

UNIVERSITY OF PUNE
FACULTY OF MANAGEMENT

MCM-MCA BRIDGE PROGRAM
FOR
FULL TIME TEACHERS WORKING IN
MANAGEMENT INSTITUTES UNDER
PUNE UNIVERSITY

PROPOSAL

M.C.M. – M.C.A. BRIDGE PROGRAM LEADING TO M.C.A. DEGREE UNDER MANAGEMENT FACULTY

OBJECTIVES

The MCM program was run under University of Pune and also in some other universities. It was started in year 1990. Since then lot of students have completed their MCM degree and entered into teaching profession.

Large number of teacher has acquired MCM qualification of University of Pune. For advancing the technical knowledge of these teachers comparable with MCA Program, it is therefore felt necessary to introduce MCM-MCA bridge course for full time teachers having 3 years teaching experience. Similar type of MCM-MCA Bridge Program already been introduced by Shivaji University.

OUTLINE OF BRIDGE PROGRAM

MCM-MCA Bridge program will be of two semesters one year duration. Accordingly the syllabus structure has been prepared and the proposal is approved in Faculty of Management Studies.

The value addition thru this bridge program will be, 13 new subjects will be learnt by the teachers and their knowledge in the field of computers will be at par with MCA..

The program will be conducted by University with the help of one of the recognized institute to be selected by the university authorities.

ELIGIBILITY

The eligibility criteria will be:

Candidate must have passed MCM degree with First Class from Pune University and working in management institute under Pune University for 3 years or more as full time teacher.

INTAKE

TOTAL NUMBER OF SEATS : 60

The candidate possessing above eligibility should apply to the university designated institute. The selection of the candidate for the course will be done on the basis of Group Discussion (GD) and Personal Interview (PI) conducted by the university designated institute.

ASSESSMENT

The final total assessment of the candidate is made in terms of an internal assessment and an external assessment for each course.

1. For each paper, 30% marks will be based on internal assessment and 70% marks for semester and examination (external assessment), unless otherwise stated.
2. The division of the 30 marks allotted to internal assessment of theory papers is on the basis of tutorial paper of 15 marks and seminars, presentations and attendance of 15 marks.
3. The marks of the practical would be given on internal practical exam and oral.
4. The departmental papers examination will be conducted by department.

EXAMINATION

Examinations shall be conducted at the end of the semester. Since this is special course, examination will be conducted by the institute designated by university authority as per Circular No.225.

STANDARD OF PASSING:

1. Internal as well as external examination will be held at the end of semester. Every candidate must secure 40% marks in internal as well as external Examination.

2. Reassessment of Internal Marks:

In case of those who have secured less than passing percentage of marks in internal i.e. less than 40% , the department will administer a separate internal test. In case the result of the revised internal test is lower than the original marks then the original marks will prevail. In short, the rule is higher of the two figures should be considered. However, the department will not administer any internal test, for any subject for those candidates who have already secured 40% or more marks in the internal examination.

BOARD OF PAPER SETTERS /EXAMINERS:

For each Semester and examination there will be one board of Paper setters and examiners for every course. While appointing paper setter /examiners, care should be taken to see that there is at least one person specialized in each unit course.

CLASS:

There shall be numerical marking for each question .At the time of declaration of the result, the marks obtained by a candidate out of total 1400 is converted into classes as shown below:

Class	Total Marks
First Class with Distinction	980 and above
First class	840 to 979
Higher Second Class	770 to 839
Second Class	700 to 769
Pass Class	560 to 699
Fail	559 and below

MEDIUM OF INSTRUCTION:

The medium of Instruction will be English.

TEACHING AND PRACTICAL SCHEME:

Each session for teaching or practical should be of 90 minutes each. Teaching / practical sessions will be 40 sessions per subject.

NUMBER OF LECTURES AND PRACTICAL:

Lectures and Practical should be conducted as per the scheme of lectures and practical indicated in the course structure.

