Swami Ramanand Teerth Marathwada University
Choice Based Course Credit System -2014
Master of Computer Applications
Campus Schools of SRTM University
(w.e.f. Academic Year 2014-15)

Preamble:

University Grants commission in move to set out the much needed academic and examination reforms in Higher education and promotion of quality and excellence in Universities Initiated discussion and implementation programs during XI plan period. The outcome of the prolonged and intensive deliberations of various committees and eminent educationalists UGC prepared and circulated an **Action Plan for Academic and Administrative Reforms** (UGC DO No.F1-2/2009 (XI plan) dated 31st January 2009). The UGC action plan suggested step by step reforms in respect of Semester system, Choice Based Credit System (CBCS), Curriculum development, Admission Procedures and examination reforms to be adopted by the universities and colleges. The need of the hour is to change from traditional information based knowledge to a more holistic approach providing value based education integrating with special skills and training to make a student into a better human being and an authoritative member of society.

Now the university is decided to implement Choice Based Credit System (CBCS) in all the curricula of Campus schools and affiliated colleges from the academic Year 2014-15.

Objectives of the MCA course:

The M.C.A. program prepares students to take up positions as systems analysts, systems designers, programmers, and managers in any field related to information technology. The program, therefore, aims at imparting comprehensive knowledge with equal emphasis on theory and practice. The M.C.A. students are encouraged to spend a full semester working in the industry/ in the institute giving them insight into the workings of the IT world. However, the course curriculum will have enough flexibility to enable a student to undertake advance studies in Computer Science later on.

M. C. A. First Year [Two Semesters]

	Semester I			
Code No.	Title of the Paper	Internal Credits	External Credits	Total Credits
MCA-101	Information Technology	2	2	4
MCA-102	Computer Architecture and Organization	2	2	4
MCA-103	Programming Methods	2	2	4
MCA-104	Introduction to Management Functions	2	2	4
MCA-105	Mathematical Foundations of Computer Science	2	2	4
MCA-106	Lab-1. Programming Methods using C	1	1	2
MCA-107	Lab-2. Soft Computing(IT)	1	1	2
MCA-108	Seminar -1 on Current Topic and Trends	1	0	1
	Total Credits	**13**	**12**	**25**

	Semester II			
Code No.	Title of the Paper	Internal Credits	External Credits	Total Credits
MCA-201	Information system Analysis and Design	2	2	4
MCA -202	Data structures and Algorithm	2	2	4
MCA -203	Oral and Written Communication skills	2	2	4
MCA -204	Data Base Management System	2	2	4
MCA -205	Graph Theory	2	2	4
MCA -206	Lab- 3 (Data Structure)	1	1	2
MCA -207	Lab- 4 DBMS (My SQL)	1	1	2
MCA -208	Group Discussion	1	0	1
	Total Credits	**13**	**12**	**25**

Semester	Internal Credits	External Credits	Total Credits
I	13	12	25
II	13	12	25
III	13	12	25
IV	13	12	25
V	13	12	25
VI	13	12	25
Total Credits	**78**	**72**	**150**

MCAS-101 Information Technology (4 Credits)

Unit 1. Introduction
Computer Definition, Uses, Characteristics, Generation Of Computer, Block Diagram Of Computer, Input Devices: Keyboard, Point and Draw devices, Data Scanning devices, Digitizer, Electronic card reader, Voice Recognition device, Vision input device,
Output Devices: Monitor, Printer, Plotter, Screen Image Projector, Voice Response System

Unit 2. Computer Memory
Primary and Secondary memory, Memory Hierarchy, Auxiliary Memory, Associate Memory, Cache Memory, Virtual Memory, Classification of computer

Unit 3. Software
System Software / Application Software Compilers, Interpreters, assemblers Linker, Loader
Programming Language Paradigm - High Level, Low level
Files - Types & operations, File Organization & accessing techniques – Indexed, sequential, hashed. File Handling functions – sorting, merging, Indexing & updating. Concept of file alloc

Unit 4. Operating System Fundamentals
Functions of OS, Roots of MS-DOS, The Kingdom of Dos
1. ROM Software ,2. ROM Startup Routines ,3. ROM-BIOS Routines 4. ROM BASIC Routines 5. ROM Extension Routines
Booting , Physical Structure of Disk, Logical Structure of Floppy Disk, Detailed Boot –

Unit 5. Networking Concepts
Data Communication Concepts, Classification – Serial/Parallel, simplex, half duplex, full duplex. Communication Media – Wired/microwave, E-mail.
LAN, WAN, MAN, Internet, intranet (Basic Concepts), Topologies, Protocols(Introduction), Media Access Methods – Ethernet, Arcnet (no Architecture), Communication Process, OSI – Layers(Introduction)

Unit 6. Microprocessor
Components of Microprocessor, Interfaces & their Tasks, Microprocessor Control Signals (Address, Data and controls), Buses and characteristics , Input/Output Ports, Memories and cache basics, CPU Organization (Pentium Family), Instruction & Execution Cycle

