**Syllabus on**

**C programming**

**National Academy for Computer Training And Research (NACTAR)**

**Bogra**

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| **Sl.** | **Covered Areas** | **Hours** |
| 1 | * **Computer Fundamentals**
* **Concept of Hardware**

 Basic Components & Units of a computer* **Concept of Software**

 **System Software**: Introduction to Operating System (OS). **Application Software:** Concept of real world application software & customize software.* **Computer Networks Basic Concept:**

Classification of Network & Topology | 3 hours |
| 2 | * **Generations and Levels of Programming Languages**
* **IDE(Turbo C, Dev C, Code block)**
* **C Language – Overview**
 | 3 hours |
| 3 | C - Environment SetupLocal Environment SetupCompiler & InterpreterC - Program Structure* Input-Output Statement

Hello World ExampleCorresponding Lab Session | 3x2=6 hours |
| 4 | Compile and Execute C ProgramTokens in CSemicolonsCommentsIdentifiersKeywordsWhitespace in CCorresponding Lab Session | 3 hours |
| 5 | C - Data TypesTypes & Description* **Basic Types:**

They are arithmetic types and are further classified into: (a) integer types and (b) floating-point types.* **Enumerated types**

They are again arithmetic types and they are used to define variables that can only assign certain discrete integer values throughout the program.* **The type void**

The type specifier *void* indicates that no value is available.* **Derived types**

They include (a) Pointer types, (b) Array types, (c) Structure types, (d) Union types and (e) Function types.Corresponding Lab Session | 3 hours |
| 6 | C – Variables:Variable Definition in CVariable Declaration in CC - Constants & Literals:Integer LiteralsFloating-point LiteralsCharacter ConstantsString LiteralsDefining ConstantsCorresponding Lab Session | 3x2=6 hours |
| 7 | * **C – Operators**

Arithmetic OperatorsRelational OperatorsLogical OperatorsBitwise OperatorsAssignment OperatorsMisc Operators ↦ sizeof & ternaryOperators Precedence in C* **C - Decision Making:**  The **? :** Operator

Corresponding Lab Session |  3x4=12 hours |
| 8 | * **Step of Programming**
* **Flowchart & Algorithm (Searching & Sorting)**
* **Basic concept of data structure: Array, Stack, Queue, Linked list**
 | 3 hours |
| 9 | * **Control Statements and Loops**
* If statement
* if else statement
* else if statement
* Nested if else statement
* Switch Statement
* Break Statement
* Continue Statement
* Comma Operator and goto Statement
* For loop, while Loop, do-while Loop
* Nested Loops

Corresponding Lab Session | 3x6=18 hours |
| 10 | * **C – Functions**

Defining a FunctionFunction DeclarationsCalling a FunctionFunction Arguments* User Define vs Library Function

Corresponding Lab Session | 3x2=6 hours |
| 11 | * **C - Scope Rules**

Local VariablesGlobal VariablesFormal ParametersInitializing Local and Global VariablesCorresponding Lab Session | 3 hours |
| 12 | * **C – Arrays**

Declaring ArraysInitializing ArraysAccessing Array ElementsArrays in Detail: 1D & Multi-DimensionalCorresponding Lab Session | 3x3=9 hours |
| 13 | * **C – Pointers**

What are Pointers?How to Use Pointers?NULL PointersPointers in DetailCorresponding Lab Session | 3 hours |
| 14 | * **C – Strings**
* String Functions and Examples
* Basic Operations on String

Corresponding Lab Session | 3 hours |
| 15 | * **C - Structures**

Defining a StructureAccessing Structure MembersStructures as Function ArgumentsPointers to Structures* **C - Unions**

Defining a Union & Accessing Union MembersCorresponding Lab Session | 3x2=6 hours |
| 16 | * **C - File Operation**

Opening Files, Closing a File, Writing a File, Writing a FileCorresponding Lab Session | 3 hours |
| 17 | * **C - Recursion**

