University of Pune

Master of Computer Application (Commerce) Programme
New Structure of MCA(Com)

Introduction:

The Master of Computer Application (commerce) degree Programme shall be a blending of 3 areas of studies viz. Information systems, Software product development and Knowledge processing in a wide variety of Commercial domains including manufacturing, trading agribusinesses and services. The objective of the Programme shall be to developing the system planners and administrators on one hand promoting knowledge entrepreneurs on the other.
The Programme addresses the challenge of focusing on the areas of specific types of IT skill shortages - “Beyond engineers, beyond India”. Mantra of Indian IT industry. This degree programme may be a step to reach the goal,” IT for commercial applications and Business transformation”. The main focus of the Programme shall be on developing competencies required for computer application in business.

Duration:
The duration of MCA(Com) degree shall be Three years, divided into Six Semesters.

Eligibility and Admission:
(a) B.Com , BBA ,BCA , BBM(IB) from recognized University
(b) A Bachelor of Arts with Any Subject from recognized university
(c) A Bachelor of Science with any subject from recognized university
(d) Every Eligible Candidate has to pass the Common Entrance Test conducted by the respective College
(e) The candidate Admitted as per criteria (b) and (c) has to satisfactory complete an additional course in ”Commercial Operations and Business Practices” in semester I of M.C.A.

Programme Structure :

The Courses prescribed under different Semesters shall be as under.

MASTER OF COMPUTER APPLICATION (Commerce) MCA (Com)

Semester	Code	Course Title	Status
Sem-I	101	I.C.T. in Business (Information Communication Technologies)	B.P. Departmental
	102	Systems Organization and Management	university
	103	Programming Fundamentals (C Programming)	university
	104	Statistical and Numerical Methods	university
	105	Operating Systems	university
	106	Software Engineering	university
	107	Computer Laboratory (Practical on C Programming)	
Sem - II	201	Business Protocol and Cross Cultural Communication Skills	Departmental
	202	Data Base Management System	university.
	203	Cost Accounting and Cost Control Techniques	university
	204	Accounting for Management	university
	205	Networking Operations	university
	206	Object Oriented Programming	university
	207	Computer Laboratory (Practicals) DBMS + OOPs.	university
Sem - III	301	Advanced Operating Systems	university
	302	Hardware Configuration and Solutions	Departmental
	303	Enterprise Resource Planning and Management	university
	304	Business Strategies	university
	305	Cyber Law and ethics	university
	306	Financial and Investment Analysis	university
	307	Project Report And Advanced Computer Laboratory	university
Sem - IV	401	Advanced Data Based Management System	university
	402	Data Centre Technologies	university
	403	Web Enabling systems and Business Applications	university
	404	Business and Professional Skills	Departmental
	405	Client Server Technologies	university
	406	Knowledge Management for Business	university
	407	Project Report And Advanced Computer Laboratory	university

Sem- V	501	Content Management System	university
	502	Distributed Database Applications	university
	503	E-Com Practices and Technologies	university
	504	Data Mining and Warehousing	university
	505	Multimedia and Business Administration	Departmental.
	506	Operation Research	university
	507	Project Report And Advanced Computer Laboratory	university
Sem - VI		Industrial Project	university

The Course Contents and Delivery

The MCA(Com) curriculum is aimed at responding to application of Computer and allied technologies to business. Over the period of time the Computers have penetrated and impacted the world of Commerce and Business Operations at Micro level and that the dividing line between Computers and Commerce has almost vanished. The present and future organizations and the commercial operations have almost become speedier and system oriented. The computer applications have successfully branched out in vast emerging commercial sectors like banking and Finance, Manufacturing Services, Trade, public governance etc. They have changed the organic functions of business viz. marketing financing operations, staffing etc. Based on this reality the proposed MCA(Com) model consists of core courses and allied courses, which provide a depth and breadth, that enable students to translate their acquired knowledge into working knowledge.

Throughout the Programme the emphasis of delivery shall be on classroom interaction, group work, business perspectives and applied projects. Along with administered curriculum there can be self managed courses having local context, for which the methods such as professional seminar, Pre seminar meetings where faculty, students and professionals share their experiences and expertise in a congenial environment that encourages open exchange of information and professional contacts etc. can be used. This will help to promote internships and out of class activities where students can test and apply their class room learning.

A typical schedule of delivery of course contest may be as given bellow:

Sr. No.	Activity	No. of Hours Prescribed Per Course Per week	(Per Week, Per Students)
01	Class room interaction	4 Hrs.	24 Hrs.
02	Laboratory Assignments (2 Practical Sessions)	3 Hrs	6 Hrs.
03	Library / Industry based assignments	04	
04	Group Project Work(In addition to project work prescribed under semester III, IV & V)	04	
05	Total Hrs	38	

The College / Institute shall be required to create necessary infrastructure and internal system for all the above activities to the entire satisfaction of the University authorities. The intake of students will be linked up proportionately with availability of hardware and software facilities provided by the college.

Scheme of Evaluation and Examination:

A student will be evaluated in each Course on the basis of following

(a) Continuous internal evaluation consisting of 20 marks. The scheme of continuous internal evaluation shall consist of tutorials 05 Marks, Seminar presentation 05 Marks, Class Test 10 Marks (except for courses under computer lab. Works, Project Works)

(b) Written and practical examination at the end of each semester consisting 80 marks will be conducted by the university **for university papers and exam for departmental paper will be conducted by college .**

(c) evaluation of project report and viva at the end of Sem. III, IV, V.

(d) Evaluation of Sem - VI project will be done by three examiners (1 (one) from college (internal), 1 (one) external send by the University and 1 (one) from industry invited by the college) and the grades will be awarded as (A+,A, B+,B,C+, C and D) where D will be considered as Fail.

Standard of Passing and Award of class:

In order to pass MCA(com) examination a candidate has to obtain minimum 40 % marks in each course in the written examination (32 Out Of 80) .