Suggested Readings:
1. Computer Fundamentals: By P.K. Sinha.
2. Operating System Concepts: By Peterson
3. Operating System: By Donovan
4. Computer Networking: By Tenaunbaum
5. Personal Computer Interfaces: By Michel Hordeski - McGrow Hill

MCA -102 Computer Architecture & Organization   **(4 Credits)**

Unit 1. Number system
Introduction to Number system, Binary, Octal, Hexadecimal, binary-complement representation, BCD-ASCII, conversion of numbers from one Number system to the other, binary arithmetic. , Signed numbers, 1's and 2's complement method,

Unit 2. Logic Gates
Basic Logic Gates – Basic Theorems and Properties of Boolean Algebra – NAND, NOR implementation – Sum of Products – Product of Sums, Karnaugh ma, Tabulation Method, Don't Care Conditions. Full Adder, Half Adder,

Unit 3. Processor Organization
General Register Organization - ALU - Instruction codes - Instruction Formats - Stack Organization - Addressing modes

Unit 4. Control Unit
Register transfer and micro operations, Timing and Control, Control Memory, micro programming, Hard wired control

Unit 5. 8085 Microprocessor
Internal Architecture, Instruction Set, Assembly Language programming

 Unit 6. Input – Output organization
 Peripheral Devices,   Input – Output interface , Asynchronous Data Transfer (Strobe & Handshaking Method), Modes of Transfer ,Priority Interrupt , DMA ,

Suggested Readings:
1. M. Morrris Mano, "Digital Logic and Computer Design", PHI.
2. M. Morrris Mano, "Computer system architecture" Third Edition, PHI/ Pearson Education.
3. Albert Paul Malvino, Donald P. Leach, "Digital Principles and Applications", Tata Mc GrawHill Pub. Company Ltd.
4. J.P.Hayes, "Computer Architecture and Organization" Tata Mc Graw Hill Pub. CompanyLt

MCA-103 Programming Methods (4 Credits)

Unit 1. Language Fundamentals
Introduction to Languages, Basic types of languages (Machine, Assembly, High level Languages), History of C Programming, Structures of 'C' Programming, Function as building blocks
Character set, Tokens, Keywords , Identifiers, Variables and Constant, Data Types, comments, Types of operators, Operator Precedence and Associativity, Expression, Statement and types of statements

Unit 2. Built-in function and control structure
Console based I/O and related built-in I/O function:
printf( ), scanf( ),getch( ), getchar( ), putchar( )
Control Structures, Decision making structures, Loop Control structures, and other statements: Break, Continue, Goto, exit

Unit 3. Functions
Basic types of function, Declaration and definition, Function call, Types of function, Parameter passing: Call by value & Call by reference, Scope of variables, Storage classes, Recursion
Arrays: One dimensional array: Definition, declaration and initialization, . Accessing array elements, Displaying array elements, Sorting arrays, Arrays and function,. Memory representation of array, Two Dimensional array & Multidimensional array

Unit 4. Pointers and string Handling
 Definition and declaration, Initialization of pointer, Indirection operator, address of operator
 Pointer arithmetic, Dynamic memory allocation, Arrays and pointers, Function and pointers
 Strings: Definition, declaration and initialization of strings, standard library functions :
Implementation without using standard library Functions

Unit 5. Structures,
 Definition and declaration, Variables initialization, Accessing fields and structure operations
 Nested structures, Union: Definition and declaration. Differentiate between Union and structure

 Unit 6. C Processor and file Handling
C Preprocessor: Definition of Preprocessor, Macro substitution directives, File inclusion directives, Conditional compilation
File handling: Definition of Files, Opening modes of files
Standard function: fopen( ), fclose( ), eof( ), fseek( ),rewind( )
Using text files: fgetc( ), fputc( ), fprintf( ), fscanf( )

Suggested Readings:
1. C - The complete Reference Herbert Schildt TMH
2. The C Programming Language Kerningham and Ritchie
3. Understanding Pointers in C - Y.Kanetkar

MCA -104 Introduction to Management functions (4 Credits)

Unit 1. Introduction to Management
Definition, Characteristics of management, Importance of Management, Administration , Management thoughts: Contribution of F.W. Taylor , Henry Fayol , Peter Drucker, etc Management process school, Systems Management School,

Unit 2. Planning and Controlling
Planning: Definition, Characteristics, Nature, Importance,
Types of Plans:(Standing and Single Use Plans) , Planning Process
Controlling: Concept, Definition, Principles of Controlling, Objectives of controlling, Importance of Controlling

Unit 3. Organizing
Concept, Definition, Process of organization, Principles of organization, Authority, Responsibility and Delegation, Forms of organization. Centralization and Decentralization

Unit 4. Leadership and Motivation
Concept of Leadership, Definition, Qualities of Leadership, Leadership Styles
Motivation: Meaning and Definition, Theories of Motivation1. Maslow's Need Hierarchy McGregor's Theory "X' and Theory 'Y"

Unit 5. Staffing
Human Resource Planning, Recruitment, Selection, Training, Training and development, Performance appraisal methods

Unit 6. Quality Concepts and Social responsibility of Business
Total Quality Management, ISO, Quality Circle
Social Responsibility of Business: Definition, Responsibilities towards owners, workers, consumers, suppliers, state, society etc.