Number FactorialFibonacci Series* **C - Variable Arguments**

Corresponding Lab Session | 3 hours |
| 18 | * **Graphics Programming in C**

Corresponding Lab Session | 3 hours |
| 19 | * **Real life project using C:**
	+ - 1. **Calculator Design**
			2. **Contact Management System**
			3. **Bus Reservation System**
			4. **Student Record System**
			5. **Tic-Tac-Toe**
 | 3x5=15 hours |
| 20 | * **Evaluation( Theory+ Lab Test), Project Presentation & Submission**
 | 3x3=9 hours |
|  | **Total**  | 120 hours |
| Prepared By:1.Istiaque Ahmed, Lecturer in CSE,Pundra University of Science & Technology(PUB)2.Md.Minhazur Rahman, CSE,DUET3.Md.Abdul Alim, Instructor,NACTAR 4.Md.Khondokar Mahmudul Islam,Assistant Instructor (Computer),NACTAR 5.Md.Abu Bakar Shiddiq, Assistant Instructor(Research),NACTAR**Syllabus on** **C programming For HSC-ICT** **National Academy for Computer Training And Research (NACTAR)****Bogra.**Syllabus on C programmingFor HSC-ICT **Number of days: 25 (working day)****Class Time: 03 hours daily.****Total hours: 75 Hours.**

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| **Sl** | **Topic** | **Hour(s)** |
| **C PROGRAMMING LANGUAGE** |
| **01** | **Introduction** * + Concept of C Programming.
	+ Structure of C Program,
	+ IDE: Turbo C, Dev C , Code block;
	+ String, C token,
	+ Character set,
	+ Identifiers and Keywords,
	+ Data Types,
	+ Constants, Variables and Array,
	+ Variable Declarations,
	+ Statements,
	+ C programming style
	+ Compiler and Program Design
	+ Preprocessor directive.
	+ Header file.
 | **09 hours** |
| **02** | **Formatted Output Statement & Operators & Expressions**. * Output Statement: printf()
* Assignment Operator
* Arithmetic Operators
* Relational Operators
* Logical Operators
* Conditional Operators
* Comma Operator,
* Increment & Decrement Operator
* Precedence of Operators
* Precedence of Logical Operators
* **Lab Session:** Write a simple C program using Output statements.
 | **18 hours** |

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| **03** | **Formatted Input Statement** * + Structure of C Program,
	+ Input Statement: scanf()
	+ Expressions.
	+ **Lab Session:** Write a simple C programs using Input-Output Statements.
 | **03 hours** |
| **04** | **Control Statements** * + If statement
	+ Flowchart & Algorithm
	+ If else statement,
	+ Flowchart for if else
	+ else if statement
	+ Flowchart for else if
	+ switch Statement,
	+ Flowchart for switch statement
	+ Break Statement,
	+ **Lab Session:** Write a simple program using Control statements.

  **Real Life Project:** Simple Calculator Design**.** | **12 hours** |
| **05** | **Looping Statement*** + For statement
	+ Flowchart for (for looping statement)
	+ While statement,
	+ Flowchart for (while looping statement)
	+ Do-While statement,
	+ Flowchart for (do while looping statement)
	+ Nested Loops.
	+ goto statement
	+ continue statement
	+ **Lab Session:** Write a simple program using looping statements.
 | **15 hours** |
| **06** |  **Array** * + Defining an Array,
	+ Processing an Array,
	+ Passing Array to a Function,
	+ Multidimensional Arrays.
	+ **Lab Session:** Write a simple program using array.
 | **09 hours** |

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| **07** | **Function*** + A Brief Overview of function,
	+ Defining and declaring a Function,
	+ Accessing a Function,
	+ Passing Arguments to a Function,
	+ Specifying Argument,
	+ Data Types,
	+ Function prototypes,
	+ Recursive Function. Macro.
	+ **Lab Session:** Write a simple program using functions and Evaluation.
	+ **Real Life Project**: Calculator Design using function
 | **09 hours** |
|  | **Total** | **75 hours** |

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