The award of class will be based on the aggregate marks obtained by the candidate in the First , second and third year MCA(Com) i.e. Semester I to Semester V examinations, as given below:

Class	Mark Awarded	Grade
Pass with Second Class	50-54	B
Pass with Higher Second Class	55-59	B+
Pass with First Class	60-69	A
Pass with distinction	70 and above	A+

The rules relating to conduct of examination, exemptions at the Examinations, payment of Tuition and Exam Fees shall be as prescribed by the University Authorities.

The revision of Structure and Course Contents:

The structure and the content of courses their under will be reviewed by the concern BOS after every three years.

MCA Part I Semester
Additional Introductory Course

Commercial Operations and Business Practices

Notes: -

1. The course is prescribed for the students admitted to MCA (Com. First year) holding Bachelor's degree other than B.Com/B.B.A/BFT/BBM in the faculty of Commerce
2. The duration of the course shall be one semester (July-November) in the First year of admission.
3. The level of teaching and evaluation will be that of UG level
4. The evaluation at the end Module will be based on instant Class Tests & tutorials.
5. The College will handle the course departmentally. The certificate for successful completion with grade awarded will be issued by the Head Of the College/ Department of Commerce. The staff teaching, non-teaching/ involved in course delivery and evaluation will be entitled to receive honorarium as per University norms fixed for PG courses.
6. The College conducting MCA (Com) course shall be required to present the same for inspection if required by the LIC's appointed by the University for MCA (Comm) affiliation, for eligibility record etc.
7. A student concerned will be allowed to appear for MCA (Com) Semester II Examination only on the production of certificate of completion of this requirement by the College.

Syllabus

(Objectives: 1. To know and understand by the students concepts of commerce semantics, modern business forms and practices
2. To gain working knowledge of Business Accounting, Regulatory aspects of business and business practices.

Module 1 (No. Of hours 5) Concepts

Understanding of commerce - terms concepts and special connotation (abort 40) in commercial practices (Trading/Banking & Finance & marketing, Business management)

Module 2 (No. Of hours 8) Business Accounting

Banking and Accountancy - from recording business transactions to preparation of Trial balance - Balance sheet, Profit & Loss account and Understanding other accounting reports, Cost accounting - features - advantages.

Module 3 (No. Of hours 8) Forms of Commercial Organizations

Forms of commercial organizations - Proprietorship firm/Limited Partnership - Limited Company - features - limitations - Principle of limited liability - Public Sector Undertakings (features, types)

Module 4 (No. Of hours 8) Markets

Understanding of markets and constituents therein - Capital Market - Money market - Commodities Market - Labour Market - Buyers and Sellers Markets.

Module 5 (No. Of hours 8) Finance

Business finance - capitalization - Structure - Owned funds - borrowed funds Ploughing back profit - financial plan.

Module 6 (No. Of hours 8) Trade and Industry

Distinction between Home Trade and Foreign trade - Channels of Distribution - Consumer movement - Consumer protection - Consumer education - Types of Industry (feature, important firms)

Common terms and connotations used in Commerce and Commercial transactions

Account, Assets, Liabilities, Return on Investment, Depreciation, Barter, Break-even-point, Equity, Consumer goods, Interest and dividend, Goodwill, Bad debt, Cost of capital, Debtor, Creditor, GDP, Price index, Sensex Gold standard, Grading, Inflation, Insolvency, Inventory, Lead time, leverage (financial) Liquidity Mergers & Acquisitions (M & A), Margin, Mark to Markets, Monopoly, Mortgage, Mutual fund, NAV (Net Asset Value), Net Profit, Opportunity Cost, Holding Company, Products & Services (Manufacturing), Spot Market, Cash Flow Statement, Stock Option, Tangibles, Audit, Trademark, Unit Cost, USP (Unique Selling Proposition), Value Added Tax, Venture Capital, White goods.

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M.C.A.(Com.) Sem - I

Subject: Information Communication Technologies in Business (101)

Objectives:

1) To make the students aware about business communication.
2) To understand dimensions of network communication.
3) To gain knowledge of current trends and communication technologies and its business application.

Sr.No.	Topic	No. of Lectures
UNIT 1	Introduction to communication Meaning & definition - process - functions. Objectives - importance - Essentials of good communication- Cross cultural communication.	8
UNIT 2	Written & Oral Communication Oral communication-meaning culture, nature & scope. Principles of effective oral communication, Art of listening-principles of good listening-Essentials of effective correspondence -Organizational Communication planning & layout of business letter- Letter writing - need & functions of business letters - Report writing & formal communication.	10
UNIT 3	Network Communication Meaning of networking, LAN, WAN's (Local & Wireless area networks), Virtual Private Networks (VPN's), Communication through Internet/E-mail/Mobiles/Telnet/Intranet/Extranet.	10
UNIT 4	Current trends & Communication Technologies Visual Aids - Audio & Video tools Electronic Media Video Conferencing Systems & Tele Conferencing Systems. Mobile Communication Television/radio Transmission Through emails/floppy disc/CDs/Communication software.	10
UNIT 5	Information Technology & Its Business Applications Meaning of IT. History of development of IT. Integration of information technology with business strategies.	10

	Business Application- Mechanisms of internal & external communications Advantages & Disadvantages. Details about National information centre.	

Recommended Books :

1. Business Communication
   Rai, Urmila & Rai, S M: Business communication. (9th edition) Mumbai. Himalaya Publishing House, 2008.

2. Communication
   C. S. Raidu, Himalaya Publishing House, Pune, 8th revised edition

3. Basic Business Communication Skills
   For empowering the internet generation
   Raymond Lesikar & Marie Flatlety, 10th edition, Tata McGraw-Hill Edition

4. Essentials of Business Communication
   Rajendra Pal & J. S. Korlahalli, Sultan Chand & sons, New Delhi

5. Business Communication
   V.K. Jain & Omprakash Biyani, S. Chand & Company, New Delhi.

6. Management Information System : Gordon B. Davis, Margrethe H. Olson
   TATA McGRAW-HILL Publishing Co. Ltd. New Delhi.

