

B. Sc. Computer Science
III Semester
Course : US03CCS01
(Fundamentals of Computer Programming Using C)

Credits : 3
Lectures per week : 3
University examination duration : 3 Hours
All units carry equal weightage.

Unit 1. Development of Algorithms and Flow Charts

- Concept of an algorithm and a flow chart, need and definition
- Symbols used to draw a flow chart
- Typical (primitive) examples of flow charts and algorithms

Unit 2. Language Fundamentals

- Generations of computer languages
- High-level and low-level languages
- Translators
- Introduction to Editors and details about one of the editors

Unit 3. Logic Development

- Problem analysis
- Variables, expressions & manipulation
- Data types in a high-level language, operators
- I/O statements, Assignment statements

Unit 4. Structured Programming

- Control strategies, Conditions & Loop statements
- Method of structured programming

Unit 5. Complex Data Types and Command-line Arguments

- Arrays, string handling.
- Command-line arguments

Unit 6. Functions

- Working with functions
- Calling functions, passing arguments
- Common standard library functions
- User-defined functions

MAIN REFERENCE BOOKS :

1. Kernighan B., Ritchie D. : The C Programming Language, Prentice Hall.
2. Cooper H. & Mullish H : The Sprit of C, Jaico Publication House, New Delhi.
3. Balaguruswami : Programming in ANSI C., Tata McGraw Hill Publication.

Course : US03CCS02
(Computer Organization)

Credits : 3
Lectures per week : 3
University examination duration : 3 Hours
All units carry equal weightage.

Unit 1. Introduction to Computers

- Block diagram of a simple computer and significance of different functional units
- Evolution of computers
- Definitions of the terms : hardware, software
- Applications of computers

Unit 2. Number systems

- Binary, octal, decimal, and hexadecimal number systems
- Conversion of numbers among binary, octal, decimal, and hexadecimal number systems
- Addition and subtraction of binary numbers

Unit 3. Representation of Information

- Representation of integers
- Character codes (ASCII, Unicode)
- Error detection and correction codes

Unit 4. Processor and its Functions

- Instruction execution cycle
- CPU organization
- Parallel instruction execution
- Array processors, Multiprocessors
- Multiple functional units
- Pipelining

Unit 5. Memory and Addressing Techniques

- Primary memory – Introduction to RAM, ROM, Cache, Registers
- Secondary memory
- Various types and organization of secondary storage devices such as magnetic disks, optical disks, flash memories.
- Addressing techniques like Immediate, Direct, Indirect, Register, Indexing and Stack

Unit 6. I/O Devices

- Common types of Input/Output devices, such as
- Monitors, keyboard, mouse
- Printers (Line, Dot Matrix, Inkjet, Laser)
- Scanners

MAIN REFERENCE BOOKS :

1. Tanenbaum A.S. : Structured Computer Organization, Prentice-Hall of India Pvt. Ltd.
2. Rajaraman V. : Computer Fundamentals, Prentice-Hall of India Pvt. Ltd.

Course : US03CCS03
(Practicals)

Credits : 3
No. of laboratory hours per week : 6
University examination duration : 3 Hours

- **Practical Based on US03CCS01**

Course : US03ECS01
(Digital Computer Electronics)

Credits : 2

Lectures per week : 2

University examination duration : 2 Hours

All units carry equal weightage.

Unit 1. Gates and Boolean Algebra

- Gates, Boolean algebra, Truth tables
- Circuit equivalence, De Morgan's theorems

Unit 2. Basic Digital Logic Circuits-I

- Usage of Karnaugh maps
- Encoders, decoders, comparators

Unit 3. Basic Digital Logic Circuits-II

- Half adder, full adder, binary adder-subtractor
- Multiplexers

Unit 4. Memory Elements & Counters

- D Flip flops
- Shift-left, shift-right and controlled buffer registers
- Ring counters

MAIN REFERENCE BOOKS :

1. Malvino A. P.: Digital Computer Electronics, 2nd Edition, Tata McGraw, Hill Pub. Co. Ltd., New Delhi, 1990.
2. Gothmann, William H. : Digital Electronics - An Introduction to Theory and Practice, 2nd Edition, PHI, 1982.

