

PROG 101

INTRODUCTION TO STRUCTURED PROGRAMMING

Course Location	: Freetown, Sierra Leone
Examiner	: Richard Aruna
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Co-Examiner	: Richard Aruna, Aiah James
Pre-requisite	: NIL
Credits Amount	: 3 credits
Contact hours per week	: 3 hours (1 hour lecture & 2 hours tutorial)
No. of weeks	: 13 weeks contact + 1week Mid semester Break + 2 weeks Final Examination
No. of assignments	: 2 Assessments
No. of written exam	: 2 (1 Mid Semester Test + Final Examination)
Portfolio	: N/A

Prepared by : Richard Aruna

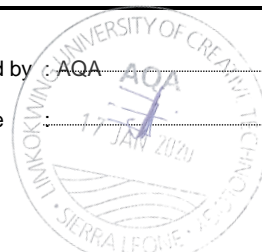
Approved by : AQA

Signature : _____ Date _____

Signature : _____ Date _____

Verified by : Oluwatosin Ayorinde

Signature : _____ Date _____



This document comprises the following:

1. Essential Information
2. Specific Module Information
3. Module Rules & Regulations
4. Grades
5. Plagiarism
6. Module Introduction
7. Module Aims & Objectives
8. Learning Outcome
9. Specific Generic Learning Skills
10. Syllabus + Lecture Outline
11. References
12. Assignment Schedule
13. Assessment Criteria
14. 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 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 the application for extension is accompanied by a medical certificate.
- **Overseas travel is not an acceptable reason for seeking a change in the examination schedule.**
- **Only the Head of School** 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.

2.0 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.

3.0 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 familiarise 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.

4.0 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	GPA& CGPA	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

Grade	GPA& CGPA	Description
PX	1.00	Pass (supplementary work submitted)
PC	1.00	Pass Conceded
EXP	0.00	Exempted
X	0.00	Outstanding Supplementary Assessment
DNC	0.00	Did not Complete
DEF	0.00	Deferred
GNS	0.00	Grade Not Submitted
ANN	0.00	Result Annulled to Misconduct

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

See LIMKOKWING, HIGH FLYERS HANDOUT, pg. 12

6.0 Module Introduction

This module introduces basic programming concepts through the C++ programming language. The focus of the module is on developing practical programming skills that are useful to solve common computing challenges. The major area of studies of this course includes basic problem solving skills using pseudocode & flowchart; fundamental C++ syntaxes such as data types, expressions, operators, program structures – selection, repetition, functions, arrays, strings, pointers, input and output.

7.0 MODULE AIMS AND OBJECTIVES

This module aims at the following:

- To provide a thorough grounding in basic structured programming techniques using C++ programming language.
- Students will be exposed to the importance of using appropriate control structures, algorithms and syntaxes of C++ programming language.

8.0 LEARNING OUTCOME

Upon completion of the module, student will:

- Write structured programs in C++ programming language using up-to-date C++ compilers
- Solve common daily and business-related problems using the C++ programming language
- Identify and correct compile-time, run-time and style errors in structured programs containing advanced language features such as arrays and various built-in libraries
- Use fundamental programming features such as control structures, functions, arrays, pointers, sounds, colours, reading and writing data to files together with their implementation in C++

9.0 SPECIFIC GENERIC LEARNING SKILLS

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

- Solving problems using 6 main steps
- Writing pseudocode and drawing flowcharts prior to coding
- Reading and translating pseudocode and flowcharts into correct programming syntaxes
- Typing/writing C++ programs with good programming practices and paradigms
- Writing an organized and meaningful C++ source codes which are easy to read & understand
- Identify coding errors and run-time errors of a program



10.0 UNIT SYLLABUS + LECTURE OUTLINE:

Week:	1
LECTURE 1:	INTRODUCTION TO PROGRAMMING LANGUAGES
<i>Lecture Synopsis:</i>	<i>Programming Languages</i> <i>History of C & C++</i> <i>Problem Solving</i> <i>Typical C++ Environment</i>
<i>Handout:</i>	<i>Module outline, Lecture 1 PowerPoint handouts</i>
LAB SESSION 1:	INTRODUCTION TO C++ COMPILERS

Week:	2
LECTURE 2:	INTRODUCTION TO C++ PROGRAMMING
<i>Lecture Synopsis:</i>	<i>First Program</i> <i>Comments</i> <i>Pre-processor Directive</i> <i>Namespaces</i> <i>Main function</i> <i>Cout & cin statements</i> <i>Escape characters</i> <i>Variables</i> <i>Memory Concepts</i> <i>Debugging</i>
<i>Handout:</i>	<i>Lecture 2 PowerPoint handouts</i>
LAB SESSION 2:	INTRODUCTION TO C++ PROGRAMMING Issue of Individual Assignment 1