7. Management Information System : Waman S Jawadekar
   TATA McGRAW-HILL Publishing Co. Ltd. New Delhi.

8. Information Technology: V. Rajaraman,
   Prentice Hall of India Pvt Ltd., New Delhi- 110 001

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M.C.A. Commerce Sem - I

Subject: Systems Organization and Management (102)

Objectives:

1) To provide basic understanding regarding role of systems in management & organization.
2) To offer clear understanding about the nature & functioning of systems in the organization.

Sr.No.	Topic	No. of Lectures
UNIT 1	**Introduction to Management** Understanding the meaning and definitions of management, Nature of Management, Importance of Management. An overview of management process - planning Organizing, Staffing, Directing, Coordinating and controlling. **Planning** Strategy, plan, policy and programs; purpose of planning; Mission, Vision and goal setting and SWOT analysis, forecasting - need of forecasting in planning, Types of Planning and tools of Forecasting - Moving Average, Exponential Smoothing and Regression Models.	6
UNIT 2	**Organizing** Principles and structure of organization, Theories and types of organization, Concept of Authority, Responsibility, Power, Delegation & Centralization of Authority, Span of Control Formal and informal organization	6
UNIT 3	**Staffing** Meaning nature and principles of staffing, Job Rotation, Job enrichment, Job enlargement. Directing (incl. Decision Making) Communications in the Organization, Motivational Theories, Leadership, Decision Making	8

	Controlling Concepts and Principle of Controlling, Basis Control Processes, Open Loop, Closed Loop and Feed forward Control Mechanisms, Essentials of a good control system	
UNIT 4	**Information Systems, Organization, Management & Strategy** Emergence of Digital Firm in the existing era of IT, Information needs of management at various level of an organization, flow of information in the organization: top down, bottom up and integrated Information System: Meaning, nature and their role Approaches to Information Systems : Technical Approach, Behavioural Approach and Socio Technical Approach Types of Information Systems in Organization: Decision Support System, MIS, Expert System, Knowledge Management System, Transaction Processing System. Importance of information systems in supporting various level of business strategy formulations and decision makings, Software and Hardware Requirements for developing efficient Information System. (It is expected that such discussion should cover the latest developments taking place in software and hardware)	10
UNIT 5	**Information Systems and Managerial Functional Areas** Understanding various processes/decisions involved in Production and Operations management; and determining their information needs. Developing necessary information system for Production and Operation management and their integration with overall enterprises information systems. Processes and decisions required for effective and efficient Sales and Marketing Management; need for necessary information systems for them and their integration with other information systems in an organization. Appreciating the information requirement of a finance manager for various financial decisions in an organization and how suitable information systems for them and their integration with other information system in an organization. Determining information requirements of a personal manager and his/her need for necessary information systems for better decisions. Integrating Personal Management related information systems with overall information system in an organization.	12

UNIT 6	**Current Issues in Information Systems** Role of Intranet and Internet in the development of various information systems in an organization, E-Commerce, Enterprise Resource Planning (ERP), Role of Information Systems in Supply Chain Management, Information Systems and Customer Relation Management (CRM).	8

Recommended Books :

Main Reading

1) Harold Koontz and Heinz Weihrich, "Essentials of Management"
2) C. B. Gupta, "Management Concepts and Practices"
3) W.S. Jawadekar, "Management Information System"
4) James A O'Brien, "Introduction to Information Systems"

Supplementary Reading

1) Gareth R. Jones and Jennifer M. George, "Contemporary Management"
2) K.C. Laudon and J.P. Laudon, " Management Information Systems: Organization and Technology

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M.C.A. Commerce Sem-I

Subject: C Programming (103)

Sr.No.	Topic	No. of Lectures
UNIT 1	Introduction to 'C' Language 1.1 History 1.2 Structures of 'C' Programming 1.3 Function as building blocks	1
UNIT 2	Language Fundamentals 2.1 Character set 2.2 C Tokens 2.3 Keywords 2.4 Identifiers 2.5 Variables 2.6 Constant 2.7 Data Types 2.8 Comments	1
UNIT 3	Operators 3.1 Types of operators 3.2 Precedence and Associativity 3.3 Expression 3.4 Statement and types of statements	1
UNIT 4	Built-in Operators and function 4.1 Console based I/O and related built-in I/O function 4.1.1 printf( ) 4.1.2 scanf( ) 4.1.3 getch( ) 4.1.4 getchar( ) 4.1.5 putchar( ) 4.2 Concept of header files 4.3 Preprocessor directives : 4.3.1 #include 4.3.2 #define	2

UNIT 5	Control Structures 5.1 Decision making structures : 5.1.1 If 5.1.2 If-else 5.1.3 Nested If -else 5.1.4 SwitUNIT 5.2 Loop Control structures : 5.2.1 While 5.2.2 Do-while, 5.2.3 for, Nested for loop 5.3 Other statements : 5.3.1 break 5.3.2 continue 5.3.3 goto 5.3.4 exit	5
UNIT 6	Functions 6.1 Basic types of function 6.2 Declaration and definition 6.3 Function call 6.4 Types of function 6.5 Parameter passing 6.5.1 Call by value 6.5.2 Call by reference 6.6 Scope of variables 6.7 Storage classes 6.8 Recursion.	6
UNIT 7	Arrays 7.1 Definition, declaration and initialization of one dimensional array 7.2 Accessing array elements 7.3 Displaying array elements 7.4 Sorting arrays, 7.5 Arrays and function, 7.6 Two-Dimensional array 7.6.1 declaration and initialization 7.6.2 accessing and displaying 7.6.3 memory representation of array 7.6.3.1 row major, 7.6.3.2 Column major. 7.7 Multidimensional array	5
UNIT 8	Pointers 8.1 Definition and declaration, Initialization 8.2 Indirection operator, address of operator 8.3 Pointer arithmetic 8.4 Dynamic memory allocation 8.5 Arrays and pointers 8.6 Function and pointers	6

