SARDAR PATEL UNIVERSITY
Programme – MCA
(Under Choice Based Credit Scheme)
Semester – I
Syllabus with effect from : 2017-18
MCA

COMPUTER PROGRAMMING & PROBLEM SOLVING

COURSE NO: PS01CMCA21

(3 Lectures & 1 Seminar/Tutorial per week   Total Marks: 100)

COURSE CONTENT:

1. Introduction
- Introductory concepts, computer characteristics, application areas, stored program concept, editors.
- Types of Programming Languages, High & Low level language, Compiler, Translator, Machine Language.

2. Logic Development
- Problem Analysis, Flow charts, algorithms.
- Variables, Expressions & their manipulation.
- Data types in High level language, operators.
- I/O statements, Assignment statement.
- Control strategies, Condition & Loop Statements.

3. Structured Programming & Advance Computing
- Method of Structured Programming, Subroutines.
- Arrays, String handling
- Structure, Pointer, Union, Storage memory.

4. Register References, Command line arguments and File Handling
- I/O Statement.
- File access in R, W, R+, W+, A, A+
- Logical file Organization.

MAIN REFERENCE BOOKS:
1. Kernighan B. W. & Ritchie D. M: The C Programming Language,   Prentice Hall, India, 1988.

2. Cooper H. & Mullish H. : The Sprit of C, Jaico Publication House, New Delhi,

BOOKS FOR ADDITIONAL READING:
1. Kaicker S: Programming with C,MacMillan, India, 1989.
2. Schildt H.: The C made Easy,McGraw Hill Book Co.,1987.

LOGICAL ORGANIZATION OF COMPUTERS

COURSE NO: PS01CMCA22

(3 Lectures & 1 Seminar/Tutorial per week   Total Marks: 100)

COURSE CONTENT:

1. Introduction and Processor Organization
- Block diagram of a simple computer and its different functional units
- Number systems, Conversion
- Representation of information: integer & floating-point number representation, character codes
- Error detection and correction codes
- CPU organization
- Instruction execution
- Instruction-level parallelism: pipelining, superscalar architectures
- Processor-level parallelism: array processors, multiprocessors, multicomputers
- Microprocessor chips, Architecture of a typical microprocessor
- RISC Vs. CISC

2. Memory, Input/Output, Instruction Formats and Flow of Control

- Memory: main memory, secondary memory, types & organization
- Input/Output: common types of I/O devices, Controllers
- Design criteria for instruction formats
- Addressing techniques, Instruction types
- Traps & Interrupts

3. Gates and Basic Logic Circuits
- Gates, Boolean algebra, Truth tables
- Circuit equivalence, De Morgan's theorems

- Integrated circuits
- Combinational circuits

4. Arithmetic Circuits, Memory Elements & Counters
- Arithmetic circuits
- Latches, Flip flops
- Registers, Counters

MAIN REFERENCE BOOKS :
1. Tanenbaum A. S. : Structured Computer Organization, 3rd Edition, Prentice-Hall of India Pvt. Ltd., 1993.
2. Malvino A. P.: Digital Computer Electronics,2nd Edition, Tata McGraw, Hill Pub. Co. Ltd.,New Delhi, 1990.

BOOKS FOR ADDITIONAL READING :

1. Gothmann, William H. : Digital Electronics - An Introduction to Theory and Practice, 2nd Edition,PHI,1982.
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.

DATABASE MANAGEMENT SYSTEMS - I

COURSE NO: PS01CMCA23

(3 Lectures & 1 Seminar/Tutorial per week   Total Marks: 100)

COURSE CONTENT:

1. **Introduction to Database Systems and the Relational Model**
   - Database systems: needs, definitions, aims, characteristics, advantages and evolution
   - Users associated with database systems and their roles
   - Important concepts in database technology: categories of data models (internal level models, conceptual level models and external level models), the system catalog, data independence, data sharing, relationships between data, data integrity, data protection (security, backup and recovery) and data redundancy control
   - The relational data model: historical importance, concepts and terminology, differences between conventional and relational databases

2. **Relational Databases: Codd Rules, integrity Constraints, Data Modeling**
   - Codd rules and their relevance over a period of time, operations on data and integrity constraints (domain, entity, referential and semantic/arbitrary)
   - The Entity-Relationship (ER) model: entities, attributes (simple v/s composite, single-valued v/s multi-valued, complex, stored v/s derived), entity keys, relationships, their degree, cardinality ratios for binary relationships (1:1, 1:N, N:1, M:N), attributes of relationships, strong v/s weak entities, recursive relationships and role names, notations
   - The transformation of an ER model into the relational model

3. **Structured Query Language - I**
   - Introduction to SQL
   - SQL sublanguages – DDL, DML, DCL
   - Basic data types
   - Tables: creation, structural modification, removal
   - Integrity constraints
   - Table data: selection, insertion, update, deletion
   - Data dictionary
   - Filtering using WHERE clause
   - Ordering using ORDER BY
   - Built-in functions – mathematical functions, data type conversion functions, string functions, date & time functions, formatting functions

4. Structured Query Language - II
   - Grouping using GROUP BY and HAVING
   - Aggregate functions
   - Joins
   - Sub queries
   - Set operations
   - Other database objects like views and sequences
   - Commit, rollback, savepoints
   - Examples of SQL queries

