	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM

Programme	**Bachelor of Technology in Mechanical Engineering**	Year of Regulation	**2018**
Department	**Mechanical Engineering**	Semester	**II**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
CS 102	**Introduction to Computing**	**2**	**1**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives		Course Outcomes		
	To introduce the basic architecture of a computer, the concept of algorithm, the basic concepts and terminology of programming in general and concept of functional hierarchical code organization.		CO1	Able to explain the basic architecture of a computer, the concept of algorithm, and the basic concepts and terminology of programming in general.
	To inculcate the ability to do algorithmic thinking to analyse real-world problems and develop algorithms to solve those.		CO2	Able to develop the ability to do algorithmic thinking to analyse a problem and develop an algorithm to solve it.
			CO3	Able to use the C programming language to implement various algorithms.
	To introduce programming using C language and writing programs in C on a computer, and edit, compile, debug, correct, recompile and run those.		CO4	Able to choose the right data representation formats based on the requirements of the problem.
			CO5	Able to write programs on a computer, edit, compile, debug, correct, recompile and run those.
	To train the students in choosing right data representation formats based on a problem specification.		CO6	Able to understand the concept of functional hierarchical code organization.

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	**3**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**
2	CO2	**2**	**3**	**3**	**2**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**0**
3	CO3	**3**	**3**	**3**	**2**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**3**	**0**
4	CO4	**3**	**1**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
5	CO5	**3**	**0**	**3**	**1**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**
6	CO6	**3**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**

SYLLABUS

No.	Content	Hours	COs
I	**Introduction** • Organization of a Computer: Von Neumann architecture; CPU; Memory; RAM; ROM; Hardware; Software; Application Programs; System Programs; Operating Systems; Number Systems. • Concept of Programming and Programming Languages: Machine Language; Assembly Language; High-Level Programming language; Compiler; Assembler; Interpreter; Linker; Loader; Compiling a C program in command line and in an IDE • Concept of Algorithm, Flowchart, Pseudo code, Illustrative Problem Solving Examples.	**07**	**CO1** **CO2**
II	**Introduction to C programming language** • Features of a Programming Language: Character Set; Constants; Escape Sequences; Identifiers; Keywords; Data Types; Data Type Qualifiers; Variables; Declarations; enum; typedef; Operators & Expressions - Binary operators :- Arithmetic Operators, Logical Operators, Relational Operators, Bitwise Operators; Assignment Operator; Shorthand Assignment Operators; Unary Operators; Ternary Operators; Special Operators; sizeof(); Operator Precedence and Associativity in expressions; Data type conversion: coercion (implicit type conversion), type casting (explicit type conversion); Statements: Assignment statements, Input/ Output statements for standard input/ output devices. **Flow Control -** Conditionals and Branching :- Simple if Statement, if-else Statement, Nested if-else Statement, Ladder structure of if-else, switch-case statement, goto statement; **Iteration -** while Statement, do-while Statement, for Statement, break and continue. **Functions; Function Types -** standard library functions, user defined functions; syntax of functions; Arguments and Parameters; Call by Value; Call by Reference; parameterized main function; Storage Classes - auto, register, static, extern; Scope Rule: Variable scope - local, global; Recursion. **Arrays -** Single Dimensional Arrays, Multi-Dimensional Arrays, Introduction to strings :- Definition of a string, character arrays and strings, pointers and strings, standard library string functions, arrays of strings; Pointers - different types of pointers, pointer arithmetic, pointers and arrays. **Structures -** creating structures using struct, Arrays in Structures, Array of Structures, Difference between arrays and structures; Unions - creating structures using union, difference between structures and unions. **Preprocessor directives and Files -** Preprocessor directives :- File inclusion by macro, macros, macros and functions; Basic Input/ Output operations on Files :- Text files and binary files, file opening modes, opening, closing, reading,writing and appending to a file. **(A programming language like C/ C++ shall be used as a basis language. The same language is to be used for the laboratory).**	**29**	**CO3** **CO4** **CO5** **CO6**
	Total Hours	**36**	

Essential Readings

1. E. Balagurusamy, “Programming in ANSI C”, McGraw-Hill Education, 6th edition, 2019.

2. V. Rajaraman, “Fundamentals of Computers”, PHI Learning, 6th revised edition, 2014.
3. Yashavant Kanetkar, “Let Us C”, BPB Publications, 16th edition, 2017.
Supplementary Readings
1. Byron S. Gottfried, “Programming with C”, McGraw-Hill Education, 4th edition, 2018.
2. Brian W. Kernighan, Dennis M. Ritchie, “The C Programming Language: ANSI C Version”, Pearson Education India, 2nd edition, 2015.
3. Darrel L. Graham, “C Programming Language”, Createspace Independent Publishing, 1st edition, 2016.