VIDYASAGAR UNIVERSITY

COMPUTER SCIENCE
(Honours & General)

Under Graduate Syllabus
(3 Tier Examination Pattern)
w.e.f. 2014-2015

REVISED

Vidyasagar University
Midnapore 721 102
West Bengal

3 Year Degree Course Syllabus

Computer Science
(General)

PART – I

PAPER-I (TH)	**100 Marks**
GROUP - A: Computer Fundamental	20 Marks
GROUP - B: Digital Electronics	20 Marks
GROUP - C: Programming in C	25 Marks
GROUP - D: Data Structure	25 Marks
Internal Assessment –	10 Marks

PART – II

PAPER –II	**100 Marks**
GROUP – A (TH)	
Unit-I: Basic concepts of Operating Systems	20 Marks
Unit- II: Data Base Management Systems	25 Marks
Internal Assessment –	05 Marks
GROUP – B (PR)	
Data Base Management Systems (ORACLE)	40 Marks
Practical Note Book & VIVA	10 Marks

PAPER -III (PR)	**100 Marks**
GROUP – A: Digital Electronics	25 Marks
GROUP – B: Programming in C and Data Structure	35 Marks
GROUP – C: MS-Word , Excel and PowerPoint	20 Marks
Practical Note Book & VIVA	20 Marks

PART – III

PAPER –IV	**100 Marks**
GROUP –A (TH)	
Unit-I: Computer Networks	25 Marks
Unit-II : OOPs using C++	20 Marks
Internal Assessment –	05 Marks
GROUP – B (PR)	**50 Marks**
Programming in C++	25 Marks
Practical Note Book & VIVA	05 Marks
Seminar /Project	20 Marks

COMPUTER SCIENCE (General)
PART-I
PAPER -I

Theoretical **F.M. -100**

(University examination: 90 & Internal Assessment in College: 10)

Group-A: Computer Fundamental **20 Marks**

Brief introduction of computers generations, Types of computer, Computer system -CPU (ALU and control unit), I/O units, Primary and secondary storage, Machine language, Assembly language and High level language, Types of software, Concept of algorithm and flowchart.

- **Reference Books:**
  1. Fundamentals of Digital Circuits, Anand Kumar, PHI
  2. Raja Raman. V: Fundamentals of computers, PHI

Group -B: Digital Electronics **20 Marks**

Number system: Decimal, Binary, Octal, Hexadecimal number systems, conversion from one number system to another. Signed and unsigned integers, r's and (r-1)'s complement, Binary arithmetic, fixed and floating point number representation, BCD arithmetic.

Bit, Byte, Nibble, Word, Basic structure of Computer-I/O unit, Arithmetic Logical Unit, Memory Unit, Control Unit, Peripheral devices -different of I/O Units, Dot-matrix printer, Laser printer, Floppy disk, magnetic tape, Magnetic disk, Memory devices ROM, RAM, Serial Access and Direct Access memories.

Boolean Algebra: Postulates and Theorems, OR, AND, NOT operators, Truth tables, Boolean identities, De Morgan's theorems. Logic gates -AND, OR, NOT, NAND, NOR Exclusive-OR Boolean functions, Half-Adder, Full Adder, Memory Circuits -Flip-Flop.

- **Reference Books:**
  1. Fundamentals of Digital Circuits, Anand Kumar, PHI
  2. Digital Electronics, Tokheim, TMH
  3. Digital Electronics, S. Rangnekar, ISTE/EXCEL
  4. Digital Logic & Computer Design, M. Morris Mano
  5. Introduction to Digital Computer Design, An, 5th ed., Rajaraman & Radhakrishnan
  6. Digital Electronics – P. Raja

Group -C: Programming in C **25 Marks**

C - Language: Basics, Types of operations and expressions, Variable names, Data type, Arithmetic, relational and logical operators. Type conversion. Bit wise logical operators and conditional expressions.