BOOKS FOR ADDITIONAL READING :

1. Tanenbaum A. S. : Structured Computer Organization, 3rd Edition, Prentice-Hall of India Pvt. Ltd., 1993.
2. Hall Douglas V. : Microprocessors and Interfacing - Programming and Hardware., McGraw Hill Book Company, 1986.
3. M.M. Mano : Computer System Architecture, 3rd Edition, Pearson Education, 2000.

Course : US03ECS02
(Management Information System)

Credits : 2
Lectures per week : 2
University examination duration : 2 Hours
All units carry equal weightage.

Unit 1. MIS – Introduction

- Introduction to MIS, Problems with MIS, Knowledge requirements for MIS(7 areas), DSS, EIS, ES, 4GL, IT & MIS : What is IT? Is computer essential for MIS?
- Office supporting system(Whole)
- Computer and MIS.
- Data Processing System.
- Characteristics of DPS.
- Scope of Trans. Processing
- Example of Sales Order Processing

Unit 2. Information, Data & Communication

- Information & Management, Information Classifications.
- Definition: Data and Information, Data Characteristics.
- What is Information? Functions performed by information, Characteristics of information.
- Communication System, Information in an organization.

Unit 3. Planning and Decision Making

- Planning and Planning terms, Objectives, Policies, Levels of Planning, Planning Problems.
- Type and Sources of Planning Information.
- Decision Making, Programmed and Non-programmed decisions, Levels of Decision Making.

Unit 4. Elements of Control

- Concept of control in management, Elements of control cycle, Different Feedback loops, Control in Organizations, Scope of management control
- Total Quality Control – TQC
- Total Quality Management – TQM.

MAIN REFERENCE BOOKS :

1. T Lucey: Management Information Systems, BPB Publication.
2. W.S. Jawadekar, Management Information Systems - Tata McGraw Hill Publishing Company Ltd..

Course : US03ECS03
(Business Data Processing through COBOL)

Credits : 2
Lectures per week : 2
University examination duration : 2 Hours
All units carry equal weightage.

Unit 1. Introduction

- Structured programming concepts
- Meaning of the terms : record, file
- Introduction to COBOL, divisions and their uses
- Data division entries : level structure, picture clause, value clause, editing characters, classes & categories of data, special-names paragraph, usage clause, justified clause

Unit 2. COBOL Programming - I

- Verbs used for arithmetic operations: Add, Subtract, Multiply, Divide, Compute, Add corresponding, Subtract corresponding
- Data movement verb : Move
- Input and output verbs
- Goto, Stop, Open, close, read, write, accept, display
- Categories of COBOL statements

Unit 3. COBOL Programming - II

- Conditions, If statement, Go To with Depending phrase, Perform statement, Exit statement
- Redefines, renames, qualification of data, sign clause
- OCCURS clause and subscripting, assigning values to table elements, multi-dimensional tables
- PERFORM verb and table handling, SORT verb, MERGE verb, Examine verb, Inspect verb, String and Unstring verbs
- Cobol subprograms

Unit 4. Introduction to File Organization

- Introduction to file organization
- Types of files : Sequential file organization, Random or direct organization, Indexed sequential organization
- Addition and deletion of records in indexed file
- Direct addressing
- File updation

MAIN REFERENCE BOOKS :

1. Roy. M. K. & Dastidar Ghosh. D. : Cobol Programming, Tata McGraw Hill Publications Comp.. 1982
2. Philipakis and Kazmier : Information System through Cobol, 2nd Edition, McGraw Hill Int. Editions
3. Cobol Programming with Business Applications By N. L. Sarda, Pitamber Publishing Company
4. Schaum's Outline Series : Theory and Problems of Data Processing, McGraw Hill Publication