LIMKOKWING UNIVERSITY OF CREATIVE TECHNOLOGY
— SIERRA LEONE —

Math108
Computerized Mathematics

MODULE DETAILS

Course Location	:	Freetown, Sierra Leone
Examiner	:	Mr. Abass Conteh
Contact details (email)	:	abass.conteh@limkokwing.edu.sl
Co-Examiners	:	Mohamed Vandi
Pre-requisite	:	NIL
Credits Amount	:	3
Contact hours per week	:	3 hours
No. of weeks	:	11weeks contact + 1 week ClassTest + 1 week Non-Contact +1 week Final Exam
No. of assignments	:	2
No. of written exam	:	1 Class Test + 1 Final Exam
Teaching Pattern	:	Lectures and tutorials
Portfolio	:	N/A
Venue	:	Classroom

Prepared by:	Mary	Approved by:	AQA
Signature:		Signature:	
Verify By:	Oluwatosin		
Signature:			

This document comprises the following:
- Essential Information
- Specific Module Information
- Module Rules & Regulations
- Grades
- Plagiarism
- Module Introduction
- Module Aims & Objectives
- Learning Outcome
- Specific Generic Learning Skills
- Syllabus + Lecture Outline
- References
- Assignment Schedule
- Assessment Criteria
- Specific Criteria

Other documents as follows will be issued to you on an ongoing basis throughout the semester:
- Handouts for Assignments
- Submission Requirements + Guidelines

1.0 MODULE INTRODUCTION

The main aim of this module is to give the students a foundation of mathematical and statistical knowledge in relation to programming and computer tasks. Developing an algorithm is a very difficult task and therefore students needs this mathematical foundation to enable them think through problems by logically reasoning to come out with the best solution out of the many possible solutions.

2.0 MODULE AIMS AND OBJECTIVES

- To understand the statistical and mathematical problems that they will encounter with computer related task.
- Understand logic (including quantifiers), proofs by resolutions and mathematical induction.

3.0 LEARNING OUTCOME

Students will acquire the abilities to:

- Understand logic (including quantifiers), proofs by resolutions and mathematical induction
- Be able to understand Sets, sequences, strings, sum of product notations and number systems.
- Be familiar with Boolean Algebra that emphasizes the relation of Boolean Algebra and combinatorial circuits

4.0 SPECIFIC GENERIC LEARNING SKILLS

Upon completion of the module, student will acquire skills in:

- Analysis
- Problem Solving
- Analytical Skills

5.0 ESSENTIAL INFORMATION

- All modules other than electives are **'significant modules'**.
- As an indicator of workload one credit carries and additional 2 hours of self-study per week. For example, a module worth 3 credits require that the student spends an additional 6 hours per week, either reading, completing the assignment or doing self-directed research for that module.
- Submission of ALL assignment work is compulsory in this module. A student cannot pass this module without having to submit ALL assignment work by the due date or an approved extension of that date.
- All assignments are to be handed on time on the due date. Students will be penalized 10 percent for the first day and 5 percent per day thereafter for late submission (a weekend or a public holiday counts as one day). Late submission, after the date Board of Studies meeting will not be accepted.
- Due dates, compulsory assignment requirements and submission requirements may only be altered with the consent of the majority of students enrolled in this module at the beginning/early in the program.
- Extensions of time for submission of assignment work may be granted if a medical certificate accompanies the application for extension.
- Overseas travel is not an acceptable reason for seeking a change in the examination schedule.
- Only the Head of Faculty can grant approval for extension of submission beyond the assignment deadline.
- Re-submission of work can only receive a 50% maximum pass rate.

- Supplementary exams can only be granted if the level of work is satisfactory **AND** the semester work has been completed.
- Harvard referencing and plagiarism policy will apply on all written assignments.

6.0   SPECIFIC MODULE INFORMATION

- Attendance rate of 80% is mandatory for passing module at the end of the semester.
- All grades are subject to attendance and participation.
- Absenteeism at any scheduled presentations will result in zero mark for that presentation.
- Visual presentation work in drawn and model form must be the original work of the student.
- The attached semester program is subject to change at short notice.

