Swami Ramanand Teerth Marathwada University, Nanded
Syllabus
B. Sc. second Year
COMPUTER SCIENCE
Semester System (MCQ Pattern)

(To Be Implemented From Academic Year 2014-2015)

Theory/ Practical	Semester/ Annual	Semester No.	Paper No.	Title of the Paper	Marks						Min. Lectures / Week
					MCQ	Internal	Experiment	Oral	Record Book	Total	
Theory	Semester	III	VI	Digital Electronics & 8085 Microprocessor	40	10	-	-	-	50	03
			VII	Object Oriented Programming using C++	40	10	-	-	-	50	03
		IV	VIII	ALP using 8086 Microprocessor	40	10	-	-	-	50	03
			IX	Programming in Java	40	10	-	-	-	50	03
Practical	Annual	-	X	**Computer Lab-2** (Annual Practical based on Paper No VI & VIII	-	-	30	10	10	50	03
			XI	**Computer Lab-3** (Annual Practical based on Paper No VII & IX	-	-	30	10	10	50	03
					160	40	60	20	20	300	

Total Marks for Theory = 50+50+50+50 = 200	Total Lectures / Week /Division for Theory = **06**
Total Marks for Practical =50+50= **100**	Total Lectures / Week / Batch for Practical = **06**
Total Marks for SY = 200+100 = **300**	Minimum Lectures / Week for SY = **12**
Computer Lab-2 (Annual Practical based on Paper No VI & VIII	**Computer Lab-3** (Annual Practical based on Paper No VII & IX

Paper No: VI

Digital Electronics & 8085 Microprocessor

(Theory)

1. Fundamental Concepts

Introduction, Digital Signal, Basic Digital Circuits, NAND & NOR Operations, EX-OR & EX-NOR Operations, De-Morgan's theorems, Rules & Laws of Boolean Algebra

2. Combinational Logic Design

Introduction, K-map representation of logical function, simplification of logical function using K-map, minimization of logical functions specified in minterm/maxterm of truth table, use of Don't care condition

3. Flip Flop

A 1-Bit Memory Cell, RS Flip-Flop, D type Flip-Flop, T-type Flip-Flop J-K Flip-Flop, J-K Master Slave Flip-Flop.

4. Sequential Logic Design

Introduction, Registers, shift registers, Ripple/ Asynchronous counter, Synchronous counter

5. Fundamentals of Microprocessor

Introduction, an ideal microprocessor, data bus, address bus, control bus, microprocessor operation, microprocessor architecture, instruction set

6. 8085 Microprocessor

Introduction, Architecture of 8085 microprocessor, pin diagram of 8085 microprocessor

Ref. Books:

1. Modern Digital Electronics- R. P. Jain, Tata McGraw Hill Pub. Company (Third Edition)

2. Digital Principles and Applications- A. P. Malvino, McGraw Hill International Editions (Fourth Edition)

3. Digital Electronics with Practical Approach First Edition - G. N. Shinde, Shivani Pub., Nanded

4. Microprocessor 8085 by B. Ram

5. 8086/8088 Family Architecture, Programming and Design – Yu-Cheng Liu and Gelenn A Gibson Pearson Prentice Hall

6. Microprocessor Architecture Programming & Application- Ramesh Gaonkar, Willey Estern.

7. Digital Electronics: An Introduction to Theory and Practice-William H. Gothmann, Prentice Hall of India.

Object Oriented Programming using C++

(Theory)

1. Principles of Object Oriented Programming
   A look at Procedure Oriented Programming, Object oriented Programming paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP

2. Basics of C++
   What is C++, Tokens, Data Types in C++, Operators in C++: Scope Resolution, Member dereferencing Operators, Memory management Operators, Manipulators, A simple C++ Program, More C++ statements , structure of C++ program, , Control structures

3. Functions in C++
   Introduction, Function Prototyping, Call by reference & return by reference, Function with Default arguments, Inline function, Function Overloading, Mathematical Library functions

4. Classes & Objects
   Introduction, Specifying a class, Defining member functions, a C++ program with class, nesting of member functions, Memory allocation for objects, static data members, static member functions, objects as function arguments, friend functions

5. Constructors & Destructors
   Constructors, Parameterized Constructors, Copy Constructor, Multiple Constructors in a class, constructors with default argument, Dynamic constructors, Dynamic Constructors, Destructors

6. Operator Overloading
   Defining Operator Overloading, Unary and Binary Operator Overloading, Overloading Binary Operators using Friend, Manipulation on String Using Operator, Rules for overloading Operator

7. Inheritance
   Defining Derived Class, Type of Inheritance (Single, Multiple, Multilevel, Hierarchical, Hybrid Inheritance), Virtual base class, Abstract class

8. Working with Files
   Introduction, Classes for file stream Operations, Opening & Closing a file, Detecting end of file, File modes in Open()