CONDUCT OF PROGRAM:

The sessions will be on Saturdays, Sundays, Holidays and in Vacation Period between 09:30 AM to 06:30 PM. If required, candidate may be called to attend extra sessions on any other day.

COURSE FEES :

- Since this is a career advancement program for the benefit of full time teachers, all the candidates are required to pay full fees, since this is a cost based program. The total fees will be Rs. 54,000/- for the course.
- The fees break-up will be as follows :

(a) Tution Fees	Rs. 30,000
(b) Admission Fees	Rs. 2,000
Identity Card Fees, Miscellaneous	
(c) University Fees including Eligibility, Student Welfare, Pro-rata etc.	Rs. 1,000
(d) Computer Laboratory Fees	Rs. 10,000
(e) Library Fees	Rs. 5,000
(f) Study Material	Rs. 4,000
(g) Seminar Fees	Rs. 2,000
TOTAL	Rs. 54,000

PROPOSED SYLLABUS FOR MCM-MCA BRIDGE PROGRAM

SEMESTER - I

SR.NO.	CODE	SUBJECT	TOTAL MARKS (Int 30 + Ext 70)
1	501	Quantitative Techniques with Presentation	(Dept. Paper 100 Marks)
2	502	Data Communication and Computer Networks	100
3	503	Object Oriented Programming Using C++	100
4	504	Operating System Concepts	100
5	505	Management Elective	100
6	506	Research Methodology and Statistical Tools	(Dept. Paper 100 Marks)
7	507	C++ Lab	100

SEMESTER-II

SR.NO.	CODE	SUBJECT	TOTAL MARKS (Int 30 + Ext 70)
1	601	Field Base Presentations on Upcoming Technologies	(Dept. Paper 100 Marks)
2	602	Design and Analysis of Algorithms	100
4	603	Advanced Database Management Systems	100
4	604	Human Computer Interface	100
5	605	Advanced Internet Technology	100
6	606	IT Elective	100
7	607	Mini Project (using Advanced internet technology Lab & HCI)	(Dept. Paper 100 Marks)

List of IT Elective Subjects:

Sr. No.	Subject Title	TOTAL MARKS
606-A	Programming Language paradigms	100
606-B	Advanced Unix	100
606-C	Mobile wireless computing	100
606-D	Distributed Database Management System	100

List of Management Elective Subjects:

Sr. No.	Subject Title	TOTAL MARKS
505-A	MIS Framework & Implementation	100
505-B	Information System Audit & Governance	100
505-C	Decision Support System	100
505-D	Enterprise Resource Planning	100

501- QUANTITATIVE TECHNIQUES WITH PRESENTATIONS

Objective : To introduce linear programming, dynamic programming and related optimization theories to solve real life / simulated problems.

Candidate will learn these quantitative techniques in the class and will solve the problems given to him as assignment will present it to the teacher along with the practical implementation of these techniques in real life problems.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	<p>Linear Programming Various definitions, statements of basic theorems and properties, Advantages, Limitations and Application areas of Linear Programming Linear Programming – The Graphical method – Graphical Solution methods of Linear Programming problem, Maximization Linear Programming problem, Minimization Linear Programming Problem. Linear Programming – Simplex Method</p>	15	5,8,6
2	<p>Queuing Theory Characteristics of Queuing Models. Transient and Steady states of the System. Model – I [(M/M/1) : (FCFS / ∞/∞)] Model II – Generalization of Model [(M/M/1) : (FCFS / ∞ / ∞)] (Birth- Death Process) [(M/M/1) : (FCFC / N/ ∞) (Finite Queue Length Model)</p>	8	2,5
3	<p>Inventory Theory Inventory Model Building, Single item deterministic Model, Inventory Control Models without shortages and Inventory Control Models with shortages.</p>	5	4,8

