



Technical University of Mombasa

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## CSE 4101: INTRODUCTION TO PROGRAMMING

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### INTRODUCTION

The purpose for this unit is to introduce the learner to the structured programming paradigm and general problem solving techniques in programming. It will strive to first discuss the need for programming in computing and explain the basic structure of a program. It will also, help in introducing problem solving techniques in programming and present the imperative structures of a program. Further, it will also discuss the concept of sub programs: functions and subroutines.

### Course Description

#### Session One: What is and Why Programming?

Computer system models: special, general purpose and the Von Neumann Model. Define the concept of program, programming and also know why programming is necessary in computing.

#### Session Two: C Program Structure

The C program structure. The concept of a statement and hence the output statement. Compiling, debugging and executing a C program in an integrated development environment (IDE).

#### Session Three: Input Statement



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The C input statement; introduce the concept of syntax, semantics. Introduce systematic approach to solving programming problems. Discuss the concept of a variable and hence a declaration statement. Also take a look at the assignment statement, expression and operator (arithmetic operators).

#### **Session Four: Web Conference Meeting**

- Discussion on the previous sessions covered
- Prepare for a formal continuous assessment test

#### **Session Five: Formal Continuous Assessment Test (CAT)**

- Take online CAT - I

#### **Session Six: Control Structures**

What are control structures? Explain the three control structures, namely: sequential, selection, and iteration structures in general terms. Give the construct used for sequential structure and then followed by the selection structure. Explain the three if constructs: one – way if, two – way if and multiple if constructs. Give the alternative for the multiple if construct in C which is switch ... case construct. Explain the concept of conditional expression and how different it is from an arithmetic expression. Conditional operators.

#### **Session Seven: Iteration Structure**

Distinguish between the definite and indefinite loop structure, hence their implementation constructs in C. Explain the concept of infinite loop structure as a deviation of the indefinite loop structure.

#### **Session Eight: Arrays**

Define the term array as a data structure, relate it with the variable as a basic data structure. Traverse (accessing) array elements – array index.

#### **Session Nine: Web Conference Meeting**

- Discussion on the previous sessions covered
- Prepare for a formal continuous assessment test



## **Session Ten: Formal Continuous Assessment Test (CAT)**

- Take online CAT - II

## **Session Eleven: Arrays and sorting**

Elaborate on the concept of algorithms, and how they are important in problem solving. Simple sorting algorithms: bubble sort, insertion sort.

## **Session Twelve: Functions**

The concept of a sub program, the two types of subprograms – function and sub routine. Implementing functions in C: function prototype and function definition; argument and parameters; function call.

## **Session Thirteen: Files**

Defining and Opening a file, Closing Files, Input/output Operations on Files.

## **Session Fourteen: Web Conference Meeting**

- Discussion on the previous sessions covered
- Summary of the entire course
- Prepare for Examination

## **Session Fifteen: Revision/Examination**

## **Session Sixteen: Revision/Examination**

## **Learning Outcomes**

By the end of this course the student will be able to:

- Solve computer programming problems.
- Write a program in C, test and debug it.
- Enumerate and explain the basic imperative programming statements.
- Explain the concept of an algorithm in relation to a data structure.



## Mode of Study

This course will adopt a blended learning format which essentially consists of online learning modules where a portion of the lecture and reading material will be presented through videos (and or web conferences), text, and other interactive programming formats.

## Assessment

There will be two forms of evaluation: Weekly student activities in form of assignments, Quizzes and CATs and, exam to be taken as per the university academic policy.

The weight for each form of assessment are:

Type of Assessment	Weight
• Continuous Assessment (assignments, Quizes, written CATs)	30%
• Examination	70%
<b>Total</b>	<b>100%</b>

## Reference materials

### i. Text Books

- Zak, D. (2016). An Introduction to Programming with C++ (8th ed.). Boston, MA: Cengage Learning. ISBN: 9781285860114 128586011X.
- Dale, N. (2016). Programming and Problem Solving with C++ : Comprehensive (6th ed.). Sudbury: Jones and Bartlett Publishers, Inc. ISBN: 1284076598.
- Savitch, W. J. (2017). Problem solving with C++ (10th ed.). Upper Saddle River: Pearson Education. ISBN: 0134448286.

### ii. Journals

- *Science of Computer Programming*. ISSN: 0167-6423.
- *Programming and Computer Software*. ISSN: 0361-7688.
- *The Programming Journal*. ISSN: 2473-7321.



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