MAIN REFERENCE BOOKS :
1. Elmasri, Navathe, Somayajulu and Gupta : Fundamentals of Database Systems, Pearson Education, 2006
2. Desai, Bipin C. : An Introduction to Database Systems, Galgotia Publication Pvt. Ltd., 2005
3. Groff and Weinberg . :The complete reference SQL. 2nd Edition, Tata McGraw, 2003

BOOKS FOR ADDITIONAL READING :
1. Date, C. J. : An Introduction to Database Systems, 7th Edition, Pearson Education Asia, 2001
2. Silberschatz, Korth, Sudarshan : Database System Concepts, 5th Edition, McGraw Hill International, 2006
3. Dillon, Beck and Kyte : Beginning Oracle Programming, Apress, 2004.
4. Documentation of relevant software packages

SYSTEM ANALYSIS AND DESIGN

COURSE NO: PS01CMCA24

(3 Lectures & 1 Seminar/Tutorial per week)   (Total Marks: 100)

COURSE CONTENT:

| **Unit No.** | Topics |

Topics

1. **Introduction**
   - General Architecture of Systems with basic components,
   - Open and Close Systems,
   - TPS, MIS, DSS and ES Types of Systems,
   - Examples of Real-life Systems,
   - System Analyst: Role & Needs,
   - Various users of Systems.

2. **Systems Development Life Cycle and Requirements Determinations**
   - Phases of the Classical Systems Development Life Cycle (SDLC) Method: Preliminary Investigation, Determination of Requirements, Design of System, Development of System, System Testing, Implementation, etc.
   - Requirement Anticipation, Requirements Investigation with Fact Finding Techniques, Decision Trees, Decision Table, and Structured English.

3. **Structured Systems Development Strategy**
   - Function Decomposition Diagrams(FDD),
   - Symbols of Data Flow diagrams,
   - Data Flow Diagrams   (DFD),
   - Data Dictionary,
   - Application Prototype Development strategy.

4. **Computer-Aided Systems Tools and Software Quality**
   - Tools, Computerized Tools, Front End and Back End Tools, Integrated tools
   - Computer Aided Systems Engineering (CASE) Tools, Advantages and Weakness of CASE,
   - Software Quality parameters, Approaches to Reliability, Quality Assurance and
   - Various Types of Testing and Test Data: Live Data, Artificial Data, Test Libraries,
   - Training Users, Objectives for Training, Conversion Methods, Documentation
   - Follow-up and Maintenance, Post Implementation Review.

MAIN REFERENCE BOOKS:
1. James A Senn: Analysis and Design of Information System, McGraw Hill International, 2003.

2. Kendall and Kendall: Systems analysis and Design, 5th Edition, Prentice-Hall of India Private Limited, 2003.

BOOKS FOR ADDITIONAL READING:

1. V. Rajaraman: Analysis and Design of Information Systems, Prentice-Hall of India Private Limited, 2003.
2. Jeffrey L. Whitten, Lonnie D. Bentely and Kevin C. Dittman: Systems Analysis and Design Methods, Tata McGraw Hill Publishing Co. Ltd., 2001.
3. Tuthill and Leavy, Knowledge Based Systems: Mangers Perspectives, Tab professional and Reference Books, 1991.

PRACTICALS

COURSE NO : PS01CMCA25

Practicals based on PS01CMCA21 and PS01CMCA23

Fundamentals of Mathematics and Accounting

COURSE NO: PS01FMCA21

(3 Lectures & 1 Seminar/Tutorial per week   Total Marks: 100)

COURSE CONTENT:

1   Matrices and Logic
- Row/Column operations
- Gaussian Elimination
- Decomposition, Inverse
- Logic operators AND, OR etc., Truth tables
- Theory of inference and deduction
- Mathematical Inductions

2   Graphs
- Basics of Graph
- Application areas of graphs
- Connected graphs, Sub-graphs, Euler graphs, Complete graph
- Operations on graphs
- Binary tree and its uses,
- Spanning trees, Fundamental Circuits
- Incidence matrix, adjacency matrices and their properties

3   Introduction of Accounting & The Accounting Process
- Introduction of Accounting and Accounting terms.
- Classification of Accounts and Principle of Debit and Credit
- Journalizing
- Ledger
- Trial Balance

4   Final Accounts
- Trading account
- Profit and Loss Account
- Balance Sheet with Adjustment Entries
- Introduction of an accounting package with demonstration

MAIN REFERENCE BOOKS:

1. Hans Schneider and George P Barker : Matrices and Linear algebra, Holt Rinehart, 1968.
2. Deo. N : Graph Theory with Application to Engineering, PHI, 1974.
3. Maheswari S. N., Sharad Maheshwari & Suneel K Maheshwari : An Introduction to Accountancy, 11/e, Vikas Pub. House

BOOKS FOR ADDITIONAL READING :
1. Rajni Sofat & preeti Hiror : Basic Accounting, PHI Learning Pvt Ltd.
2. M. M. Chokshi : Principles & Practice in Double Entry, Book keeping., Acharya Book Depot, Baroda,1965.