6	PERT & CPM Basic differences between PERT and CPM. Arrow Networks, time estimates, earliest expected time, latest – allowable occurrences time, Forward Pass Computation, Backward Pass Computation, Representation in Tabular Form Critical Path, Probability of meeting scheduled date of completion, Calculation on CPM network. Various floats for activities, Critical path updating projects. Operation time cost tradeoff Curve project, Time cost – tradeoff Curve- Selection of schedule based on Cost Analysis, Crashing the network	1 0	5,6,7,8
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References Books :

1. Introduction to Operation Research-A Computer Oriented Algorithm Approach Filet B. E.
2. Fundamental of Queuing Theory Gross D. and Ilaris C.M.
3. Introduction to Operation Research Hiller F and Lieberman G. J.
4. Mathematical Programming technique Kambo N.S.
5. Operations Research KantiSwarup, Gupta P.K. and ManMohan.
6. Optimization Methods in Operations Research and System Analysis Mital K.V.
7. The Critical Path Method Saffer L.R., Fitter J.B. and Meyer W.L.
8. Operation Research J.K. Sharma
9. Operation Research - Taha H.A.

502 – Data Communication and Computer Networks

Objective : Various computer networks, technologies behind networks and application protocols, e-mail and communication protocols will be introduced to students thru this subject.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	Introduction to Networking Hardware Architecture, Topologies, Media, Devices Transmission Technique , Twisted Pair, Coaxial Cable, Fiber optics, Wireless Transmission Switching Circuit Switching, Message Switching, Packet Switching	2	2
2	Common Network Architecture Connection oriented N/Ws Connectionless N/Ws Example of N/Ws-P2P, X.25, ATM, Ethernet Wireless LANs - 802.11, 802.11x, Gigabit	5	1
3	The OSI Reference Model Protocol Layering, TCP/IP Model, OSI vs. TCP/IP	2	2
4	Local Area Networks Components & Technology, Access Technique, Transmission Protocol & Media	2	5
5	Broad Band Networks Integrated Service Digital Networks (ISDN), Broad Band ISDN, ATM, ATM Traffic Mgmt, Introduction to very small Aperture Terminal (VSAT)	2	4
6	IP Addressing & Routing IP addresses – Network part and Host Part Network Masks, Network addresses and Broadcast addresses, Address Classes, Loop back address, IP routing concepts, Routing Tables, Stream & Packets What IP does? , What TCP does? Sliding Windows, TCP – a reliable pipe, TCP connection – Multiple conversations, Port Numbers, Multiple Connection from many hosts and one host IPV6: The next generation Protocol	8	5
7	Domain Network Services (DNS) Domain Names, Authoritative Hosts, Delegating	4	5

	Authority, Resource Records, SOA records, DNS protocol, DHCP & Scope Resolution		
8	Network Applications (HTTP, Email, etc) Hyper Text Transfer Protocol (HTTP) HTTP communications - HTTP request, Request Headers, Responses, Status Code, Error Status Code Email- Sending & Receiving Emails, Email Addressing, Message Structure MIME– Multipurpose Internet Mail Extensions SMTP– Simple Mail Transfer Protocol with examples Mail Exchangers – Delivering a message, Mail Boxes POP – Post Office Protocol IMAP – Internet Message Access Protocol FTP – File Transfer Protocol Telnet – Remote Communication Protocol Proxy Server, Proxy Web Servers	10	5
9	SNMP An IP Management Protocol Network Management protocols SNMP the Simple Network Management Protocol, Agents & Managers, SNMP organization, Object Identifiers, Problem with SNMP	2	3
10	Network Security Threats, Packet-filtering firewalls, Fire wall policies and rules, Common Problem with Packet Filtering, SSL – Secure Socket Layer, IPSec (Internet Protocol Security), Virtual Private Networks, Symmetric Key Signatures, Public key Signatures, The Birthday Attack	5	6

Reference Books:

- | | |
|---|-------------------------|
| 1. Computer Networks | Abndrew S. Tanenbaum 4e |
| 2. Network Essential Notes | GSW MCSE Study Notes |
| 3. Internetworking Technology Handbook | CISCO System |
| 4. Introduction to Networking and Data Communications | Eugene Blanchard |
| 5. Computer Networks and Internets with Internet Applications | Douglas E. Comer |