UNIT 9	Strings 9.1 Definition, declaration and initialization of strings 9.2 standard library functions : 9.2.1 strlen( ) 9.2.2 strcpy( ) 9.2.3 strcat( ) 9.2.4 strcmp( ) 9.3 Implementation without using standard library Functions	6
UNIT 10	Structures 10.1 Definition and declaration 10.2 Variables initialization 10.3 Accessing fields and structure operations 10.4 Nested structures 10.5 Union 10.5.1. Definition and declaration. 10.6 Differentiate between Union and structure	8
UNIT 11	C Preprocessor 11.1 Definition of Preprocessor 11.2 Macro substitution directives 11.3 File inclusion directives 11.4 Conditional compilation.	2
UNIT 12	Bitwise Operators 12.1 Bitwise operators 12.2 Shift operators 12.3 Masks 12.4 Bit field	1
UNIT 13	File handling 13.1 Definition of Files, Opening modes of files 13.2 Standard function: 13.2.1 fopen( ) 13.2.2 fclose( ) 13.2.3 feof( ) 13.2.4 fseek( ) 13.2.5 rewind( ) 13.3 Using text files: 13.3.1 fgetc( ) 13.3.2 fputc( ) 13.3.4 fprintf( ) 13.3.5 fscanf( )	5
UNIT 14	Command line arguments	1

Recommended Books :

1) Let us C :- Yashwant Kanetkar, BPB publication
2) Programming in C :- Balguruswamy, Tata McGraw-Hill publication
3) The C programming Lang., Pearson Ecl :- Dennis Ritchie, Prentice Hall, Delhi
4) Structured programming approach using C :- Forouzah & Ceilberg, Thomson learning publication.
5) Pointers in C :- Yashwant Kanetkar, BPB publication
6) How to solve it by Computer :- R. G. Dromy
7) Introduction to algorithms :- Cormen, Leiserson, Rivest, Stein
   http://www.cs.utexas.edu/users/rpriece
8) Peter Norton's Introduction to Computers :- Tata McGraw-Hill publication

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M.C.A. Commerce Sem-I

Subject: **Numerical & Statistical Methods (104)**

Objectives:

1) To understand and Master the concepts, techniques & applications of Numerical and Statistical Methods.

2) To develop the skills of solving real life problems using computer programming.

3) To make students to understand the art of applying mathematical and statistical techniques to solve some real life problems.

4) To gain knowledge of Mathematical and Statistical Computations.

Sr.No.	Topic	No. of Lectures
UNIT 1	**Solution of Non linear Equations** 1.1 Introduction 1.2 Bisection method-without derivation and convergence 1.3 Newton-Raphson Method-without derivation & convergence.	4
UNIT 2	**Interpolation** 2.9 Introduction 2.10 Difference Operators-Forward , Backward , Shift (E), Relations between them. 2.11 Forward & backward Difference tables. 2.12 Factorial Notation 2.13 Newton's Forward Difference & Backward Difference interpolation formulae (without proof) 2.14 Lagrange's formula for interpolation with unequally space points. (without proof)	1
UNIT 3	**Numerical differentiation, Integration & Solutions of Ordinary Differential Equations.** 3.1 Introduction 3.2 Numerical Differentiation. 3.3 Numerical Integration-A General Quadrature formula for Equidistance Ordinates, The Trapezoidal rule, Simpson's $1/3^{rd}$ rule, Simpson's $3/8^{th}$ rule. 3.4 Picard's Method of successive approximations. 3.5 Euler's & Modified Euler's Method. 3.6 Runge Kutta Method (Second and fourth order).	1

UNIT 4	**Time Series** 4.2 Meaning and utility 4.3 Components of time series 4.4 Additive and multiplicative models 4.5 Methods of estimating trend by graphical method, ratio method, moving averages method of least squares for linear trend and exponential smoothing method 4.6 Concept of Auto regressive models, first order autoregressive model AR(1) 4.7 Examples and problems.	2
UNIT 5	**Control Structures** 5.2 Concept of Probability 5.3 Probability density function of 5.3.1 Normal distribution with mean 'm' and variance and σ^2 5.3.2 Standard normal variate (SNV) 5.4 Properties of normal distribution (without proof). 5.5 Additive property of two independent normal variates (without proof). 5.6 Problems to evaluate probabilities and to find mean and variance. 5.7 Examples and problems.	6
UNIT 6	**Testing of hypothesis** **Large sample Tests** 6.6 Concept of hypothesis, statistical hypothesis, null hypothesis, alternative hypothesis, two types of errors, level of significance, test of significance. 6.7 Concept of a large sample test for testing 6.2.1 $H_0 : M = M_0$ v/s $H_A : M \neq M_0$ 6.2.2 $H_0 : M_1 = M_2$ v/s $H_A : M_1 \neq M_2$ 6.2.3 $H_0 : P = P_0$ v/s $H_A : P \neq P_0$ 6.2.4 $H_0 : P_1 = P_2$ v/s $H_A : P_1 \neq P_2$ 6.3 Examples and problems **Small Sample Test** 6.4 Chi-square test of goodness of fit 6.5 Chi-square test of independence of two attributes a. 2×2 contingency table b. $m \times n$ contingency table 6.6 t-test for $H_0 : M = M_0$ v/s $H_A : M \neq M_0$ t -test for $H_0 : M_1 = M_2$ v/s $H_A : M_1 \neq M_2$ 6.7 paired t test.F - test for $H_0 : \sigma_{12} = \sigma_{22}$ v/s $H_A : \sigma_{12} \neq \sigma_{22}$ 6.8 Examples and problems	6

