

**SUMMARY OF INFORMATION ON EACH COURSE**

1.	Name of Course	Discrete Mathematics and Probability	
2.	Course Code	TMA1211	
3.	Status of Course [Applies to (cohort) ]	Common Core for B.IT (Hons) Data Communications and Networking B.IT (Hons) Information Technology Management B.IT (Hons) Artificial Intelligence B.IT (Hons) Security Technology B.Sc (Hons) Bioinformatics	
4.	MQF Level/Stage Note : <i>Certificate – MQF Level 3</i> <i>Diploma – MQF Level 4</i> <i>Bachelor – MQF Level 6</i> <i>Masters – MQF Level 7</i> <i>Doctoral – MQF Level 8</i>	Bachelor – MQF Level 6	
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Date of previous version : - Date of current version: June 2014	
6.	Pre-Requisite	None	
7.	Name(s) of academic/teaching staff	Tan Choo Kim Pang Ying Han	
8.	Semester and Year offered	Trimester 2, Year 1	
9.	Objective of the course in the programme : The purpose of this course is to provide students with various essential discrete mathematic concepts and probability concepts.		
10.	Justification for including the course in the programme : Information Technology (IT) relies heavily on concepts from discrete mathematics and probability. The major areas of this subject include logic, proofs, set, relations, functions, induction, recursion, graph theory, algebraic structures, finite automata, probability theory and probability distributions, which provide IT students with the understanding of the logical and algebraic relationship between discrete objects as well as the ability to manipulate discrete mathematics and probability concepts in order to be successful in their future careers.		
11.	Course Learning Outcomes :	Domain	Level
	LO1 To relate discrete theory in computing.	Cognitive	Level 4
	LO2 To apply the logical and constructive knowledge and procedure in computing and to apply the probability theory and concepts in problems solving.	Cognitive	Level 3
	LO3 Describe the basic concepts of probability.	Cognitive	Level 1
	LO4 To solve the probability distributions problems	Cognitive	Level 2

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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							
13.	Assessment Methods and Types :									
	Method and Type	Description/Details						Percentage		
	1 Assignment	Written						15%		
	2 Quizzes	Written						15%		
	3 Test	Written Examination						20%		
4 Final Exam	Written Examination						50%			
14.	Mapping of assessment components to learning outcomes (LOs)									
	Assessment Components	LO1	LO2	LO3	LO4					
	Assignment	15	15	15	18.8					
	Quizzes	15	15	15	18.7					
	Test	20	20	20	-					
Final Examination	50	50	50	62.5						
15.	Details of Course-									
	Topics	Mode of Delivery (eg : Lecture, Tutorial, Workshop, Seminar, etc.) Indicate allocation of SLT (lecture, tutorial, lab) for each subtopic								
		Lecture	Tutorial							
	<b>Logic and Proofs</b>	6	3							
Proposition; Truth tables; Logical equivalence; Compound proposition; Predicate logic; Formal reasoning; Quantifiers; Proof techniques.										
<b>Set, Relations and Functions</b>	5	2								
Set Theory, Binary relations; Composition of relations; Equivalence Relations; Partially ordered sets, Hasse diagrams; From relations to functions, Properties of function (injection, surjection, bijection); inverse function; Composition of functions.										

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<p><b>Induction and Recursion</b></p> <p>Principle of mathematical induction; Recursive definitions; Introduction to primitive Recursive functions; Recursive algorithm.</p>	4	1
<p><b>Graph Theory</b></p> <p>Types of graphs; Sub-graph; Isomorphic graphs; Paths and cycle; Directed and undirected graphs and their matrix representations; Euler paths and Cycles; Hamiltonian paths and cycles; Trees.</p>	4	1
<p><b>Algebraic Structures</b></p> <p>Introduction to algebraic structures, Semigroups; Groups</p>	2	1
<p><b>Introduction to Finite Automata</b></p> <p>Finite-state machines; Deterministic and non-deterministic finite automata, and their relationship.</p>	4	2
<p><b>Probability Theory</b></p> <p>Basic of Probability Theory; Properties of Probability; Basic counting techniques; Conditional Probability; Inclusion-exclusion principle; Permutations and combinations</p>	9	2
<p><b>Discrete and Continuous Distributions</b></p> <p>Binomial Distribution, Poisson Distribution, Normal Distribution.</p>	3	1

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	<b>Joint Probability Distribution</b>	5	1
	Joint probability mass distribution and joint probability density function; marginal distribution; joint conditional distribution; expected value, covariance.		
	<b>Total</b>	42	14
	<b>Total Student Learning Time (SLT)</b>	<b>Face to Face / Guided Learning</b>	<b>Independent Learning</b>
	Lecture	42	42
	Tutorials	14	14
	Laboratory/Practical	0	0
	Presentation	0	0
	Assignment	0	12
	Mid Term Test	2	5
	Final Exam	2	20
	Quizzes	7 times	7
	Sub Total	60	100
	Total SLT	<b>160</b>	
16.	Credit Value	<b>160/4=4</b>	
17.	Reading Materials :		
	Textbooks		
	1. Kenneth Rosen, (2012). Discrete Mathematics and Its Applications, 7th edition, McGraw-Hill.		
	Reference Material (including 'Statutes' for Law)		
	1. Richard Johnsonbaugh, (2009). Discrete Mathematics, Prentice-Hall, Inc.		
	2. Ross, K.A. and Wright, C.R.B., (2003). Discrete Mathematics, 5/E, Prentice-Hall.		
	3. John A. Dossey, (2005). Discrete Mathematics, 5/E, Harper Collins.		
	4. James L.Hein, (2009). Discrete Structures, Logic, and Computability, Jones and Bartlett Publishers, USA.		
	5. Susanna S. Epp, (2003). Discrete Mathematics with Applications, Second Edition, Brooks/Cole Publishing.		
	6. Malik, D. S. and Sen, M. K., (2004). Discrete Mathematics: Theory and Applications, Cengage Learning.		

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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