Suggested Readings:
1. Essentials Of Management: Harold Koontz ,Heinz Weihrich, Tata Mcgraw Hill.
2. Principles And Practice Of Management: Dr.S.C.Saxena, Sahitya Bhavan Publications.
3. Principles Of Management: R.N.Gupta, S.Chand & Company

MCA-105 Mathematical Foundation of Computer Science   (4 Credits)

Unit 1. Mathematical Logic
 Propositions, Logical Connectives and compound Propositions, Truth Tables, Logical Equivalence, Algebra Of Propositions, Conditional Propositions, Converse, Contra positive and Inverse, Biconditional Statements, Negation Of Compound Statements, Tautologies, Contradictions and Contingency, Methods Of Proof, Predicate Calculus

Unit 2. Boolean Algebra and Logic Circuits
 Boolean Algebra, Unique Features, Basic Operations, Boolean Functions, De-Morgan's Theorem, Logic Gates, Sum Of Products and Product Of Sums Forms, Normal Form, Expression of Boolean Function as a Canonical Form, Simplification of Boolean Expression, Boolean Expression From Logic and switching Network, Implementation Of Logic Expressions With Logic gates and switching Circuits, Functionally Complete Sets, Karnaugh Map Method For Simplification Of Boolean Expression

Unit 3. Crisps sets and fuzzy sets
 Introduction, Crisps sets, Fuzzy sets, Containment, Normal fuzzy set, Support of fuzzy set
 Alpha Cut set, Basic operation of fuzzy sets, Fuzzy Cartesian product, Fuzzy relation

Unit 4. Relations And Functions
 Relations On Sets, Types Of Relations, Properties Of Relations, Representation Of Relation
 Relational Database, Functions Classification Of Functions
 Types Of Functions, Composition Of Functions, Some Special Functions

Unit 5. Groups Rings And Field
 Binary Operations, Group, Groupoid, Semi Group and Monoid, Sub Group, Cyclic Group
 Permutation Group, Homomorphism and Isomorphism Of groups, Ring, Sub Ring, Fields,

Unit 6. Elements Of Coding Theory
  Introduction, Definitions, Group Codes, Parity-Check and Generator Matrix

Suggested Readings:
1. Text Book of Discrete mathematics. By swapan Kumar sarkar (S Chand and company)
2. Fuzzy sets uncertainty and Information By George J. Klir, Tina A. Folger.(Prentice Hall of India.)
3. Logic for C.S. By Gallier.
4. Discrete maths by Stant.
5. Discrete maths by Tremblay and Manohar.
6. Discrete mathematical structures for computer science By Kolman B and Busby R.
7. Concept of discrete mathematics By Sahni's.
8. Discrete mathematical structure with Application By Tremblay J.P.
9. Practical foundation of mathematics by Taylor.

MCA-106 Lab-1 Programming Method using C
Practicing programs to get exposure to basic data types, algebraic expressions, Conditional statements, Input, Output Formatting, Control structures, arrays, functions, structures, pointers and basic file handling.

MCA-107 Lab-2 Soft Computing (IT)
Introduction to MS Windows(Windows '2000, XP) Desktop, creation of folders and shortcuts, features of Windows explorer Familiarisation and using MS packages – Word, Excel, PowerPoint, basic skills in using these tools.(Version MS-Office'2000).
Introduction to MATLAB and its basic skills.

MCA-108 Seminar -1 on Current Topic and Trends

This one credit course is meant to give students practice speaking in front of an audience and to explore topics. Student chooses the topic based on current trends of computer science. Students will organize presentations for faculty and other students. The topics must be approved by the instructor in advance. To help students to improve his verbal abilities as speakers, each student will receive feedback from the fellow students and the instructors.

Expectations:

Attendance at each seminar is mandatory for all students enrolled. In addition, students are expected to attend all other students' seminars in the department. It is expected that students will actively participate by asking questions of the speaker. The effort by students to meet these expectations will be considered in the determination of your final grade. Due dates will be established for topics, abstracts, and announcements. Failure to meet deadlines will also be taken into account in final grading.

Students should strive for professionalism in all aspects of this class. Speakers should dress professionally, whereas most students choose to use PowerPoint to present their seminar. It is the department's and student responsibility to arrange for any equipment you require.

Each student will give two 20-minute presentations. Explain concepts simply and clearly, and define all terms and acronyms. Be prepared to answer questions after your seminar. Do not "seed" questions in advance to your friends in the audience will consider this as cheating. The seminar will be timed, and should be ±3 minutes of the allotted 20 minutes.

Students will submit a detailed report (15-20 pages) of their Seminar topic.

Student's final grade will be determined by several factors: the quality and content of seminars, improvement from the first to the second, participation in the class as a whole, and ability to meet scheduled deadlines.

Seminar Report Format:

- Understand the related information by reading multiple times.
- Report should be written by an individual student, try to write in your own words.
- Do not copy or cut/ paste it should be seriously discouraged by the concerned faculty.
- Give an introduction and background information on your topic.
- Present any data you have collected thus far.
- Attach the handouts (PPT) of your presentation in your report.