Week:	3
LECTURE 3:	TYPES, OPERATORS & EXPRESSIONS
<i>Lecture Synopsis:</i>	<i>Variable Names</i> <i>Data Types and Sizes</i> <i>Constants</i> <i>Type Casting</i> <i>Manipulators & Flags</i> <i>Arithmetic Operators</i> <i>Equality & Relational Operators</i> <i>Logical Operators</i> <i>Increment and Decrement Operators</i> <i>Assignment Operators</i>
<i>Handout:</i>	<i>Lecture 5 PowerPoint handouts, Tutorial 4</i>
LAB SESSION 3:	TYPES, OPERATORS & EXPRESSIONS Due date for assignment1

Week:	4
LECTURE 4:	CONTROL STRUCTURES
<i>Lecture Synopsis:</i>	<i>Sequential Programs</i> <i>Selection Programs</i> <i>if control structure</i> <i>if...else control structure</i> <i>switch control structure</i> <i>Nesting selection structures</i> <i>Structured Programming</i> <i>Control Programming</i>
<i>Handout:</i>	<i>Lecture 4 PowerPoint handouts, Tutorial 2</i>
LAB SESSION 4:	CONTROL STRUCTURES

Week: 5
LECTURE 5: FUNCTIONS
Lecture Synopsis: Introduction to Functions
 Basics of Functions – Definitions, Prototypes
 3 types of Functions – void, returns single value, pass by reference

Handout: Lecture 6 PowerPoint handouts, Assignment 2, Tutorial 5
LAB SESSION 5: FUNCTIONS

Week: 6
LECTURE 6: ARRAY
Lecture Synopsis: Introduction to Arrays
 Declaring Arrays
 Multiple-Subscripted Arrays
 Examples Using Arrays
 Sorting Arrays

Handout: Lecture 7 PowerPoint handouts, Tutorial 7
LAB SESSION 6: ARRAY

Week: 7
Mid Term Test

Week: 8
SEMESTER BREAK

Week: 9
LECTURE 7: CHARACTER AND STRING PROCESSING
Lecture Synopsis: Fundamentals of Characters and Strings
 String Manipulation
 Functions of the String-Handling Library
 Introducing String Header File
 string Assignment & Concatenation
 Comparing strings
 Substrings
 SWAPPING STRINGS
 string Characteristics
 Finding Strings and Characters in a string

Handout: Lecture 8 PowerPoint handouts, Tutorial 9



LAB SESSION 7: STRING-HANDLING

Week: 10

LECTURE 8: I/O AND FILE STREAMS

Lecture Synopsis:

Introduction to I/O and Streams

Stream Variables

Declaring & using Input-file Stream Variable

Declaring & using Output-file Stream Variable

Opening & Closing file

READING & WRITING FILE

Handout:

Lecture 8 PowerPoint handouts, Tutorial 8

LAB SESSION 10: I/O AND FILE STREAMS

Week: 11

LECTURE 9: POINTER

Lecture Synopsis:

Introduction to Pointer

Pointer Variable

Pointer Variable Declarations

Pointer Variable Initialization

Pointer Operators

Calling Functions by Reference

Pointer Expressions and Pointer Arithmetic

Relationship Between Pointers and Arrays

Arrays of Pointers

Handout:

Lecture 10 PowerPoint handouts, Tutorial 8

LAB SESSION 9: I/O AND FILE STREAMS

Week: 12

Consultation Week

Tutorials

Week: 13

Group project presentation

WEEK 14

Revision week

Week: 15/16

FINAL EXAMINATION (date will be announced)

11.0 REFERENCES

- Deitel & Deitel, (2008), C++: How to Program, 6th Edition, Prentice Hall.
- Stroustrup, Bjarne, (2001), The C++ Programming Language, 3rd edition, Pearson Education.
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- Walter, Savitch, (2006), Problem Solving with C++, 6th edition, Addison Wesley.
- Dawson, Michael, (2004), Beginning C++ Game Programming, 1st edition, Thomson Course Technology.
- Kenneth Lambert, Douglas W. Nance, (2001), Fundamentals of C++: Introductory, 2nd Edition, Course Technology Thomson Learning.

12.0 ASSIGNMENT SCHEDULE

Assignment description	issue date	due date	%
Individual Assignment	week 2	week 4	10%
Mid Term Test	week 6	week 6	20%
Group Project Assignment	Week 4	week 12/13	30%
Attendance	week 1	week 14	5%
FINAL EXAMINATION	week 13	week 16	35
TOTAL			100%

13.0 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.

14.0 Specific 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.

S 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.

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.