GUJARAT TECHNOLOGICAL UNIVERSITY

Integrated M.Sc. (Information Technology)
Semester: I
Subject Name: Fundamentals of Computer and Basics of Programming
Subject Code: 1310503

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Teaching Hours	Module Weightage (%)
1.	**Introduction to computer:** Introduction, Basic block diagram and functions of various components of computer, Concept of Hardware and Software, Types of software, Compiler and Interpreter	04	06
2.	**Introduction to Programming:** Basic Difference between Procedure Oriented Language and Object-Oriented Language, Concepts of Machine level, Assembly level and High-level programming, Flow charts and Algorithms	04	06
3.	**Fundamentals and basics of 'C':** Features of C language, structure of C program, comments, header files, data types, constants and variables, operators, expressions, evaluation of expressions, type conversion, precedence and associativity, I/O functions.	05	11
4.	**Control Structures in 'C'**: Simple statements, Decision making statements, Looping statements, Nesting of control structures, break and continue statement, unconditional go to statement.	05	12
5.	**Array & Concepts of String:** Concept of array, One and Two dimensional arrays, declaration and initialization of arrays, String, String storage, Built-in string functions	06	13
6.	**Functions**: Concept of user-defined functions, prototype, definition of a function, parameters, parameter passing, calling a function, recursive function Macros.	05	13
7.	**Pointers:** Basics of pointers, pointer to pointer, pointer and array, pointer to array, array of pointers, function returning a pointer	05	10

8.	**Structure and Union**: Basics of structure, structure members, accessing structure members, nested structures, array of structures, structure and functions, structures and pointers, unions, bit-fields	05	10
9	**The Pre-processor**: Introduction, Macro substitution, File Inclusion, Compiler Control Directives	02	05
10	**File Management**: Introduction to file management, Simple file management functions for text files, reading from and writing to files.	03	09
11	**Concepts of Object-Oriented Programming:** Fundamentals, Features like class, object, polymorphism, inheritance, data encapsulation and abstraction.	02	05

Reference Books:

1. Let us C, Yashwant Kanitkar
2. Programming in ANCI C, Seventh edition, by Balagarusamy E, TataMcGraw-Hill PublishingCompany Limited
3. Fundamentals of Computing and Programming in C, First Edition, Oxford UniversityPress, 2009 by Pradip Dey, Manas Ghosh

Course Outcomes:

After learning the course, the students should be able to:

1. Learn fundamental knowledge of computer hardware and number systems
2. Learn basic terminology used in computer programming
3. Develop an ability to write, compile and debug programs in C language
4. Design programs involving decision structures, loops and functions
5. Understand the dynamics of memory by the use of pointers, structures and unions
6. Learn the basic concepts of the object-oriented programming paradigm