   Reference Books:-
   1. Object-Oriented Programming with C++ -E-Balgurusamy
   2. The C++ Complete Reference -TMH Publication
   3. Let us C++ -Yashwant kanetkar

Paper No: VIII :
ALP using 8086 Microprocessor
(Theory)

1. Software Architecture of 8086 Microprocessor

   Microarchitecture of 8086 microprocessor, Software model of 8086 microprocessor, Memory address space & Data Organization, Data types

   Segment Registers & Memory segmentation, dedicated reserved & general use memory instruction Pointer, Data Register, Pointer & Index Register, Status Registers, Generating a memory address, stack, I/P & O/P address space

2. Assembly Language Programming

   Software, Assembly Language Program Development on PC: Describing the problem, planning the solution, coding the solution with assembly language, creating source program, assembling the source program into an object module, producing a run module, verifying a solution, programs & files involved in the program development life cycle Instruction set, the mov instruction, Addressing mode

3. 8086 programming instructions & computation

   Data transfer instructions- MOV, XCHG, XLAT, LEA, LDS, and LES Instruction,

   Arithmetic Instructions- ADD, ADC, INC, AAA, DAA,

   Subtraction Instruction- SUB, SBB, DEC, AAS, DAS, NEG,

   Multiplication & Division Instruction – IMUL, IDIV, AAM, AAD, CBW, and CND

4. More 8086 Instructions

   Logic Instructions- AND, OR, XOR & NOT instructions, Clearing, setting & toggling bits of an operand,

   Shift Instructions- SHL, SHR, SAL, SAR INSTRUCTIONS, ISOLATING value of a bit in an operand,

   Rotate Instruction- ROL, ROR, RCL, & RCR Instructions, Alignment of data in an operand

5. Control Flow Instructions

   Flag control instructions, compare instructions, control flow & jump instructions, Unconditional & Conditional Jump- Unconditional Jump Instruction, Conditional Jump Instruction,

   Branch Program structure- if then else,

   Loop Program Structure – repeat until & while do

6. Subroutine & Loop Instruction

   Subroutines & subroutine handling instructions- CALL & RET Instruction, PUSH & POP Instruction, Loops & loop handling instructions,

   Strings & strings handling Instructions-

   Move String- MOVSB, MOVSW,

   Compare string & scan string- CMPSB/ CMPSW, SCASB/SCASW,

   Load & store string - LODSB/LODSW & STOSB/STOSW,

   Repeat string- REP, auto indexing for string instructions

Ref. Books :

1. The 8086 and 8088 Microprocessors by Walter A. triebel & Avtar Singh 4th edition Pearson Education
2. 8086/8088 Family Architecture, Programming and Design – Yu-Cheng Liu andGelenn A Gibson Pearson Prentice Hall
3. Microprocessor Architecture Programming & Application- Ramesh Gaonkar, Willey Estern.
4. Digital Electronics: An Introduction to Theory and Practice-William H.Gothmann, Prentice Hall of India.

Paper No: IX :

Programming in Java

(Theory)

1. Java Evolution.

Java History, Java Features, How java differs From C and C++, Java and Internet. Java & WWW, Web Browsers, Java support systems, Java virtual machine

2. Overview of Java

Constants, Variables, Data Types, Java Tokens, Declaration of variable, Giving Values to variables, Scope of Variables, Symbolic Constants, Type Casting, Getting Blues of variables, Standard Default values, Java Statements

Introduction, simple java program, An application with two classes, Java program structure, implementation of a java program, Command Line Arguments

3. Classes, Object and Methods

Introduction, Defining a class, Adding variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors. Method Overloading, Static Members, Nesting of Method, Inheritance: Extending a class, Overriding Method, Final variable and Methods.

4. Interfaces - Multiple Inheritances

Introduction, Defining Interface, Extending Interface, Implementing Interface.

5. Arrays & Strings

Introduction, One-dimensional Arrays, Creating an one dimensional array, Two dimensional Arrays, Creating an two dimensional array, String Arrays, String Method

6. Packages: Putting Classes Together

Introduction, Java API package, Using system packages, Naming Conventions, Creating Packages, Accessing a package, Using a Package, Adding a class to a package.

7. Applet Programing

Introduction, how applets differ from applications, preparing to write applets, building applet code, applet life cycle

Ref. Books :

1. Programming with Java - A primer -By E. Balagurusamy (Tata Me Graw Hill)

2. Java 2 Complete Reference

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Paper No: X :

Computer Lab-2

(Practical)

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Annual Practical based on Paper No VI & VIII , At least 20 practical exercise from paper No VI & VIII consisting of Study of digital electronics , Assembly language programming and Interfacing.

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Paper No: XI :

Computer Lab-3

(Practical)

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Annual Practical based on Paper No VII & IX At least 20 practical exercise based on programming in C++ and Java.