Swami Ramanand Teerth Marathwada University, Nanded

B.Sc First Year Semester Pattern Computer Science (Optional)
With Effect from 2009-10

Aims and Objectives:

1. To provide a professional level of competence in the most common languages, systems, methods and tools.
2. To provide a sound understanding of principles of Computer Science.
3. To a strong sense of professionalism in students.
4. To reflect the current and emerging trends in the computing fields.

Academic Programme:

The programme is of three years duration (Six Semester), B.Sc.- I Sem, B.Sc.II Sem, B.ScIII Sem ,B.Sc. IV Sem , B.Sc. V Sem and B.Sc.-VI Sem
The scheme of instructions and examination of theory and practical papers is as follows.

B.Sc. I Year. Computer Science (Optional)

Paper No.	Paper Title	Teaching Periods Per Week (Theory/ Practical)	Marks (University Evaluation)	Marks (Internal Evaluation)	Total Marks	Total Periods	Duration of Examination
Semester-I							
I	Fundamentals of Computer	03 Periods Theory	50	10	60	40	03 Hours
II	Computer Algorithm	03 Periods Theory	50	10	60	40	03 Hours
Semester –II							
III	Programming in C	03 Theory Periods	50	10	60	40	03 Hours
IV	Data Structures	03 Periods Theory	50	10	60	40	03 Hours
V (Annual Practical I Sem + II Sem)	Computer Lab-I	01 Practical (03 Periods)	60	------	60	20 Minimum Practicals	03 Hours
				Total Marks	300		

Paper –I : Fundamentals of Computer
Marks : 50
Periods : 40

1. **Introduction to Computer System** (6 periods)
History of Computer, Generations, Block diagram of computer, Characteristics of computer, Classification and Types of computer.
2. **Data Representation within Computer** (6 periods)

Bit, Byte, Word, ASCII, EBCDIC, BCD code,
Introduction to Number system: Binary, Decimal, Octal, Hexadecimal. Conversions from one Number system to another.

3. **Memory** (5 periods)
Memory Cell, RAM, ROM, EPROM, Floppy Disk, Hard Disk, CD-ROM, DVD.

4. **Input and Output Devices** (7 periods)
Keyboard Entry,
Direct Entry: Card Reader, OCR, OMR, MICR, Pointing Devices: Light Pen, Mouse, Touch Screen. Monitor. Printers: Dot-Matrix, Inkjet, Laser.

5. **Disk Operating System** (8 periods)
DOS Preliminaries, Files, Directory, Wild Character, Booting Procedure, Internal DOS Commands, External DOS Commands.

6. **Introduction to Windows Operating System** (8 periods)

Windows Operating system History, Files, Folders, Architecture of Windows O.S., Desktop, My Computer, Recycle bin, Control Panel, Features of Windows (GUI, Multasking, Multi-user)

Reference Books:
1. Fundamentals of Computer by V.Rajaraman, BPB Publication
2. Computers and Commonsense by Robert Hunt and Shelly,BPB Publication.
3. Fundamentals of Computer by Bichkar and Sontakke, Sadhusudha Publication
4. MS-DOS 6.22 by Russell A, Stultz, BPB Publication.
5. Advanced MS-DOS Programming by Ray Duncan, BPB Publication
6. Teach Your Self Windows 2000 by Brain Underdahl
7. Windows 98 Complete, BPB Publication.

Paper - II : Computer Algorithms
Marks : 50
Periods : 40

1. **Introduction to Problem Solving** (8 periods)
Problem Aspects, Top-Down design, implementations of algorithm, program verification, efficiency of algorithms, analysis of algorithms.

2. **Fundamental of Algorithms** (8 periods)
Algorithm for exchanging the value of two variables, counting, summation of set of numbers, factorial computations, generation of Fibonacci series, reversing digits of and integers, Character to number conversion.

3. **Factoring Methods** (8 periods)
Finding square root of numbers, smallest divisor of an integer, GCD of two integers, generating prime numbers, computing prime factors of integers

4. **Array Techniques** (8 periods)
Introduction to array, memory representation of array, algorithm for array order Reversal, array counting, finding maximum and minimum element from array.