Recommended Books :

1) S.S.Sastry
   Introductory Methods of Numerical Analysis

2) V.Rajaraman
   Computer Oriented Numerical Methods

3) E.Balagurusamy
   Numerical Methods

4) H.C.Saxena
   Finite Difference and Numerical Analysis

5) S.C. Gupta
   Fundamentals of Statistics

6) J.S Chandran
   Statistics for Business and Economics

7) S. P Gupta
   Statistical Methods

8) S.C Gupta, Gupta Indra
   Business Statistics

9) Amir D Aczel, Jayavel Sounderpandian
   Complete Business statistics

10) D.N. Elhance
    Fundamentals of Statistics

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M.C.A.Commerce Sem - I

Subject: Operating System (105)

Objectives:

The goal of this course is to provide an introduction to the internal operation of modern operating systems. In particular, the course will cover processes, mutual exclusion, CPU scheduling, deadlock, memory management, and file systems.

Sr.No.	Topic	No. of Lectures
UNIT 1	Introduction to Operating System 1.1 What is an Operating System? 1.2 Simple Batch Systems 1.3 Multiprogrammed Batched Systems 1.4 Time Sharing 1.5 Parallel Systems 1.6 Disturbed Systems 1.7 Real time systems	3
UNIT 2	Computer-System Structures 2.1 Computer system operations 2.2 I/O structure 2.3 Storage structure 2.4 General system architecture	3
UNIT 3	Operating System Structures 3.1 System components 3.2 Operating system services 3.3 System calls 3.4 System programs 3.5 Virtual machines	4
UNIT 4	Process management 4.1 Process concept 4.2 Process scheduling 4.3 Operation in process 4.4 Cooperating Processes	4
UNIT 5	CPU Scheduling 5.1 Basic concepts 5.2 Scheduling criteria 5.3 Scheduling algorithms	5

UNIT 6	Process Synchronization 6.1 Background 6.2 The critical-section problem 6.3 Semaphores 6.3.1 Classical Problems of Synchronization	5
UNIT 7	Deadlocks 7.1 System model 7.2 Deadlock characterization 7.3 Method of handling Deadlocks 7.4 Deadlock prevention 7.5 Deadlock avoidance 7.6 Deadlock detection 7.7 Recovery from Deadlock	5
UNIT 8	Memory Management 8.1 Background 8.2 Logical versus physical address space 8.3 Swapping 8.4 Contiguous allocation 8.5 Paging 8.6 Segmentation 8.7 Segmentation with paging	8
UNIT 9	Virtual memory 9.1 Background 9.2 Demand paging 9.3 Page replacement 9.4 Page replacement algorithms 9.5 Thrashing	6
UNIT 10	File System interface 10.1 File concept 10.2 Access methods 10.3 Directory structure 10.4 Protection	2
UNIT 11	File System Implementation 11.1 File System Structure 11.2 Allocation Methods 11.3 Free Space Management	2
UNIT 12	I/O Systems 12.1 I/O hardware 12.2 Application I/O interface 12.3 Kernel I/O subsystem.	2

Recommended Books :

1) Operating System Concepts - Gilberschatz , Galvin, Addison wisely Newyork
2) System Programming and Operating System - D M Dhamdhere, Tata McGraw-Hill Publication

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M.C.A.Commerce Sem - I

Subject: Software Engineering (106)

Objectives:

1) Facilitate an understanding of the software development lifecycle, and the engineering practices that define it
2) To help students to develop skills that will enable them to construct software of high quality - software that is reliable, and that is reasonably easy to understand, modify and maintain

Sr.No.	Topic	No. of Lectures
UNIT 1	Introduction to system concepts 1.8 Introduction to system 1.9 Characteristics of system 1.10 Elements of system 1.11 Types of system 1.12 Categories of information system	4
UNIT 2	Software Development Approaches 2.1 SDLC 2.2 Waterfall model 2.3 Prototyping model 2.4 Spiral model 2.5 4GL 2.6 System analysis	7
UNIT 3	Structured System Analysis and Design Tools and Techniques 3.1 Feasibility Study 3.2 Fact finding techniques 3.3 Decision tree & decision tables 3.4 Structured English 3.5 Data flow diagram 3.6 Data dictionary	10
UNIT 4	Database Design Methods 4.1 ER - analysis 4.2 Normalization 4.3 Input - Output design 4.4 Structure chart	7
UNIT 5	System Testing 5.1 Testing & debugging definition 5.2 Testing objectives & principles 5.3 Testing strategies 5.4 Test data generators	4

UNIT 6	System Implementation 6.1 Implementation Strategies 6.2 Steps of Implementation 6.3 Post Implementation review	6
UNIT 7	System Maintenance 7.1 Importance of Maintenance 7.2 Software Maintenance 7.3 Types of Maintenance 7.4 Controlling factors of Maintenance 7.5 Reverse engineering 7.8 Re-engineering	6
UNIT 8	Quality Standards 8.1 Software quality 8.2 Tuning & optimization 8.3 ISO standards 8.4 Capability maturity model	6

Recommended Books :

1. Analysis & design of information System :- James Seann.
2. Software Engineering :- Pressman, Tata McGraw-Hill Publication, Delhi.
3. System Analysis & design :- Parthasarty ,Khalkar, Master education Consultants, Nashik.
4. System Analysis & design :- Awad, Galgotia Publication
5. System Analysis & design :- Senn, Tata McGraw-Hill Publication, Delhi

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M.C.A.(Com.) Sem - II

Subject: Business Protocol & Cross Cultural Communication Skills (201)

Objectives:

1. To help the students for developing a strong foundation for communication.
2. To make them aware of the importance of business protocol & communication.