503-Object Oriented Programming Using C++

Objectives:

By the end of the course students will be able to write C++ programs using the more esoteric language features, utilize OO techniques to design C++ programs, use the standard C++ library, exploit advanced C++ techniques

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	Principle of OOP's Introduction Procedural Vs Object Oriented Programming Classes, Object, Data Abstraction, Encapsulation, Inheritance, Polymorphism Dynamic Binding, Message Passing Object Oriented Languages Object Based languages	2	1,3
2	Basics of C++ A Brief History of C & C++ C Vs C++ A Simple C++ Program Application of C++ Structure & Class Compiling & Linking	1	1,3
3	Expression Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Symbolic Constant, Type Compatibility, Reference Variables, Operator in C++, Scope Resolution Operator, Member De-referencing Operators, Memory Management Operators, Manipulators, Type Cast Operator	2	1,3
4	Functions In C++ The Main Function, Function Prototyping Call by Reference, Call by Address, Call by Value, Return by Reference Inline Function, Default Arguments Const Arguments, Function Overloading, Friend Function	2	1,2,3

5	Classes & Object A Sample C++ Program with class Defining Member Functions Making an Outside Function Inline Nesting of Member Functions Private Member Functions Arrays within a Class Memory Allocation for Objects Static Data Members, Static Member Functions, Arrays of Objects Object as Function Arguments Friendly Functions, Returning Objects, Const member functions Pointer to Members, Local Classes	4	1,3
6	Constructor & Destructor Constructor Parameterized Constructor Multiple Constructor in a Class Constructors with Default Arguments Dynamic Initialization of Objects Copy Constructor Dynamic Constructor Const Object Destructor	2	1,3
7	Operator Overloading & Type Conversion Defining operator Overloading Overloading Unary Operator Overloading Binary Operator Overloading Binary Operator Using Friends Manipulating of String Using Operators Type Conversion Rules for Overloading Operators	3	1,3
8	Inheritance Defining Derived Classes Single Inheritance Making a Private Member Inheritable Multilevel Inheritance Hierarchical Inheritance Multiple Inheritance, Hybrid Inheritance Virtual Base Classes, Abstract Classes Constructor in Derived Classes Nesting of Classes	3	1,3

9	Pointer, Virtual Function & Polymorphism Introduction Pointer to Object, This pointer Pointer to Derived Class, Virtual Function, Pure Virtual Function, Early Vs Late Binding	3	1,3,5
10	The C++ I/O System Basics C++ Streams, C++ Stream Classes Unformatted I/O Operation Formatted I/O Operation Managing Output with Manipulators	2	1,3,5
11	Working with Files Introduction Classes for File Stream Operation Opening & Closing Files Detection of End of File More about Open(): File modes File pointer & manipulator Sequential Input & output Operation Updating a File : Random Access Command Line Arguments	3	1,3,5
12	Template Generic Function, A function with Two Generic Data Types, Explicitly Overloading a Generic Function, Overloading a Function Template, Using Standard Parameter with Template Functions, Generic Function Restriction, Applying Generic Function : Generic Sort, Generic Classes, An Example with Two Generic Data Types Using Non-Type Arguments with Generic Class, Using Default Arguments With Template Classes, Explicit Class Specification, The typename & export keywords	2	1,3,5

13	Exception handling Exception Handling Fundamentals The try Block, the catch Exception Handler The throw Statements The try/throw/catch sequence Exception Specification Unexpected Exception Catch – All Exception Handlers Throwing an exception from handler Uncaught Exception	2	1,3,5
14	Introduction to Standard Template Library STL Programming Model, Sequence Container Adapter, Integrator Algorithms, Predicates, Allocators	2	1,6,3,5
15	Namespace Introducing Namespaces Referring to Members of a Namespace The using namespace Statement Defining A Namespaces Nested Namespaces Unnamed Namespaces Namespace Aliases	2	1,6,3,5
16	New Style Casts & RTTI New-Style Casts, dynamic_cast static_cast ,reinterpret_cast const_cast, Runtime Type Information (RTTI), A Simple Application of Run-Time Type ID, Ttypeid Can be Applied to Template Classes	2	1,6,3,5

