Rev: July 17, 2022	Course Outline: **CS 116**	Credit Hours: 3-1

Programming Fundamentals

Text Book:

Starting out with Python, 5th Edition, Tony Gaddis.

Reference Books:

1. Starting out with Programming Logic & Degins,5th Edition, Tony Gaddis,
2. The C Programming Language, 2nd Edition by Brian W. Kernighan, Dennis M. Ritchie
3. Object Oriented Programming in C++ by Robert Lafore, 4th Edition
4. Introduction to Computation and Programming Using Python: With Application to Understanding Data, 3rd Edition by Guttag, John
5. Practice of Computing Using Python, 3rd Edition by William Punch & Richard Enbody
6. C How to Program, 7th Edition by Paul Deitel & Harvey Deitel
7. Problem Solving and Program Design in C++, 7th Edition by Jeri R. Hanly & Elliot B. Koffman

Course Description:

Introduction to problem solving, a brief review of Von-Neumann architecture, Introduction to programming, role of compiler and linker, introduction to algorithms, basic data types and variables, input/output constructs, arithmetic, comparison and logical operators, conditional statements and execution flow for conditional statements, repetitive statements and execution flow for repetitive statements, lists and their memory organization, multi dimensional lists, introduction to modular programming, function definition and calling, stack rolling and unrolling, string and string operations, pointers/references, static and dynamic memory allocation, File I/O operations

Course Objectives:

The objective of course is to introduce a disciplined approach to Problem solving methods and algorithm development. The aim is to teach the syntax and vocabulary of a modern programming language like C++

Pre-requisite: **None**

Grading Policy:

Mid Term	30 %
Final Term	70 %

Week-wise Breakdown

Week	Topics / Activities	Chapter
1	Basics of C++ Environment, Basic Program Construction	
2	Header Files and Library Files, Variables and Data Types, Operators (arithmetic, Logical, Increment, Decrement) and their precedence	
3	Type qualifiers and their type conversion, Compound Assignment	
4	Loops & Decisions, If statement, If -else statement, Else-If statement, Switch statement	
5	Conditional operators, for loop, While loop, do-while loop, Break, Continue & Goto statements	
6	Structures and Enumerations, Declaring Structures and their variables	
7	Accessing Structures members, Nested structures, Enumerations	
8	Functions, Parts of Functions, Passing argument to functions, returning values from functions	
	Mid Semester Exam	
9	Function Overloading, Default Argument, Inline functions, Storage Classes, Recursion, Function templates	
10	Arrays, One dimensional and two dimensional array fundamentals,	
11	Passing arrays to functions, Array of structures	
12	Searching and sorting arrays	
13	Fundamentals of characters and strings, string manipulation function	
14	Pointers, Fundamentals of Pointers	
15	Pointers and Arrays, Pointers and Function	
16	Pointers and Strings, Memory Management	
	End Semester Exam	