7.0   MODULE RULES AND REGULATIONS

Assessment procedure:
- These rules and regulations are to be read in conjunction with the UNIT AIMS AND OBJECTIVES
- All assignments/projects must be completed and presented for marking by the due date.
- Marks will be deducted for late work and invalid reasons.
- The student in person must deliver all assignments to the lecturer concerned. No other lecturer is allowed to accept students' assignments.
- All tests/examinations are compulsory.
- Students must sit the test/examination on the notified date.
- Students are expected to familiarize themselves with the test/examination timetable.
- Students who miss a test/examination will not be allowed to pass.
- **Students who miss TESTS or ASSIGNMENTS without a genuine reason WILL NOT be allowed to sit for the EXAMINATION, resulting in them repeating the module.**
- Any scheduling of tutorials, both during and after lecture hours, is TOTALLY the responsibility of each student. Appointments are to be proposed, arranged, confirmed, and kept, by each student. Failure to do so in a professional manner may result in penalty of grades. Tutorials WITHOUT appointments will also NOT be entertained.
- Note that every assignment is given an ample time frame for completion. This, together with advanced information pertaining deadlines gives you NO EXCUSE not to submit assignments on time.

8.0   PLAGIARISM, COPYRIGHT, PATENTS, AND OWNERSHIP OF WORK: STUDENT MAJOR PROJECT, THESES & WORKS

See LIMKOKWING, HIGH FLYERS HANDOUT, pg. 5.

9.0   REFERENCE

Books (Main Reading):
- Seymour L. and Marc L. L.(2007) Theory and Problems of Discrete Mathematics, Third Edition. Published by McGraw-Hill Companies, Inc.
- Kenneth H.R. (2012) Discrete Mathematics and Its Applications, Seventh Edition. Published by McGraw-Hill.

10.0 ASSESSMENT

DESCRIPTION	ISSUE DATE	DUE DATE	%
Attendance	Weekly	Weekly	5%
Assignment 1	Week 2	Week 4	10%
Assignment 2	Week4	Week12	15%
Class Test	Week 7	Week 7	30%
Final Exam	Week 15	Week 16	40%
TOTAL			**100%**

11.0 ASSIGNMENT CRITERIA

- Each assignment will be handed out with the project brief and will vary, depending on the teaching and learning objectives of the specific assignment.
- Each student will receive a completed assessment sheet back with their marks, thereby giving student feedback on each set criterion and the project as a whole.
- All submission must be made directly to the lecturer-in-charge.

12.0 GRADES

In the assessment of all student works, the grading system is standardized for all subjects in all programmes. The grading system used is as follows;

Marks	Grade	Grade Points	Description
90 – 100	A+	4.00	Pass with Distinction
85 – 89	A	4.00	
80 – 84	A-	4.00	
75 – 79	B+	3.67	Pass with Merit
74 – 70	B	3.33	
65 – 69	B-	3.00	
60 – 64	C+	2.67	Pass
55 – 59	C	2.33	
50 – 54	C-	2.00	
0 – 49	F	0.00	Fail
	PX	1.00	Pass (Supplementary work submitted)
	PC	1.00	Pass Conceded
	EXP	0.00	Exempted
	X	0.00	Pending Supplementary Assessment
	DNC	0.00	Did not complete
	DEF	0.00	Deferred
	GNS	0.00	Grade Not Submit
	ANN	0.00	Result Annulled to Misconduct

13.0 ASSESSMENT CRITERIA

Process of grading and criteria used to determine the grades, passes and high distinctions.