Reference Books :

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|--|-----------------------------|
| 1.C++: The Complete Reference | Herbert Schildt |
| 2.Let us C++ | Kanetkar |
| 3.Object Oriented Programming with C++ | E. Balagurusamy |
| 4.C++ Primer | Stanley Lippman & Lajoi |
| 5.C++ Programming Language | Bjarne Stroustrup |
| 6.C++ Programming Bible | Al Stevens & Clayton Walnum |

504: Operating System Concepts

Objective : The core structure, functions and design principles of operating system will be introduced with this subject.

Sr. No.	Chapter Details	Sessions	Reference Books
1	Introduction 1.1 Logical View 1.2 User View, System Calls 1.3 Concept of Virtual Machine 1.4 Interrupt Concept	2	5 , 2.
2	Process Management 2.1 Process Concept 2.2 Process Control Block 2.3 Process Schedule algorithms 2.4 Process operations 2.5 Interprocess Communication 2.6 Communication in Client-Server	8	2.
3	CPU Scheduling 3.1 Scheduling Concept 3.2 Scheduling Criteria 3.3 Scheduling algorithms 3.4 Scheduling Evaluation 3.5 Simulation Concept	5	2.
4	Process Synchronization & Deadlock 4.1.Snchronisation concept 4.2.SychronisationRequirement 4.3 Critical Section Problem 4.4 Monitors 4.5 Deadlock concepts 4.6 Deadlock prevention & avoidance 4.7 Deadlock Detection 4.8 Deadlock Recovery	7	2.

5	Memory Management 5.1 Concept 5.2 Memory Management Techniques 5.3 Contiguous & Non Contiguous allocation 5.4 Logical & Physical Memory 5.5 Conversion of Logical to Physical address 5.6 Paging, Segmentation 5.7 Segment with paging 5.8 Virtual Memory Concept 5.9 Demand paging 5.9.1 Page Replacement algorithm 5.9.2 Allocation of Frames 5.9.3 Page fault	7	5, 2.
6	File management 6.1 File Structure 6.2 Protection 6.3 FILE system Implementation 6.4 Directory structure 6.5 Free Space Management 6.6 Allocation Methods 6.7 Efficiency & Performance 6.8 Recovery	6	1, 2 ,4.
7	Disk Management 7.1 Disk Structure 7.2 Disk Scheduling algorithm 7.3 Disk management 7.4 Swap Space concept and Management 7.5 RAID structure 7.6 Disk performance issues	4	2.

8	Distributed Operating System 8.1 Difference Between Distributed & Centralized OS 8.2 Advantages of Distributed OS 8.3 Types of Distributed OS 8.4 Concept of Global OS 8.5 NOS Architecture	8	1 , 2 ,3
9.	Features of different OS Integration of OS	2	Unleashed versions are useful

Reference Books :

1. Operating System : Achyut Godbole
2. Operating System : Galvin
3. System Programming & OS : D.M. Dhamdhare
4. Red Hat Bible Core Fedora Linux : Christopher Negus (Wiley Pub.)
5. Operating System : Andrew Tanenbaum

505-A MIS Framework And Implementation

Objective : To know MIS framework and methodologies, socio-economic environment and MIS impact, critical success factors and implementation aspects of MIS.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	1.1 Discuss a variety of framework for identifying IT applications. The scope of IT applications would cover Management Information System, Decision Support System, Executive Information System and Expert System.	8	1,2
2	2.1 Provide broad understanding of the types of the benefits information technology applications can provide in an organization through transaction processing, management and operational control decision support system, office automation, organizational communications and group work support.	10	1,2
3	3.1 Socio-economic environment and information systems in organization and the impact. And impact of Information systems on Organization's markets, frameworks of Information systems planning information system and competitive advantage 3.2 The new strategic role of Information systems , methodologies for evaluating investments in IT 3.3 Framework and methodologies should be discussed and illustrated with case Studies	12	1,2
4	4.1 Critical success factor in implementing IT applications including the lead for managing IT process of change, illustrated through case studies 4.2 Study of successful / failed IT projects. 4.3 Critical role of security in implementing IT application should be discussed.	10	1,2

