|  |
| --- |
| Mehran University of Engineering and Technology, Jamshoro |
| *FRM-003/00/QSP-004*  *Dec, 01, 2001* |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tentative Teaching Plan | | | | | |
| Department of Software Engineering | | | | | |
| Name of Teacher | Dr. Naeem Ahmed Mahoto | | | | |
| Course Name | Programming Fundamentals | | **Course Code** | SW112 | |
| Batch | 23-SW | **Year** | **1st** | **Semester** | 1st |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| # | Topic | | Learning Outcome | Delivery Method | Lecture Hours |
| 1 | Programming Fundamentals | | Introduction to Computer Programming  History and generations of Computer programming languages  Interpreted and Compiled languages  Data and Information. | Lecture | 3 |
| Introduction to C/ C++ programming languages, Features of C++,  Introduction to a typical C++ IDE  (Dev CPP / MS Visual C++) Environment,  Compiling and execution of C++ program.  Source code and Object code,  Language Translators | Lecture & Discussion | 2 |
| 2 | | C++ programming | Basic C++ Program Structure. Programming style (syntax),  statement terminator and comments.  C++ Primitive data types, such as int, char, float etc.  Variables and Constants  Variable declaration, definition and initialization. Variable names / Identifiers. Assignment statements and keywords.  Types of variables: automatic/local, static, external/global. | Lecture, Discussion & Tasks | 3 |
| Output with cout : single character and other data types. Input with cin: Single character, word and multiword.  Format Specifiers, Field Width Specifiers, Escape Sequences.  Manipulators: endl, setw etc. |  | 2 |
| Type Conversions: Automatic  Conversions. Casting: Implicit and  Explicit casting.  To understand Header files and Library files  Directives : Preprocessor, define and using Directives. | Lecture, Discussion & Tasks | 2 |
| 3 | Operators | | Working with various operators such as Address operator (&), Arithmetic Operators, Arithmetic Assignment operator, Special assignment operators, Relational Operators, Increment and Decrement Operator  To understand operator precedence.  Working different types of expressions (assignment, Boolean etc). | Lecture & Tasks | 2 |
| 4 | Control Structures( Decision making statements) | | To know how to compare the given data values. The if statement, The if-else statement, The else-if construct, Switch statement, goto statement, Conditional operator.  Relational and logical operators ( AND, OR, and NOT operators) | Lecture, Discussion & Tasks | 3 |
| 5 | iterative statements (Loops) | | For loop, nested for loop, the while loop, the do while loop, Continue & break statement. | Lecture & Tasks | 3 |
| 6 | Functions | | Introduction to Functions, Function declaration/ prototype, definition and call.  Difference between pre- defined/ standard function and user defined function. Passing arguments to functions. Passing variables as arguments.  Returning values from Functions, the return statement.  Reference Arguments: Pass variable by reference. Use of external variable. | Lecture & Discussion | 3 |
|  | | Overloaded Functions. Using more than one function, Inline Functions. |  | 1 |
| 7 | Arrays | | Define an Array, Initializing an array.  Accessing individual elements.  Passing arrays to function as arguments.  Searching and sorting.  Array of characters  Multidimensional arrays. | Lecture & Tasks | 3 |
| 8 | Strings | | C++ String class and built-in methods of String class and their use for string manipulation, null character.  String library functions. | Lecture & Discussion | 2 |
| 9 | User Defined Data Types (Structures and Enumeration) | | Declaring, Defining and initializing structure.  Accessing structure members  Passing structures as function arguments  Nested structures, Arrays of structures, Linked Lists, Routines | Lecture & Discussion | 2 |
| 10 | Union | | unions, Union of structures,  Bit wise operator. | Lecture & Discussion | 2 |
| 11 | Pointers | | Pointer variable, Returning multiple values from functions, Pointers and arrays, Pointers arithmetic, Pointers and strings, Double indirection: Pointers to pointers. | Lecture & Discussion | 2 |
| 12 | Introduction to Object Oriented Programming | | Objects and Classes, Member Functions and Data.  Access Specifiers: Private and Public, Objects and the Real World (an Analogy).  Constructors and Destructors. | Lecture & Discussion | 2 |
| 13 | Inheritance and Polymorphism | | Implementing the concepts of inheritance and Polymorphism Programmatically | Lecture & Tasks | 3 |
| 14 | Operator overloading | | The operator Keyword, Overloading Unary Operators, Overloading Binary Operators, Constructors as Conversion Routines, Converting between BASIC & user Defined Types, Thoughts on Overloading | Lecture & Tasks | 2 |
| 15 | I/O Fundamentals | | Standard file I/O, Character, string and formatted I/O, Block I/O, Binary and Text file modes, System level I/O, Random access, & redirection. | Lecture & Tasks | 3 |
| 16 | Basic Graphic Programming in C++ | | Introduction to Graphics in C++. Writing graphics programs with [graphics.h](https://web.stanford.edu/class/archive/cs/cs106b/cs106b.1126/materials/cppdoc/graphics-h.html). creating basic shapes like circle, rectangle, line, ellipse, and display text. | Lecture & Tasks | 2 |

|  |  |  |
| --- | --- | --- |
| Signature | | |
| *Signature of Teacher* |  | *Dated*: |
| *Remarks of DMRC* |  | *Dated*: |
| *Signature of Chairman* |  | *Dated*: |