90-100, A+, Publishable. Assignment is of sufficient substance and style to be submitted to a referred journal for publication or public presentation.
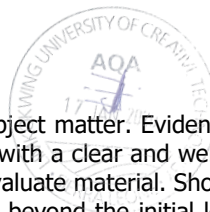
85-89, A, Outstanding. Superior understanding of the subject matter. Evidence of original thinking and an extensive knowledge base. Careful, concise, critical analysis with a clear and well-argued hypothesis based on the material. Shows a capacity to analyze, synthesize, and evaluate material. Shows a grasp of all the scholarly issues involved. Shows evidence of learning being extended beyond the initial learning situation. Clear thesis and conclusion. Well-researched and documented. Stylistically flawless.

80-84, A-, Excellent. Superior understanding of the subject matter. A careful analysis with some precision and attention to the details of the material. Shows some critical capacity and analytic ability and some original thinking. Needs a bit of fine-tuning of the details. Clear thesis and conclusion. Good research and documentation. Stylistically flawless.

75-79, B+, Excellent. Solid understanding of the subject matter. Good analysis and some critical reasoning. Reasonable understanding of relevant issues and familiarity with the material. Demonstrates a solid understanding of the relationship or connections among the basic concepts. Needs to be more concise or precise in details and more careful in forming arguments. Stylistically sound.

70-74, B, Good. Generally accurate account of the subject matter with acceptable analysis and some critical reasoning. Some interaction with relevant material. Demonstrates some understanding of the relationship or connection among the basic concepts. Needs more precision and attention to details and greater precision in the use of arguments. Some careless stylistic errors.

65-69, B-, Fine. Generally accurate description of the subject matter and an adequate grasp of the critical issues and ideas involved. Demonstrates rudimentary understanding of the relationship or connection among the basic concepts. Needs more attention to detail and better use of arguments. Some careless stylistic errors.

60-64, C+, Average. Acceptable treatment of the subject matter. Demonstrates an understanding of the basic facts, vocabulary, details, and elemental concepts. Shows an ability to deal with simple issues arising out of the material. Needs to explore the subject matter more fully and formulate ideas more clearly. Closer attention should be given to stylistic elements including sentence structure and paragraph organization.

55-59, C, Adequate. Generally acceptable treatment of the subject matter and issues. Demonstrates an awareness of the basic facts, vocabulary, details, and elemental concepts. Impressionistic or vague at points. Shows that the learning experience was profitable. Lacks clarity in formulating the issues and shows little or no evidence of critical reflection on the issues or data. Closer attention should be given to grammar, spelling, and punctuation.

50-54, C-, Minimally Acceptable. Adequate understanding and treatment of the data and issues, but imprecise, impressionistic or vague. Lacks clarity in expressing the issues and shows no evidence of critical reflection on the issues or data. Major problems related to issues of style.

0-49, F, Inadequate. Sloppy, imprecise or careless discussion of the material with little or no evidence of critical reflection, stylistically flawed.

X Grade, In the case of a student who is granted supplementary work/s submission by the faculty, a grade S should be entered. An S grade is an interim grade until the supplementary work/s is/are submitted and assessed at the earliest possible timeframe. After a student has passed the supplementary work/s, the student shall be awarded with a normal grade. This is limited to 'C' band.

DNC (Did Not Complete), In the case of a student who has registered, is on a class list, has attended some classes, but has not submitted any work, a grade of DNC should be entered. A 0.00 grade point is attached to this grade.

GNS (Grade Not Submitted), In the case of an emergency or unforeseen circumstances and grade/s is/are yet to be submitted at time of Senate eg waiting for Internship to be completed, a GNS should be entered.

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DEF (Deferred), In the case of a student who has registered, is on a class list, but has decided to drop the module after the approved dropped date ie. Week 4, a grade of DEF should be entered. There is no grade point attached to this grade.

EXP (Exempted), Refer to Section Exemption of Modules or Advance Standing and Credit Transfer in Academic Quality Assurance Manual.

