INTI INTERNATIONAL UNIVERSITY
COURSE STRUCTURE

PROGRAMME: DIPLOMA IN INFORMATION AND COMMUNICATIONS TECHNOLOGY

1.	**NAME OF COURSE/MODULE: DISCRETE MATHEMATICS**
2.	**COURSE CODE: MAT1104**
3.	**RATIONALE FOR THE INCLUSION OF THE COURSE/MODULE IN THE PROGRAMME:** The course provides necessary mathematics knowledge to an IT student. Mathematics relates students to various real-life contexts and enables students to think flexibly, critically and logically in solving a real-life problem. This module will provide students with a good foundation in the basic mathematical knowledge.

4. **STUDENT LEARNING TIME (SLT)**

	Total Face to Face					Total Student Independent Learning Time	
	L	**T**	**P**	**O**	**A**	**OL**	**IL**
L = Lecture T = Tutorial P = Practical O = Others A = Assessment OL = Online Learning IL = Independent Learning	24	14	0	4	6	14	70

5.	**CREDIT VALUE:** 3
6.	**PREREQUISITE:** MAT1103 Fundamentals of Mathematics
7.	**LEARNING OUTCOMES:** On completion of the course, students will be able to: 1. Solve different types of discrete mathematical problems. 2. Solve various forms of logical and Boolean algebra problems. 3. Perform operations on sets, functions and relations. 4. Apply the concepts of coding and tree in simple problems.
8.	**SYNOPSIS:** This course is designed to understand the relationship between mathematics and computing. A basic course, which introduces them to topics on bases and number representation, computer representation and arithmetic, Boolean algebra, propositional calculus, sets and functions, coding and graphs. This course will provide students with a good foundation in the basics of mathematics as it relates to computing and able to develop a logical thinking process in students.
9.	**MODE OF DELIVERY:** Lectures and tutorials. Lectures are conducted both face-to-face and online.
10.	**ASSESSMENT METHODS AND TYPES:**

Method	Types	Weightage (%)
Continuous Assessment	Test 1	20
	Test 2	20
	Assignments/Quizzes	20
Summative Assessment	Final Examination	40

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Senior Officer
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11. **CONTENT OUTLINE OF THE COURSE/MODULE AND THE SLT PER TOPIC:**

Sessions	Topics	LO	L	T	P	OL	Total		
							O	A	IL
1 & 2	**Bases and Number Representation** Real numbers and the decimal number system. The binary number system. Conversion from decimal to binary. The octal and hexadecimal systems. Arithmetic in non-decimal bases.	1	2	1	0	1	4	6	70
3 – 6	**Computer Representation and Arithmetic** Representing numbers in a computer. Representing integers. Arithmetic with integers. Representing real numbers. Arithmetic with real numbers. Binary coded decimal representation.	1	4	2	0	2			
7 & 8	**Counting** The basic of counting. Counting and partitions. The pigeonhole principle. Permutations and combinations.	1	2	1	0	1			
9 & 10	**Advanced Counting Techniques** Recurrence relations. Solving recurrence relations. Test 1	1	2	1	0	1			
11 – 14	**Boolean Algebra** Boolean functions. Representing Boolean functions. Logic gates. Minimization of circuits (Karnaugh maps). Test 1	2	4	2	0	2			
15 – 18	**Propositional Calculus** Statements. Logical connectives. Logical equivalence. Truth tables. Formal proof.	1, 2	2	2	0	2			
19 – 24	**Sets and Functions** Naïve set theory. Set operations. Cardinality. Functions and their algebra. Relations. Quantifiers (as notation). Test 2	3	6	3	0	3			
25 & 26	**Coding** Basic idea of information. Simple coding schemes. Idea of error correction.	4	1	1	0	1			
27 & 28	**Graphs** Definitions of graph and tree.	4	1	1	0	1			
	TOTAL		24	14	0	14	4	6	70

Learning Outcome (LO), Lecture (L), Tutorial (T), Practical (P), Other (O), Assessment (A), Online Learning (OL), Independent Learning (IL).

12.	**MAIN REFERENCE(S) SUPPORTING COURSE:** • Rosen, KH. Discrete Mathematics and its Applications. 7th ed., McGraw Hill, 2012. **ADDITIONAL REFERENCES:** • Johnsonbaugh, R. Discrete Mathematics. 7th ed., Prentice Hall, 2009. • Grossman, P. Discrete Mathematics for Computing. 3rd ed., Palgrave Macmillan, 2009. • Edward RS. Mathematics: A Discrete Introduction. 3rd ed., Brooks/Cole, 2013. • Susanna SE. Discrete Mathematics with Applications. 4th ed., Brooks/Cole, 2011. • Ferland, K. Discrete Mathematics. 1st ed., Brooks/Cole, 2009.
13.	**OTHER ADDITIONAL INFORMATION:** **Final Examination Format** Duration: 2 hours Answer any FOUR out of FIVE structured-type questions. **Grading Scale** A+ (90-100), A (80-89), A- (75-79), B+ (70-74), B (65-69), B- (60-64), C+ (55-59), C (50-54), C- (45-49), D (40-44), F (0-39) **A student who obtains a grade C- (45 -49 marks) in a 100% coursework module is required to resubmit the coursework component determined by the lecturer and ascertained at the Exam Board. Resubmission marks will be capped at a maximum of 50 marks or a grade C.** **A passing mark can only be achieved when the student attempts both the coursework and final exams.**

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