Sr.No.	Topic	No. of Lectures
UNIT 1	Introduction to communication Meaning & definition, Process, function, objective, importance, essentials of good communication, cross culture communication, Need to understand cross culture communication studies.	12
UNIT 2	Corporate Communication Formal & informal communication networks, practices in business communication - Group discussions, Mock interviews, seminars, effective listening exercises, individual & group presentation & report writings	12
UNIT 3	Business Protocol - Meaning, scope & importance - Etiquette - Meaning, Importance, Basic principles of etiquette, International etiquette - Role of business protocol & body language in an organization	12
UNIT 4	International Communication - Understanding culture, cultural sensitiveness & cultural context. Intercultural factors in communication, Adopting to Global business.	12

Recommended Books :

1) Cross Culture Mgt. - by Ray French - Universities Press

2) Communication - by C.S.Rayudu - Himalaya Publishing

3) Business Communication - by Meenakshi Raman & Prakash Singh - Oxford

4) Basics of Business Communication - by Lesikar & Flately - Tata McGraw Hill

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M.C.A.(Com.) Sem - II

Subject: Relational Database Management System (202)

Sr.No.	Topic	No. of Lectures
UNIT 1	BASIC CONCEPTS 1.13 Database-system Applications 1.14 Purpose of database Systems 1.15 View of data 1.16 Database Languages 1.17 Relational databases 1.18 Database design 1.19 Database architecture	3
UNIT 2	Relational model 2.7 Structure of Relational databases 2.8 Fundamental Relational-Algebra Operations 2.9 Additional Relational-Algebra Operations 2.10 Extended Relational-Algebra Operations	4
UNIT 3	SQL 3.7 Background 3.8 Data definition 3.9 Basic structure of SQL queries 3.10 Set operations 3.11 Aggregate Functions 3.12 Null values 3.13 Nested sub-queries 3.14 Complex queries 3.15 Views 3.16 Modification of the database 3.17 Join relations	6
UNIT 4	Advanced SQL 4.5 SQL data types and schemas 4.6 Integrity constraints 4.7 Authorization 4.8 Embedded SQL 4.9 Dynamic SQL	7
UNIT 5	Database Design And ER-Model 5.5 Oerview of the design process 5.6 The entity relationship model 5.7 Constraints 5.8 Entity relationship diagrams	6

	5.9 Entity relationship design issues 5.10 Weak Entity sets 5.11 Extended E-R features	
UNIT 6	Relational Database Design 6.4 Features of good Relational Designs 6.5 Atomic Domains and first Normal form 6.6 Decomposition using functional Dependencies 6.7 Functional Dependency theory 6.8 Decomposition using functional dependencies 6.9 Decomposition using multivalued 6.10 Dependencies	7
UNIT 7	Transaction Management 7.1 Transaction concept 7.2 Transaction state 7.3 Implementation of Atomicity and Durability 7.4 Concurrent Execution 7.5 Serializability 7.6 Recoverability 7.7 Implementation of Isolation 7.8 Testing for Serializability	6
UNIT 8	Concurrency Control 8.1 Lock based protocols 8.2 Timestamp based protocols 8.3 Multiple Granularity 8.4 Validation based protocols 8.5 Deadlock Handling	6
UNIT 9	Recovery System 9.1 Failure Classification 9.2 Storage Structure 9.3 Recovery and Atomicity 9.4 Log based Recovery 9.5 Recovery with Concurrent Transaction	5

Recommended Books :

1. Database System Concepts :- Silberschatz , Korth , Tata McGraw-Hill Publication
2. An Introduction to Database Systems :- Bipin Desai, Galgotia Publication
3. Database Management System :-Raghu Ramkrishnan, Tata McGraw-Hill Publication
4. SQL, PL/SQL The Programming Language Oracle :- Ivan Bayross, BPB Publication.

Master of Computer Application (Commerce)
(M.C.A.)

Sem-II **Course Code: 203**

Course Title : Cost Accounting and Cost Control Techniques

Objectives: To Impart the Knowledge of

1) Basic cost concepts, Element of cost, Preparation of Cost Sheet and Accounting of Overheads.
2) To provide basic knowledge of important Methods & Techniques of costing.

Level of Knowledge : Basic understanding of the subject and its Application.

Units	Topics	Periods
Unit 1:	**Introduction**	**4**
	1.1. Concept of cost, costing, cost Accounting & Cost Accountancy.	
	1.2. Limitations of Financial Accounting.	
	1.3. Advantages and Limitations of Cost Accounting.	
	1.4. Difference between Financial and Cost Accounting.	
	1.5. Cost Unit & Cost Centre.	
Unit 2	**Elements of Cost**	**4**
	2.1. Elements of Cost - Material, Labour and Expenses.	
	2.2. Classification of cost & Types of Costs	
	2.3. Preparation of Cost Sheet.	
Unit 3:	**Accounting of Overheads**	**12**
	3.1. Meaning and Definition of Overhead	
	3.2. Classification of Overheads	
	3.3. Collection, Allocation, Appointment and Re-appointment of overhead	
	3.4 Overhead Absorption - Meaning overheads rates, Methods of overhead Absorption.	
	3.5. Under and Over Absorption of Overheads. Meaning, Reasons, Accounting Treatment.	
Unit 4:	**Methods of Costing**	**14**
	4.1. Job Costing - Meaning, Features, Advantages and Limitations	
	4.2. Contract Costing - Basic Concepts	
	4.3. Process Costing - Meaning, Features, Normal and Abnormal Loss/ Gains	
	4.4. Operating Costing - Meaning, Features &Objectives (Transport Undertaking only)	

Unit 5: Techniques of Costing **14**

5.1. Budget and Budgetary Control- Definition, Meaning , Objectives, Advantages and disadvantage of Budgetary Control
- Types of Budget

