Course Title	**Programming Fundamentals**
Course Code	**CC-112**
Credit Hours	3
Category	Computing core
Prerequisite	None
Co-Requisite	None
Follow-up	CC-211: Object Oriented Programming, DI-322: Web Technologies
Course Description	**Introduction**: Problem solving, Von-Neumann architecture, programming, compiler, linker, algorithms, Flowcharts/Pseudo Codes. **Basic C++ Language Constructs:** Data types, Variable and Constants, Operator and Expressions, Input and Output (I/O), Formatted I/O, arithmetic, comparison and logical operators. **Conditional Statements:** execution flow for conditional statements, if control structure, multiple selection using switch and logical operators. **Repetitive Statements**: execution flow for repetitive statements, Repetition using for and do while. **Procedural Programming in C Language:** functions, prototype, parameter and arguments, call by value and call by reference, stack rolling and unrolling, library and header files, scope and lifetime of variables (storage classes). **Lists:** memory organization of lists, multi-dimensional lists. **Composite data types arrays:** definition, processing, and passing of array to a function, multi-dimensional arrays. Searching and sorting. **Pointers:** pointer definition, pointer arithmetic, constant pointers, pointer and arrays. **Strings:** string and characters, string and string operations, static and dynamic memory allocation. **User Defined Data Types:** structures, definition, initialization, accessing members of structures, typedef, union, enumerations. **C File Processing:** files and streams, Sequential Access File, File I/O operations, Random Access File, Secondary Storage I/O. **Command Line Arguments.**
Text Book(s)	1. Tony Gaddis, Starting out with C++: from control structures through objects, 7th Ed., Addison-Wesley, 2012, ISBN 978-0-13-257625-3
Reference Material	1. D.S. Malik, C++ Programming, From Problem Analysis to Program Design, 5th Ed., Course Technology, 2011, ISBN: 978-0-538-79813-6 2. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, 2nd Ed., Prentice Hall, 1988, ISBN: 978-0131103627. 3. Bjarne Stroustrup, The C++ Programming Language, 4th Edition, Addison-Wesley, 2013, ISBN 978-0321563842. 4. References from different books, some web-links or lecture notes for reading will be provided.