References Books :

1. Business Information Systems
2. Website links : www.misframework.com

505-B : Information System Audit and Governance

Objective : To learn IS audit methods, controls, IS strategies through case studies.

Prerequisites: IT fundamentals , Computer operations , Network concepts , and Internet concepts, Exposure to programming languages , Exposure to SSAD and Database concepts, Commercial Applications, Management Concepts and Practice

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	Auditing concepts ISA need, concept, standards, performance, steps , techniques , methodologies , around and through computer	3	1,2,3
2	Controls – Concept objectives, types, risk, exposure	2	2,3
3	IT environment – hardware, system software, OS, DBMS, Infrastructure, network concepts, Personnel, documentation, review of performance, procurement, and other controls	3	2,4
	Network concepts, LAN, WAN, Client-Server architecture, Internet, EDI, e-mail, encryption, digital signatures –review of performance, procurement and other controls.	5	2,3,4
4	Software procurement and development – SDLC – Meaning and IS auditor's role-traditional SSAD , OOM , prototyping , 4GL , project management , testing , implementation review.	4	2,1
5	IS-operations -planning, organizing, scheduling, SCM, problem management , record management, QA and QC , review and controls	3	2,3
6	Controls – Input , process , validation , output, logical access, physical access , database , network , environment , BCP	8	2,4
7	Evidence collection, evaluation and reporting methodologies	2	2,5,1
8	IS strategies and management – organization structure , long term and short term plans , steering and other committees , HR policies , segregation of duties	2	2,4

9	IT crimes , viruses , security , privacy issues	2	2,3
10	Broad introduction to concepts and practice of e-commerce and legal framework for e-commerce	2	
11	Case studies and assignments	4	2,3

Reference Books :

1. Names of ISA related material is given. For all other IT related topics, e.g. EIT , SSAD , DBMS , Network etc various standard books are available in the market and also recommended by the University.
2. EDP Auditing Conceptual Foundations And Practices” by Ron Weber – McGraw-Hill publication
3. Latest CISA review manual by ISACA , USA – This may be procured by individual institutes and made available to students on library basis
4. IS audit standards and control objectives of ISAXA which are non-copyrighted and relevant , refer www.isaca.org
5. IS control journals from ISACA

Note :

1. Two case studies and two assignments need also be covered.
2. The syllabus is expected to be completed within approx 40 sessions of 90 minutes each.
3. Many topics will have to be covered at a broad level only.
4. Role of IS auditor and relation of each topic to ISA controls and review should be part of all lectures.
5. Emphasis should be on Audit , security, control, review and documentation aspects and usage of relevant standards as relevant to all the IT facets.

505-C : Decision Support Systems

Objective : To learn DSS, DSS Tools, DSS implementation and impacts and Enterprise DSS.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	Decision Support Systems-An Overview 1.1 Decision Support Systems (DSS) Concept 1.2 DSS : Deterministic Systems 1.3 Artificial Intelligence 1.4 Knowledge Based Expert Systems 1.5 MIS and Role of DSS	5	1,2
2	Data warehouse , Access , Analysis , Mining and Visualization for DSS 2.1 Data warehousing , access ,analysis and visualization 2.2 Data collection problems and quality 2.3 Internet and commercial database service 2.4 Database Mgt System for DSS 2.5 Database organization structure for DSS 2.6 Data warehousing 2.7 OLAP 2.8 Data mining 2.9 Data Visualization 2.10 GIS and virtual reality 2.11 Business Intelligence	10	1,2
3	DSS Development 3.1 Introduction to DSS development 3.2 Traditional system development life cycle 3.3 Alternate development methodologies 3.4 Prototyping :DSS Methodology	8	1,2
4	Tools for DSS development 4.1 DSS Technology levels and tools 4.2 DSS development platform 4.3 DSS development tools selection 4.4 Team – developed DSS 4.5 End user Developed DSS 4.6 Development of DSS : Putting system together 4.7 DSS future	10	1,2