Control Flow: Statements and blocks, If-else, else-if, switch statement, while, for and do-while loop, break, continue and goto statements. Functions: Functions, arguments, auto, external, static and register variables, recursion.
Arrays: Basic Concepts, Memory Representation, One Dimensional Arrays, Two Dimensional Arrays

Pointers: Basic Concepts, &, * Operator, Pointer expression: assignment, arithmetic, comparison, Dynamic Memory Allocation.

- **Reference Books:**
  1. C Programming, Stephen Kochan
  2. Programming with C, Schaum's Series
  3. C Programming , V. Balaguru Swami

Group -D: Data Structure **25 Marks**

Introduction to algorithm, analysis for time and space requirements. Linear data structures: Array, stack, queue, circular queue, deque and their operations

and applications.Trees: Definition, Binary Trees, Strictly Binary Trees, Complete and Full Binary Trees, Tree Traversing (Inorder, Preorder and Postorder).Searching: Linear and Binary search.Sorting: Bubble, Insertion & Selection sort.

- **Reference Books:**
  1. Data Structure using C – Rajni Jindal – Umesh Publication
  2. Data Structure using C – B. Baluja Dhanpatrai Publication
  3. Classic Data Structures, 2nd ed., Samanta

Internal Assessment **10 Marks**

PART-II
PAPER -II

Theoretical **F.M.-50**

(University Examination: 45 & Internal Assessment in College: 05)

GROUP – A (TH)

Unit-I: Basic concepts of Operating Systems **20 Marks**

Introduction: What is OS, Operating system functions, Different types of O.S.: single user, multi user, GUI, multi-programmed, multi processing, multi tasking, batch, time-sharing, real-time.

Processes: Concept of processes, process state, PCB.

CPU scheduling: Definition, preemptive & non-preemptive scheduling, scheduling algorithms (FCFS, SJF, & RR), long-term scheduler, short-term scheduler & medium-term scheduler.

Memory Management: Contiguous memory allocation, paging, page replacement algorithms, swapping.

- **References Books:**

  1. Milenkovie M., "Operating System : Concept & Design", McGraw Hill.

  2. Tanenbaum A.S., "Operating System Design & Implementation", Practice Hall NJ.

  3. Silbersehatz A. and Peterson J. L., "Operating System Concepts", Wiley.

  4. Dhamdhere: Operating System TMH

Unit-II: Data Base Management Systems **25 Marks**

Basic concepts: Entity, Attributes, Data Base, DBMS, different types of keys. Relational Algebra: Union, Intersection, Subtraction, Cartesian Product, Division, Natural Join, Selection and Projection.

Database Design: ANSI/SPARC 3-Level Architecture, Conceptual Model, Logical Model, Physical Model, ER Diagram, Strong and Weak Entities.

Structured Query Languages: Create Simple Queries Using Single Table.

Functional dependencies: first, second and third normal forms.

- **Reference Books:**

  1. The complete reference-By Coach and loney

  2. A Beginners guide- By Abbey and corney

  3. Database System-Elmasri and Navathe

Internal Assessment **05 Marks**

Practical
F.M.-5O
GROUP – B (PR)

Data Base Management Systems **40 Marks**
ORACLE

1. Creating a Database: Creating a Table, Data Types.
2. Table and Record Handling: INSERT statement, Using SELECT and INSERT together, DELETE, UPDATE, DROP, ALTER statements.
3. Retrieving Data from a Database: The SELECT statement, Using the WHERE clause, Using Logical Operators in the WHERE clause Using IN, LIKE, ORDER BY.
4. SQL.

Practical Note Book & VIVA **10 Marks**

PAPER-III (PR)

Practical **F.M.-100**
Group -A: Digital Electronics **25 Marks**

1. Familiarization with the following digital IC's NAND and NOR gates.
2. Demonstrate the Universal nature of NAND and NOR gates by relating AND, OR and NOT gates using IC.
3. Set up Exclusive -OR function using NAND & NOR gates.
4. Set up combinational circuits to implement some Boolean functions and test them.
5. Demonstrate the use of Half-Adder using five NAND/NOR gates.
6. Demonstrate the working of Full-Adder with NAND/NOR gates.

