

SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	Pattern Recognition								
2.	Course Code	TPR2251								
3.	Status of Course [Applies to (cohort)]	Specialisation Core for B.IT (Hons) Artificial Intelligence								
4.	MQF Level/Stage Note : Certificate – MQF Level 3 Diploma – MQF Level 4 Bachelor – MQF Level 6 Masters – MQF Level 7 Doctoral – MQF Level 8	Bachelor – MQF Level 6								
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Date of previous version : June 2012 Date of current version : June 2014								
6.	Pre-Requisite	TCP1121 Computer Programming								
7.	Name(s) of academic/teaching staff	Pang Ying Han Tee Connie								
8.	Semester and Year offered	Trimester 2, Year 2								
9.	Objective of the course in the programme : To provide a good understanding of pattern recognition systems, algorithms and their applications.									
10.	Justification for including the course in the programme : This subject provides fundamental knowledge and skills in statistical pattern recognition and machine learning.									
11.	Course Learning Outcomes :		Domain			Level				
	LO1 Recognize a wide spectrum of techniques in pattern recognition		Cognitive			1				
	LO2 Explain the pattern recognition procedures and algorithms		Cognitive			2				
	LO3 Plan and design practical pattern recognition solutions		Cognitive			5				
	LO4 Develop a pattern recognition system for real-world applications		Cognitive			5				
12.	Mapping of Learning Outcomes to Programme Outcomes :									
	Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
	LO1							x		
	LO2							x	x	
	LO3	x						x	x	
	LO4	x						x	x	
13.	Assessment Methods and Types :									
	Method and Type		Description/Details				Percentage			
	Mid Term Test		Written Test				20%			

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	Assignment	Report and presentation			20%
	Quiz	Written Test			10%
	Final Exam	Written Test			50%
14.	Mapping of assessment components to learning outcomes (LOs)				
	Assessment Components	LO1	LO2	LO3	LO4
	Mid Term Test	25	20	20	
	Assignment		20	20	100
	Quiz	12.5	10	10	
	Final Exam	62.5	50	50	
15.	Details of Course				
	Topics			Mode of Delivery	
				Lecture	Laboratory
	Introduction Machine Perception, Pattern Analysis and Recognition, Sensing, Segmentation, Feature Extraction, Classification.			4	4
	Review of Probability and Statistics Probability law, Sample Space, Conditional Probability, Bayes Theorem, Cumulative Distribution Function, Probability Density Function, Random Vectors, Covariance Matrix.			2	2
	Bayesian Decision Theory Overview of Bayesian Decision Theory, Loss function, Conditional Risk, Normal Density, Discriminant Function.			4	4
	Maximum-Likelihood & Bayesian Parameter Estimation Parameter Estimation Techniques, Maximum-Likelihood, Bayesian Estimation.			2	2
	Principal Component Analysis and Fisher's Linear Discriminant Dimensionality Reduction, Principal Component Analysis, Fisher's Linear Discriminant.			2	2
	Non-Parametric Techniques Generative Method, Discriminative Method, Parzen Window, K-Nearest Neighbor Estimation.			2	2
	Unsupervised Learning Techniques Basic Concepts, Clustering Algorithms, K-means clustering, Hierarchical Algorithms, Dendrogram.			4	4

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	Neural Networks Basic Concepts, Applications, Activation functions, Training Methods, Perceptrons, Feedforward NN, Backpropagation, Learning Rule.		4	4
	Total		24	24
16.	Total Student Learning Time (SLT)	Face to Face / Guided Learning	Independent Learning	
	Lecture	24	24	
	Tutorials	-	-	
	Laboratory/Practical	24	12	
	Quiz	-	4	
	Assignment	-	10	
	Mid Term Test	1	3	
	Final Exam	2	18	
	Sub Total	51	71	
	Total SLT		122	
	Credit Value		3	
17.	Reading Materials :			
	Textbooks			
	1. G. Dougherty (2013). Pattern Recognition and Classification: An Introduction. Springer.			
	Reference Material (including 'Statutes' for Law)			
	1. M.N. Murty , V.S. Devi (2012). Pattern Recognition: An Algorithmic Approach. Springer.			
	2. S. Marsland (2014). Machine Learning: An Algorithmic Perspective. Chapman and Hall.			
	3. M.K. Pakhira (2011). Digital Image Processing and Pattern Recognition. PHI.			
	4. L. Deligiannidis, H. Arabnia (2014). Emerging Trends in Image Processing, Computer Vision and Pattern Recognition. Morgan Kaufmann.			

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Appendix (to be compiled when submitting the complete syllabus for the programme) :

1. Mission and Vision of the University and Faculty
2. Programme Objectives or Programme Educational Objectives
3. Programme Outcomes (POs)
4. Mapping of POs to the 8 MQF domain
5. Summary of the Bloom's Taxonomy's Domain Coverage in all the Los in the format below :

Subject	Learning Outcomes (please state the learning Outcomes)	Bloom's Taxonomy Domain		
		Affective	Cognitive	Psychomotor
ABC1234	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			
DEF5678	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			

6. Summary of LO to PO measurement
7. Measurement and Tabulation of result for LO achievement
8. Measurement Tabulation of result for PO achievement