5.2. Marginal Costing - Meaning and Various Concepts
- Fixed Cost, Variable Cost, Contribution, P/V Ratio, Break Even Point, Margin of Safety.
Application of Marginal Costing - Shut Down, Product/Sales Mix, Acceptance or rejection of foreign order and Key factor only

5.3. Standard Costing- Definition and Meaning of Various Concepts
- Advantages and Limitations of Standard Costing
- Variance Analysis - Material, labour and Overhead Variances only

Total Periods 48

Area of Practical Problems:

1) Cost Sheet

2) Methods of Costing

I) Contract Costing - Contract Account and Contractee Account

II) Process Costing (Simple Problems)
III) Operating Costing (Transport Undertaking Only)

3) Techniques of Costing
I) Marginal Costing and its Application
II) Budget and Budgetary Control - Flexible and Cash Budget
III) Standard Costing - Material and Labour Variances only

Allocation of Marks:

Theory - 40% Practical Problems - 60%

Assignment:-
Costing in Software industry, Manufacturing industry & Service industry.

References:

1.	Prof. Subhash Jagtap	-	Practice in Advanced costing and Management Accounting. Nirali Prakashan - Pune
2.	Ravi Kishor	-	Advanced Cost Accounting and Cost Systems Taxman's Allied Service Pvt. Ltd., New Delhi.
3.	S.P. Lyengar	-	Cost Accounting Principles and Practice, Sultan Chand & Sons Accounting Taxman's, New Delhi.
4.	M.N. Arora	-	Cost Accounting Principles and Practice Vikas Publishing House Pvt. Ltd., New Delhi.
5.	S.N. Maheshwari and S.N. Mittal	-	Cost Accounting, Theory and Problems, Mahavir book Depot, New Delhi.
6.	B.L. Lall and G.L. Sharma	-	Theory and Techniques of Cost Accounting. Himalaya Publishing House, New Delhi.
7.	V.K. Saxena and Vashista	-	Cost Accounting - Text book. Sultan Chand and Sons - New Delhi
8.	Jain and Narang	-	Cost Accounting Principles and Practice. Kalyani Publishers
9.	N.K. Prasad	-	Principles and Practice of Cost Accounting Book Syndicate Pvt. Ltd., Calcutta.
10.	R.K. Motwani	-	Practical Costing. Pointer Publisher, Jaipur
11.	R.S.N. Pillai and V. Bhagavati	-	Cost Accounting.
12.	Hornefgrain and Datar	-	Cost Accounting and Managerial Emphasis.
13.	Journal	-	1. Cost Accounting Standards Issued by ICWA of India, Calcutta.
		-	2. Management Accountant Issued by ICWA of India, Calcutta.
14.	Website	-	icwaijournal@hotmail.com www.myicwai.com.

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M.C.A. Sem - II

Subject: Accounting for Management (204)

Sr.No.	Topic	No. of Lectures
UNIT 1	INTRODUCTION Management Accounting - Meaning and Definition, Characteristics, Objectives, scope and functions of Management Accounting- Financial Accounting, Cost Accounting and Management Accounting-- Tools and Techniques of Management Accounting- Advantages and Limitations of Management Accounting -Installation of Management Accounting System- Management Accountant: functions and duties - Essential qualities.	6
UNIT 2	FINANCIAL STATEMENT ANALYSYS Introduction-objectives of analysis of financial statementtools of financial statement analysis-Multi -step income statement, Horizontal analysis, Common sized analysis, Trend analysis, Analytical Balance Sheet.	4
UNIT 3	RATIO ANALYSIS Ratio Analysis-Meaning and rationale, advantages and limitations. Types of Ratios Liquidity Ratios, Solvency Ratios, Profitability Ratios, Efficiency Ratios, Integrated Ratios.	8
UNIT 4	**FUND FLOW AND CASH FLOW STATEMENT** Meaning of Fund flow statement -Uses of fund flow statement, Funds Flow Statement and Income Statement. Preparation of Funds Flow Statement. Meaning of Cash flow statement- Preparation of Cash Flow Statement. Difference between Cash Flow Analysis and Funds Flow Analysis. Utility of Cash flow Analysis. Limitations of Cash Flow Analysis.	12
UNIT 5	MARGINAL COSTING Meaning of Marginal Cost and Marginal Costing, advantages, limitations. Fixed and Variable cost, Contribution, Break-even analysis, Application of marginal costing in Managerial Decision Making	10
UNIT 6	BUDGET AND BUDTETORY CONTROL Meaning, Definition and scope of budget and budgetary control- Types of budgets - Financial budget - Master budget, Flexible budget - Capital budget.	8

Recommended Books :

1) R. N. Anthony , G. A. Walsh: Management Accounting
2) Horngren: Introduction to Management Accounting (Pearson)
3) M. Y. Khan. K. P. Jain: Management Accounting
4) I. M. Pandey: Management Accounting (Vikas)
5) Sr. K. Paul: Management Accounting
6) Dr. Jawaharlal: Managerial Accounting
7) Man Mohan Goyal: Management Accounting
8) S. N. Maheshwari: : Accounting For Management
9) R. K. Sharma and Shashi K. Gupta: Management Accounting

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M.C.A. Sem - II

Subject: Networking Operations (205)