Group -B: Programming in C and Data Structure 35 Marks

1. Program on control statement (IF, Switch, LOOP), Arrays, Functions.
2. Searching: Linear & Binary.
3. Sorting: Bubble, Insertion.
4. String manipulation: No. of vowel's, Consonants & words; abbreviation, string palindrome.
5. Arrays: Insert Delete, Stack, Queue, Transpose of a matrix, Add two matrixes.
6. Recursion: Factorial, Fibonacci series, GCD.
7. Searching: Linear & Binary Search.
8. Sorting: Bubble, Selection, and Insertion.

Group -C: MS Word, EXCEL and Power Point 20 Marks

Concept of general tools of MS word, Excel and Powerpoint. Document prepare and analysis using Ms-Excel, Presentation slide prepared using animation

Practical Note Book & VIVA (10+10) =20 Marks

PART-III

PAPER-IV **100 Marks**

Theoretical **F.M.-50**

(University Examination: 45 & Internal Assessment in College: 05)

GROUP –A (TH)

Unit – I: Computer Networks **25 Marks**

Introduction to Data Communication and network, Overview of ISO-OSI model.

Physical layer: Network Topology, types of network, network protocols, Transmission Mode. Multiplexing: FDM, WDM & TDM. Transmission media: Guided media, Unguided media. Circuit & Packet Switching.

Data Link Layer: Error Detection - Type of Error, Detection, Error Correction, framing, Flow and error control, CRC, Hamming Code.

Network Layer: IP Addressing, IPV4, routing, Gateway.

Application Layer: DNS, SMTP, FTP, HTTP, WWW.

- **Reference Books:**
  1. *Data Communication & Networking – Behuouz A. Forouzan, TMH*
  2. *Computer Network – A.S Tanenbaum, Pearson Education*

Unit – II: OOPS Using C++ **20 Marks**

Principles of Object Oriented Programming (OOP) : Evolution of C++ - Programming Paradigms - Key Concepts of OOP - Advantages of OOP - Usage of OOP and C++ .Input and Output in C++-Streams-Stream classes

Unformatted console I/O operations-Member functions of istream class-manipulators-manipulators with parameters

Introduction to C++: Tokens, Keywords, Identifiers, Variables, Operators, Expressions and Control Structures: If,If..Else, Switch - Repetitive Statements- for, while, do..while, Pointers and arrays
Inline Functions, friend function, function Overloading and Operator Overloading, Classes and Objects, Constructors and Destructors, Type of Constructors

Inheritance: Single Inheritance ,Multilevel inheritance ,Multiple inheritance, Hierarchical Inheritance , Hybrid Inheritance. Pointers - Virtual Functions and Polymorphism

- **Reference Books:**

  1. *E. Balaguruswami – Object Oriented programming with C++*
  2. *Kris James – Success with C++*
  3. *David Parsons – Object Oriented programming with C++*
  4. *D. Ravichandran – Programming in C++*
  5. *Dewhurst and Stark – Programming in C++*
  6. *Venugopal, Ravishankar, Rajkumar – Mastering C++*

Internal Assessment **05 Marks**

Practical
F.M.-5O Marks

GROUP – B (PR):

Programming in C++	**15 Marks**
Practical Note Book & VIVA	05 Marks

GROUP –C: Project (Based on VB/PHP/dot NET/Mobile Technology/Web Application etc.)

Marks Allotment for Project:

Project & Thesis:	20 Marks
Project presentation & VIVA:	10 Marks

Project guide will be faculty members of respective colleges. For external project at least one internal guide is require for each project. In case of group project not more than three students participate. Individual project is preferred.