5	Enterprise Decision Support System 5.1 Enterprise system : Concept and definition 5.2 Evolution of executive and enterprise information system	5	1,2
	5.3 Characteristics and capabilities of ESS 5.4 Comparing and integrating EIS and DSS 5.5 EIS , data access, data warehousing, OLAP , multidimensional analysis, presentation 5.6 Including soft information in enterprise systems 5.7 Organizational DSS 5.8 Supply and value chain and decision support 5.9 Computerized systems – MRP , ERP , SCM 5.10 Frontline DSS 5.11 Future of DSS and EIS		
6	Implementation , integration and impacts 6.1 Implementation : an overview 6.2 The major issues of implementation 6.3 Implementation strategies 6.4 System Integration: What and Why? 6.5 Generic models of MSS integration 6.6 Models of ES and DSS integration 6.7 Integration of EIS , DSS and ES 6.8 Intelligent DSS 6.9 Intelligent modeling 6.10 Examples of integrated systems	5	1,2

Reference Books :

1. Decision Support Systems and Intelligent systems by Efrain Turbon
2. Management Information Systems by W S Jawadekar

505-D : Enterprise Resource Planning

Objective : To learn ERP systems its structure, modules, benefits, implementation and post implementation issues thru real-life cases.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	Enterprise Resource Planning Introduction What Is ERP? Need of ERP. Advantage of ERP Growth of ERP	4	1
2	ERP and related technologies Business Process Re-Engineering (BPR) Management Information System (MIS) Decision Support System (DSS) Executive Support System (ESS) Data Warehousing, Data Mining On-Line Analytical Processing (OLAP) Supply Chain Management Customer Relationship Management	20	2
3	ERP Modules and Vendors Finance Production Planning, Control and Management Sales and Distribution Human Resource Management Inventory Control System Quality Management ERP market	6	2
4	ERP Implementation Life Cycle Evaluation and selection of ERP package Project planning, Implementation, Team Training and Testing End User Training and Going Live Post Evaluation and Maintenance	5	3
5	ERP Case Studies Post Implementation review of ERP packages in manufacturing, Services and Others Organizations	5	3

Reference Books :

- | | |
|---|----------------------------------|
| 1. Enterprise Resource Planning | Alexis Leon |
| 2. ERP Ware: ERP Implementation Framework | V.K. Garg &N.K. Venkita Krishnan |
| 3. ERP Concepts & Planning | V.K. Garg &N.K. Venkita Krishnan |

506 : Research Methodologies & Statistical Tools

Objective:

Research is a tool which helps the manager to identify, understand and solve management problems. Research improves the decision making ability of the manager. The objective of the subject is to create scientific attitude towards solving a management problem and impart knowledge about tools available for carrying out research.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
Section I: Research Methodology			
1	Meaning, Objectives and Motivation in Research, types of Research, Research Approaches, Research Process, Validity and Reliability in Research, Obstacles in accepting research.	2	1,3,4
2	Problem Formulation, Hypothesis Formulation, types of Hypothesis, characteristics of Good Hypothesis	2	1,3,4
3	Meaning and Significance of Research Designs, Features of a good research design, types of research design, contents of research design	2	1,3,4
4	Census Vs. Sample. Steps in Sample Design. Determining the size of Sample. Sampling methods - Simple Random Sampling, Stratified Sampling, Systematic Sampling, Cluster Sampling, Selective Sampling.	3	1,3,4
5	Types of Data, Sources of Data – Primary and Secondary Data. Methods of collecting the data. Testing the validity of the data.	2	1,3,4
6	Measurement and scaling techniques, errors in measurement, tests of sound measurement, scaling and scale construction techniques	1	1,3,4
7	Steps in Questionnaire design, characteristics of a good questionnaire	1	1,3,4