5. **Flowchart** (8 periods)
Definition and properties, Principles of flowchart, Flowchart Symbols, Converting algorithm to flowchart.

Reference Books:
1. How to Solve It by Computer, by R.G. Drommy (PHI Ltd)
2. Fundamentals of Computer by V. Rajaraman, BPB Publications
3. Ansi C by E. Balguruswamy, PBP Publication

B.Sc. First Year
Semester Pattern Computer Science
(Optional)
Second Semester

Paper- III : Programming in C
Marks : 50
Periods : 40

1. **Introduction to C** (5 periods)
Introduction, Character set, Identifiers, Keyword, Data types, Constant, Variables, Input/Output Statement, operators, Hierarchy of Operation, Structure of C program.

2. **The Decision and Looping, Control Structure** (8 periods)

If Statement, If-Else statement, Nesting of If-Else, Switch Statement, Goto.
While loop, Do-While loop, For loop.

3. **Arrays** (5 periods)
Introduction to Array, Types of array, Array initialization in memory, bound Checking.

4. **Storage Classes** (4 periods)
Automatic, Register, Static, Scope rules.

5. **Functions** (7 periods)
Introduction, Advantages, arguments and local variables, returning function results, Declaration of function types, passing values between function, recursion.

6. **Character String** (4 periods)
What are string, Standard Library string functions: strlen(), strcpy(),strcmp(), strcat().

7. **Introduction to Pointers ,Structure and Union** (7 periods)

Reference Books:
1. Let US C by Yeshwant Kanetkar, BPB Publication.
2. Programming in ANSI C by E. Balaguruswamy, TATA MCGRAW Hill Publication.
3. Programming in ANSI and Turbo C by Prof. Kamthane, Pearson Education.

Paper-IV : Data Structures
Marks : 50
Periods : 40

1. **Introductions and Overviews** (8 periods)
Introduction, Elementary Data Organization, Data Structure Operation, Notation and Concept of Algorithm.

2. **Array, Records and Pointers** (8 periods)
Introduction, Linear array, representation of Linear Array in Memory, Traversing Linear Array, Inserting and Deleting.

3. **Sorting and Searching Methods** (8 periods)
Sorting Methods: Bubble Sort, Insertion Sort, Quick Sort, and Selection Sort.
Searching Methods: Binary Search, Linear Search.

4. **Linked List** (8 periods)
Introduction, Representation Linked list in memory, searching a linked list, Inserting and deleting linked list.

5. **Stack, Queue and Recursion** (8 periods)
Introduction to Stack, Array representation of stack, Push and Pop operation.
Introduction to Queue, Array representation of queue, Insert and Delete operation, Recursion.

Reference Books:
1. Data Structure by Seymour Lipschutz, Schaums ouline series in Computers, McRaw Hill.
2. An Introduction to Data Structure with Application by Jean-Paul, Tremblay-Paul, G. Sarenson, Tata McGraw Hill.

Paper V : Computer LAB.
Marks : 60

Practical contains Aim of Experiment, Description, Result, and Record Book (60 Marks =50 marks for Experiment and 10 Marks for Record Book)
(Practical based on DOS, Windows and programming in C Language and Data Structure)

1. Introduction to various components of computer system and study of various Input and Output devices.
2. Study of Booting procedure of DOS.
3. Study about CONFIG.SYS and AUTOEXEC.BAT files.
4. Study of Internal and External Commands.
5. Study of components of Windows operating system.
6. Study of Windows Accessories.
7. Study about the Ms-Word (File Menus, Document creation, Text formatting).
8. Writing programs in C for small problem mainly computational to illustrates expression and operator precedence.
9. Writing some simple programs like finding factorial of numbers, summation of set of numbers, computation of prime numbers, prime factors etc.
10. Problem related to Array like Print reverse order of array, sum of array element, sorting of array, finding maximum and minimum element from array.
11. Problem which involve manipulation of two dimensional arrays like addition, subtraction, multiplication of arrays.
12. Problem which involve manipulate arguments to main().
13. General String manipulation problem.
14. Problem based on Standard string Library functions.
15. Problem based on Storage classes.
16. Searching and Sorting Algorithm is implement in C Language