MULTIMEDIA UNIVERSITY®

COURSE INFORMATION

1 .	**Name of Course**	Discrete Structures & Probability
2 .	**Course Code**	TMA1201
3 .	**Type of Course** (e.g. : Core, major, elective etc.)	Core
4 .	**Synopsis**	The course aims to provide students the basic knowledge of discrete mathematics and probability which served as foundation to more advance courses in computer science. The topics include set, function and relation, logic and proof technique, complexity of algorithm, graph, finite state automaton, combinatoriy and probability.
5 .	**Version** (State the date of theSenate's approval - previous and the current approval date)	Current: January 2018 Previous: June 2016
6 .	**Name(s) of Academic Staff**	Foo Lee Kien Wan Norshahida Mohd Isa Khor Chia Ying
7 .	**Semester and Year Offered**	Trimester 1 (Beta)
8 .	**Credit Value**	4
9 .	**Pre-Requisite**	NIL

10 . **Objective of the course in the programme:**

To equip students with knowledge of various discrete structures and basic concepts of probability.

11 . **Justification for including the course in the programme:**

To provide basic knowledge of discrete structures and probability required for computer science courses.

12 . **Course Learning Outcomes (CLO)**

		Domain	Level
CLO1:	Perform basic operations on discrete structures.	Cognitive	2
CLO2:	Interpret logic and construct proofs.	Cognitive	3
CLO3:	Interpret various concepts on graphs and employ related algorithms.	Cognitive	3
CLO4:	Apply principles of discrete probability to calculate probabilities and expectations of simple	Cognitive	3

13 . **Mapping of the Course Learning Outcomes to the Programme Learning Outcomes, Teaching Methods and Assessment:**

Course Learning Outcomes (CLO) (Must tally with CLOs in item 12)	Programme Learning Outcomes (PLO)												Teaching Methods	Assessment Method
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12		
CLO1		✓	✓										Lecture / Tutorial	Test / Quizzes / Final Exam
CLO2		✓	✓										Lecture / Tutorial	Test / Quizzes / Final Exam
CLO3		✓	✓										Lecture / Tutorial	Test / Quizzes / Final Exam
CLO4		✓	✓										Lecture / Tutorial	Quizzes / Final Exam
Total		**4**	**4**										*Indicate the relevancy between the CLO and PLO by ticking "✓" the appropriate relevant box (This description must be read together with standards 2.1.2, 2.2.1, and 2.2.2 in Area 2 – pages 16 & 18 of COPPA 2.0)*	

14 . **Transferable Skills:**

Transferable Skill	How it is developed	Assessment
logical thinking	lectures and tutorials	Quizzes, Test and Final Exam
problem solving	lectures and tutorials	Quizzes, Test and Final Exam

15 . **Distribution of Student Learning Time (SLT)**

	Course Content Outline	**CLO	Teaching and Learning Activities – Guided Learning (F2F)* *L	*T	*P	*O	Guided Learning (NF2F)*	Independent Learning (NF2F)*	Total SLT
1	**Set** Sets, basic definitions, properties and identities.	**1**	2	2				4	8
2	**Logic** Propositions; truth tables; implication and equivalence; tautology, consistency and contradiction; first order logic, quantifiers; proof techniques.	**2**	9	4			4	13	30
3	**Relation** Function; definition of function; one to one and onto; inverse function; composition of functions; binary relations; properties of binary relation; equivalence relations, partial order relations; composition of relations.	**1**	5	4				9	18
4	**Induction and Recursion** Principle of mathematical induction; recursive definitions.	**2**	1	2			6	3	12
5	**Introduction to Algorithm** Recursive algorithm; introduction to complexity of an algorithm.	**3**	2	2				4	8

6	**Graph Theory** Directed and undirected graphs and their matrix representations; eulerian paths and cycles; hamiltonian paths and cycles; trees, binary tress, binary search tree and tree traversal.	**3**	5	3				8	16
7	**Combinatorics** Basic counting techniques; permutations and combinations; inclusion-exclusion principle; binomial theorem; ordered and unordered partitions; pigeonhole principle.	**4**	2	2			4	4	12
8	**Probability** Sample space, discrete probability, random variables; discrete distributions, expected value, variance and moments; conditional probability, Bayes' theorem, independent events; special probability distributions (Bernoulli, Binomial, Poisson and Normal).	**4**	8	5				13	26
9	**Finite State Automata** Finite state automata, using automata to recognize languages.	**3**	3	2				5	10
								Total SLT	**140**

SUMMATIVE ASSESSMENT

1. Continuous Assessment	**Percentage %**	**Total SLT**
Test	30%	6
Quizzes	20%	0
Total SLT for Continuous Assessment		**6**

2. Final Assessment	**Percentage %**	**Total SLT**	
		F2F	**ILT**
Final Exam	50%	2	12
Total SLT for Final Assessment (F2F + NF2F)		**14**	
Grand Total	**100%**	**160**	

****Indicate the CLO based on the CLO's numbering in Item 12.**
***L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face**

16 . **Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room):**

17 . **Main References:**

Epp, S. (2011). Discrete Mathematics with Applications,4th ed. Brooks/Cole Cengage Learning.

18 . **Additional References:**

Rosen, K. (2012).Discrete Mathematics and Its Applications, 7th ed. McGraw-Hill.
Kolman, B., Busby, R.C. and Ross, S.C. (2013).Discrete Mathematical Structures, 6th ed. Pearson.

Note:

Cells shaded light grey contain formulas / fixed values. Edit these formulas only if needed.