**MOUNTAINS OF THE MOON UNIVERSITY**

**Faculty of Science, Technology and Innovation (FOSTI)**

**DEPARTMENT OF COMPUTER SCIENCE**



**Course outline**

**2022- 2022**

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| Course Name | **STRUCTURED PROGRAMMING** |
| Course Code | **BCS 1202:** |
| Credit UNIT | **(4CU)** |
| Lecturer  Telephone  E-mail | Andrew Tugume Karitani  +256 782 726787 or 0703- 726787  atandretug8@gmail.com |
| **Course Description** | The course provides a strong base in the principles and practice of structured programming. A high level programming language (e.g. C) is used to explain the principles of programming and provide students with hands on practical skills. Areas covered include program structure, data structures, syntactical and semantic correctness, planning and segmentation in programming as well as working with data files. |
| **Course Objectives** | The course aims to provide students with:  i. Knowledge about the various programming languages  ii. Knowledge and skills in programming concepts  iii. Knowledge in planning and organization of programming projects  iv. Techniques of evaluating syntactic and semantic correctness of a computer program |
| **Learning Outcomes** | Upon completion of the course, the students should be able to:  i. Practice with the various programming languages  ii. Apply knowledge and skills in programming concepts  iii. Plan and organize programming projects  iv. Evaluate syntactic and semantic correctness of a computer program |
| **Instruction Method** | Lectures and Practical |
| **Assessment** | Coursework /continuous assessment (40%),  Final Examination (60%) |

Teaching hours for Topics

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| **Topic** | **Name of Topic** | **Lecture(Hrs)** |
| **i.** | Introduction to programming languages | **4hours** |
| **ii.** | Program structure | **3hours** |
| **iii** | Variables and Operators | **2hours** |
| **iv.** | Conditional statements | **5hours** |
| **v.** | Looping statements | **5hours** |
| **vi.** | Arrays and strings | **5hours** |
| **vii.** | Functions | **3hours** |
| **viii.** | Advanced data types | **3hours** |
| **ix.** | Pointers | **4hours** |
| **x.** | Dynamic memory allocation and dynamic structures | **3hours** |
| **xi.** | Working with files | **3hours** |
| **xii.** | Practical sessions | **20 hours** |
| **Total Hours** |  |  |
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**Course OutLINE**

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| **Lecture 1&2** | | |
| **Date** | **27th /08/2022.** | |
| **Time** | **12:00PM -3:00PM** | |
| **Topic One** | **Introduction to programming languages**   * Definition of Program. * Computer Programming, * Computer Programmer. * Generations of Programming Language * Types of Programming Language. * Problem solving techniques in programming. | |
| **Readings** |  | |
| **Topic Two** | **Introduction to C++ Language**   * Definition * Features * Applications/uses of the Language. * Program development Cycle. | |
| **Lecture 3&4** | | |
| **Date** | **3rdSept 2022** | |
| **Time** | **12:00PM -3:00PM** | |
| **Topic Two** | **Program structure**   * Header File Section * Class Declaration section * Member Function definition section * Main function section | |
| **Readings** |  | |
| **Lecture 5&6** | | |
| **Date** | **10th Sept 2022** | |
| **Time** | **12:00PM -3:00PM** | |
| **Topic Three** | **Variables and Operators**  Variables   * Rules for defining variable name: * Data Types * Declaring Variables * Constants   **Operators**   * Arithmetic Operators * Assignment Operators * Operators Precedence in C++      * **Assignment 1** | |
| **Readings** |  | |
| **Lecture 7&8** | | |
| **Date** | | **17th Sept 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic Four** | | **Conditional Statements**   * If……… else statement * If……….. else if statement * Nested if statement * Switch……….statement |
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| **Lecture 9&10** | | |
| **Date** | | **24th Sept 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic Five** | | Looping statements **4hours**   * for……… loop * while…… loop * do………….while   **Control Statement**   * Break, * continue, * goto |
| **Lecture 11** | | |
| **Date** | | **1st Oct 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic** | |  |
| **Readings** | |  |
| **Lecture 12** | | |
| **Date** | | **8th Oct 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic Six** | | **Arrays and strings 2hours**   * Array definition * Declaration of arrays * Initializing Arrays * Accessing Array Elements |
| **Readings** | |  |
| Lecture 13 | | |
| **Date** | | **15th Oct 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic Six** | | Arrays and strings **2hours**  **Conncepts of arrays in c++**  Types of arrays   * Multidimensional arrays * Pointer to arrays * Passing arrays to functions * Return array from functions   Strings   * Definition of Strings * The string Class in C++ * Creating string objects * Declaration of strings   Operations on strings   * Concatenation * Concatenation of Mixed-Style Strings * The concat-assign Operator += * Comparison Operators for string Objects |
| **Readings** | |  |
| **Lecture 14** | | |
| **Date** | | **22nd Oct 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic** | | **Central Test** |
| **Lecture 15** | | |
| **Date** | | **29th Oct 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic Seven** | | Functions 2hours   * User-defined Function Library Function * Function prototype (declaration) * Passing Arguments to Function |
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| **Date** | | **5th Nov 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic Eight** | | **Advanced data types 2hours**  Arrays.  Strings of Characters  Pointers  Dynamic Memory.  Structures  User defined data types. (typedef, union, enum) |
| **Readings** | |  |
| **Lecture 17** | | |
| **Date** | | **12th Nov 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic Nine** | | **Pointers 4hours**   * Memory addresses * Declaration * Dereferencing a pointer * Pointers to pointer * Static vs. dynamic objects * **Class Activity** |
| **Readings** | |  |
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| **Lecture 18 &2022** | | |
| **Date** | | **19th Nov 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic Ten** | | Dynamic memory allocation and dynamic structures **4hours** Allocating memoryDynamic Memory AllocationAllocating space with newAccessing dynamically created spaceDeallocation of dynamic memoryApplication Example: Dynamically resizing an array |
| **Readings** | |  |
| **Lecture 20** | |  |
| **Date** | | **26th Nov 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic Eleven** | | **Working with files 3hours**   * **Input/output with files** * **Ofstream** * **Ifstream** * **Fstream** * **Opening a file** * **Closing a file** * **Reading and writing to file** |
| **Readings** | |  |
| **Lecture 21** | |  |
| **Date** | | **3rd Dec 2022** |
| **Time** | | **12:00PM -3:00PM** |
| **Topic** | | **Practicaal Session** |
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| **Lecture 22** | | |
| **Date** | | 5/May/2022 |
| **Time** | | **4:00PM-6:00PM 11:00AM -1:00PM** |
| **Topic** | | Practical sessions **4 hours** |
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**Reference:**

1.Object Oriented Programming in C++; Robert Lafore, Third Edition

2..C++ Programming with Object Oriented Approach, Arjun Singh Saud, 1st Edition

### The C++ Programming Language, 4th Edition

3.C++ How to Program; Deitel & Deitel, 5th Edition

**Web sites**

https://www.w3schools.com/cpp/cpp

http://www.cplusplus.com/doc/tutorial

https://www.cppbuzz.com

https://www.javatpoint.com/cpp-strings

https://www.w3schools.in/cplusplus-tutorial

*www*.*learncpp.com*

https://www.geeksforgeeks.org/c-plus-plus

https://beginnersbook.com/2017/08/cpp-switch-case/

https://www.worldbestlearningcenter.com

http://www.cppforschool.com