Sr.No.	Topic	No. of Lectures
UNIT 1	Basics of Computer Networks 1.1 Computer Network 1.1.1 Definition 1.1.2 Goals 1.1.3 Applications 1.1.4 Structure 1.1.5 Components 1.2 Topology 1.2.1 Types of Topology 1.3 Types of Networks 1.3.1 (LAN, MAN, WAN, Internet) 1.3.2 Broadcast & Point-To-Point Networks 1.4 Communications Types 1.4.1 (Synchronous ,Asynchronous) 1.5 Modes of Communication : 1.5.1 (Simplex 1.5.2 Half Duplex 1.5.3 Full Duplex) 1.6 Server Based LANs & Peer-to-Peer LANs (Comparison of both) 1.7 Protocols and Standards	10
UNIT 2	Network Models 2.1 Design issues of the layer 2.2 Protocol Hierarchy 2.3 ISO-OSI Reference Model : 2.3.1 Functions of each layer) 2.4 Terminology 2.4.1 SAP 2.4.2 Connection Oriented & connectionless services 2.4.3 Peer Entities 2.5 Internet Model (TCP/IP) 2.5.1 Layers, 2.5.2 Ports, Protocol Stack 2.6 Comparison of ISO-OSI & TCP/IP Model	7

UNIT 3	Transmission Media 3.1 Classes of Transmission Media 3.1.1 Guided Media(Wired) : 3.1.1.1 Coaxial Cable, Physical Structure, Standards, BNC Connector, Applications 3.1.1.2 Twisted Pair : Physical Structure,UTP Vs STP, Connectors, Applications. 3.1.1.3 Fiber Optics Cable : Physical Structure, Propagation Modes (Single Mode & Multimode), Fiber Sizes, Connectors , Applications , Advantages & disadvantages 3.1.2 UnGuided Media(Wireless) 3.1.2.1 Electromagnetic Spectrum For Wireless Communication 3.2 Propagation Methods 3.2.1 (Ground, Sky,Line-Of-Sight) 3.3Wireless Transmission 3.3.1 Radio Waves 3.3.2 Infra-Red, 3.3.3 Micro-Wave 3.4 Wireless LANs (IEEE802.11) Architecture 3.4.1 MAC Sublayer 3.4.2 Frame Format 3.4.3 Frame Types 3.5 Bluetooth 3.5.1 Architecture (Piconet, Scatternet, Bluetooth Layers) 3.5.2 Applications	12
UNIT 4	Network Connectivity Devices 4.1 Categories of Connectivity Devices 4.1.1 Passive & Active Hubs 4.1.2 Repeaters 4.1.3 Bridges (Transparent Bridges, Spanning Tree, Bridges, Source Routing Bridges) 4.1.4 Switches (2-Layer Switch, 3-Layer Switch(Router) 4.1.5 Gateways 4.1.6 Network Security Devices (firewalls , Proxy Server)	5

UNIT 5	Components of LAN 5.1 Network Interface Cards(NIC) 5.2 Network Adapters 5.2.1 Components of NIC 5.2.2 Functions of NIC 5.2.3 Types of NIC (Ethernet, ARCNET, Token Ring) 5.2.3.1 Ethernet : Basic Features, Types, Cable, Topologies, IEEE 802.3, IEEE 802.4, IEEE 802.5 Frame format)	4
UNIT 6	Internet Basics 6.1 Concept of Intranet & Extranet 6.2 Internet Information Server(IIS) 6.3 Web Server 6.4 World Wide Web(WWW) Architecture, Web Documents 6.5 Search Engines 6.6 Internet Service Providers(ISP)	2

Recommended Books :

1. Computer Networks - Andrew Tanenbaum (III Edition)
2. Data Communications & Networking - Behrouz Ferouzan (III Edition)
3. Complete Guide to Networking - Peter Norton

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M.C.A.(Com.) Sem - II

Subject: Object oriented programming Using C++ & Java (206)

Sr.No.	Topic	No. of Lectures
UNIT 1	An introduction & overview of C++ 1.20 object oriented programming paradigm 1.21 basic concepts of OOPs 1.22 Benefits of OOPs	3
UNIT 2	Token Expressions & control Structures 2.11 Tokens, keywords, identifiers, constants, data types, variables , operators & typecasting 2.12 Symbolic constants 2.13 Reference variables 2.14 Scope resolution operators 2.15 Memory management operators 2.16 Manipulators 2.17 C++ console I/O	4
UNIT 3	Functions in C++ 3.18 Function prototyping, call by reference, return by reference 3.19 Inline Functions 3.20 Function overloading 3.21 Friend Function	5
UNIT 4	Classes & objects 4.10 C++ console I/O, Header files, Specifying a class, defining member functions 4.11 A C++ program with class 4.12 Array within a class 4.13 Static data members & Static member functions 4.14 Arrays of objects 4.15 Objects as function arguments	5
UNIT 5	Constructors & Destructors 5.12 Introduction 5.13 Types of constructors 5.14 Destructors	4
UNIT 6	Operator overloading 6.11 overloading unary operators 6.12 Overloading binary operators 6.13 Overloading relational & logical operators	5

UNIT 7	Inheritance 7.9 Types of Inheritance 7.10 Base class access control 7.11 Constructors & Destructors, & Inheritance 7.12 Virtual base classes	7
UNIT 8	Introduction to Java 8.8 Structure of Java program 8.9 Compilation and execution of Java Program 8.10 Data Types 8.11 Arrays 8.12 Type Casting	6
UNIT 9	Classes and Objects 9.6 Creating class and object 9.7 Memory allocation and deallocation for object 9.8 Constructors 9.9 Implementation of polymorphism 9.4.1 Method overloading 9.4.2 Method overriding 9.5 Use of static, super, this, final keyword.	6
UNIT 10	Inheritance 10.1 Implementation of inheritance(Simple, multilevel, hierarchical) 10.2 Introduction to interfaces 10.3 Creation and implementation of interfaces 10.4 Introduction to abstract classes and methods.	7

Recommended Books :

1. Object Oriented Programming with C++ , E.Balaguruswamy, Tata McGraw-Hill publication
2. Teach yourself C++ , Herbert Schildt
3. Object Oriented Programming with C++ , Robert Lafore, Techmedia publication
4. C++ complete reference , Herbert Schildt, Tata McGraw-Hill publication
5. Java Complete reference:- Herbert Schildt
6. Programming in Java:- Balguruswami