MATH 108 SYLLABUS + LECTURE OUTLINE:

Week:	1
LECTURE 1:	**NUMBER SYSTEM AND COMPUTER CODES**
Lecture Synopsis:	1. Decimal System
	2. Binary System and Binary Arithmetic
	3. Octal and Hexadecimal Systems
	4. Binary Codes
	5. Errors
	6. Computer Arithmetic
Handout:	**Module Outline, Lecture Notes 1**
Tutorials:	

Week:	2
LECTURE 2:	**LOGIC AND TRUTH TABLES**
Lecture Synopsis:	1. Introduction
	2. Propositions
	3. Conditional and Biconditional Statements
	4. Converse, Contrapositive, and Inverse
	6. Logic and Bit Operations
Handout:	**Lecture Notes 2,**
	Issue individual assignment (Assignment 1)
Tutorials:	

Week:	3
LECTURE 3:	**SET THEORY**
Lecture Synopsis:	1. Sets and Elements, Subsets
	2. Universal Set, Empty Set, Disjoint Sets, Finite set, Infinite set
	3. Set Operations (union, intersection of set, Complements, Differences etc)
	4. Venn Diagram
	5. Algebra of Sets, Duality
	6. Mathematical Induction
Handout:	**Lecture Notes 3**
Tutorials:	

Week:	4
LECTURE 4:	**PROPERTIES OF THE INTEGERS**
Lecture Synopsis:	1. Fundamental Theorem of Arithmetic
	2. Order and Inequalities, Absolute Value
	3. Mathematical Induction

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4. Division Algorithm
5. Divisibility, Primes
6. Greatest Common Divisor, Euclidean Algorithm
7. Fundamental Theorem of Arithmetic
8. Congruence Relation

Handout:	***Lecture Notes 4***
Tutorial:	***Submission of individual assignment (Assignment 1)***
	Issue Assignment 2

Week:	5
LECTURE 5:	**FUNCTIONS AND ALGORITHMS**

Lecture Synopsis:
1. Functions
2. One-To-One, Onto, and Invertible Functions
3. Sequences, Indexed Classes of Sets
4. Recursively Defined Functions
5. Cardinality
6. Algorithms and Functions
7. Complexity of Algorithms

Handout:	***Lecture Notes 5***
Tutorials:	

Week:	6
LECTURE 6:	**RELATIONS**

Lecture Synopsis:
1. Relations
2. Pictorial Representatives of Relations
3. Composition of Relations
4. Types of Relations
5. Closure Properties
6. Equivalence Relations

Handout:	***Lecture Notes 6***
Tutorials:	

Week:	7
	CLASS TEST

Week:	8
	MID SEMESTER BREAK

Week:	9
LECTURE 7:	**TECHNIQUES OF COUNTING AND VECTORS AND MATRICES**

Lecture Synopsis:
1. Basic Counting Principles
2. Mathematical Functions
3. Permutations and Combinations
4. Vectors and Matrices
5. Matrix Addition and Scalar Multiplication
6. Matrix Multiplication
7. Transpose, Determinants and Inverse

Handout:	***Lecture Notes 7***
Tutorials:	

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Week:	10
LECTURE 8:	**BOOLEAN ALGEBRA AND KARNAUGH MAPS**
Lecture Synopsis:	1. Basic Definitions
	2. Duality
	3. Boolean Algebras as Lattices
	4. Logic Gates and Circuits
Handout:	***Lecture Notes 8***
Tutorials:	

Week:	11
LECTURE 9:	**PROBABILITY**
Lecture Synopsis	1. Introduction to Probability
	2. Sample Space and Events
	3. Finite Probability Spaces
	4. Conditional Probability
	5. Independent Events
	6. Random Variables
Handout:	***Lecture Notes 9***
Tutorials:	

Week:	12
LECTURE 10:	**GRAPHS, DIRECTED GRAPHS**
Lecture Synopsis:	1. Graphs and Multigraphs
	2. The Undirected and Directed Graphs
	3. Bipartite Graphs
	4. Planar Graphs
Handouts:	***Lecture Notes 10***
Tutorials:	***Submission of Assignment 2***

Week:	13
	REVISION WEEK

Week:	15/16
	FINAL EXAMINATION

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