
9.	Objective of the course/module in the programme :		
	To introduce the fundamental concepts of importance in digital image processing, and to provide a comprehensive course on its applications.		
10.	Learning Outcomes :		
	At the completion of the subject, students should be able to:		
	LO1: Understand fundamental digital image processing algorithms (Cognitive, Level 2)		
	LO2: Convert basic theory and algorithms to programs (Cognitive, Level 2)		
	LO3: Describe current issues and technologies in image processing field (Cognitive, Level 6)		
	LO4: Develop applications to process medical images (Cognitive, Level 5)		
11.	Synopsis:		
	The major areas of study include: Digital image characterization, Two dimensional image transforms, Image enhancement, Binary vision algorithms, Image segmentation, Medical imaging.		
	Bidang pembelajaran utama termasuk: Pemrosesan imej digital, Transformasi imej dua dimensi, Peningkatan imej, Algoritma visi perdua, Segmentasi imej, Pengimejan perubatan		
12.	Mapping of Subject to Programme Outcomes :		
	Programme Outcomes		% of Contribution
	PO1:		25
	PO7:		50
	PO8:		25
13.	Assessment Methods and Types :		
	Method and Type	Description/Details	Percentage
	Test	• Written exam	10%

	Tutorial /Assignment	<ul style="list-style-type: none"> Group assignment Focus group discussion at tutorial To enhance understanding of basic concepts in lecture 	10%	
	Project/Lab	<ul style="list-style-type: none"> Group project Focus on group discussion To apply of basic concepts in lecture 	20%	
	Final Exam	<ul style="list-style-type: none"> Written exam 	60%	
14.	Details of Subject			
	Topics	Mode of Delivery		
		Lecture	Lab	Tutorial
	1. Digital image characterization Image sampling and quantization. Mathematical characterization of images.	6	2	2
	2. Two dimensional image transforms Image superposition and convolution, Unitary transforms, Cosine/Sine transforms, Fourier transforms.	8	2	2
	3. Image enhancement Contrast manipulation, Histogram modification, Color enhancement, Image restoration techniques, Geometrical image modification	8	2	2
	4. Binary vision algorithms Introduction to computer vision, Recursive component labeling, Boundary following algorithm, Thinning algorithms, Binary feature extraction, Shape analysis, Fourier descriptors	8	2	2
	5. Image segmentation Clustering, Region segmentation methods, Boundary detection, Texture segmentation, Segment labeling	6	2	2
	6. Medical imaging A survey of various medical imaging modalities, including filmscreen radiography, positron and x-ray computed tomography, and magnetic resonance imaging	6	2	2
	Total	42	12	12
15.	Laboratory			
	<ul style="list-style-type: none"> Image sampling and quantization Image convolution and transformation Image enhancement Binary image processing Image segmentation Medical image case study 			
	Tutorial			

	<ul style="list-style-type: none"> • Image sampling and quantization • Image transformation • Image enhancement • Binary image processing • Image segmentation • Survey of medical images 		
16.	Total Student Learning Time (SLT)	Face to Face (Hour)	Total Guided and Independent Learning
	Lecture	42	42
	Tutorials	12	12
	Laboratory/Practical	12	6
	Presentation		
	Assignment	-	10
	Mid Term Test	1	5
	Final Exam	2	20
	Quizzes (2)	-	2
	Sub Total	69	97
	Total SLT	$166/40 = 4.15 \Rightarrow 4$	
17.	Credit Value	4	
18.	Reading Materials :		
	Textbook	Reference Materials	
	1. Gonzalez, R. C. & Woods, R. E. (2010) Digital Image Processing (3 rd Edition), Prentice Hall, ISBN : 978-0131687288.	1. Bankman, I. (2008) Handbook of Medical Imaging: Processing and Analysis, Academic Press. 2. Parker, J. R. (2010) Algorithms for Image Processing and Computer Vision, Wiley, ISBN: 978-0470643853.	
19.	Appendix (to be compiled when submitting the complete syllabus for the programme) :		
	<ol style="list-style-type: none"> 1. Mission and Vision of the University and Faculty 2. Mapping of Programme Objectives to Vision and Mission of Faculty and University 3. Mapping of Programme Outcome to Programme Objectives 4. Programme Objective and Outcomes (Measurement and Descriptions) 		