8	Presentation, Processing & Analysis and Interpretation of Data.	2	1,3,4
9	Report Writing – layout of a Research Report, Characteristics of a good research report.	2	1,3,4
Section II : Statistical Tools			
10	Measures of Central Tendencies and	4	2
12	Association of Attributes – 2 Attributes Only	2	2
13	Testing of Hypothesis, Large Sample Tests, Small Sample Tests – t, F tests. χ^2 tests.	6	2
14	Simulation Techniques To conduct a small research project in group and apply the knowledge about research methodology	7	2

Reference Books:

- | | |
|--|---|
| 1. Research Methodology Methods & Techniques | - C.R.Kothari, New Age International |
| 2. Statistical Methods | - S.P.Gupta, Sultan Chand, NewDelhi |
| 3. Business Research Methods | - William G.Zikmund, Thomson South-Western |
| 4. Introduction to Quantitative Research Methods | - Mark Balnaves and Peter Caputi ,Sage Publications |

Evaluation Format:

The Components of the Examination will be

- i) Written Examination for 70%
- ii) Small Project for 30% with viva-voce

Note: Use of SPSS, MATLAB-Statistical Tool Box, etc. for Data Analysis is recommended.

507: C++ LAB

Objective : This lab work provides hands-on for OOP and C++ language learnt in theory session.

C++ Programming assignments based on class, inheritance, abstraction, encapsulation, dynamic binding, polymorphism, I/O systems, exception handling should be covered..

601 : Field Base Presentation on Upcoming Technologies

Objective : To get accustomed to new and upcoming technologies used by Industry.

The candidate should visit IT companies / software houses and should study the new or upcoming technologies they are using and should prepare report of his field visit along with the detail study of technology, its implementation and should prepare example with actual use of technology, All this is to be presented by the candidate in front of panel consisting of experts from industry.

The distribution of 100 marks will be 50 marks for the field report and 50 marks for the presentation given in front the expert panel.

This subject is to be covered by the candidate himself at the institute he is working.

602 : DESIGN AND ANALYSIS OF ALGORITHMS

Objective : To understand and learn advance algorithms and methods used in computer science to create strong logic and problem solving approach in student.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	Introduction Algorithm, analysis, time complexity and space complexity, O-notation, Omega notation and Theta notation, Heaps and Heap sort, Sets and disjoint set, union and find algorithms. Sorting in linear time.	6	1,2
2	Divide And Conquer Divide and Conquer: General Strategy, Exponentiation. Binary Search, Quick Sort and Merge Sort	4	1,2
3	Greedy Method General Strategy, Knapsack problem, Job sequencing with Deadlines, Optimal merge patterns, Minimal Spanning Trees and Dijkstra's algorithm.	5	1,2
4	Dynamic Programming General Strategy, Multistage graphs, OBST, 0/1 Knapsack, Traveling Salesperson Problem, Flow Shop Scheduling	5	1,2
5	Backtracking Backtracking: General Strategy, 8 Queen's problem, Graph Coloring, Hamiltonian Cycles, 0/1 Knapsack	6	1,2
6	Branch and Bound General Strategy, 0/1 Knapsack, Traveling Salesperson Problem	5	1,2
7	NP-HARD AND NP-COMplete PROBLEMS Basic concepts, non-deterministics algorithms, NP-HARD and NP-COMplete classes, COOKS theorem	5	1,2

Reference Books

1. Bressard, "Fundamental of Algorithm." PHI
2. Horowitz/Sahani, "Fundamentals of computer Algorithms", Galgotia.
3. Thomas H Cormen and Charles E.L Leiserson, "Introduction to Algorithm" PHI
4. A. V. Aho and J.D. Ullman, "Design and Analysis of Algorithms", Addison Wesley

603 : ADVANCED DATABASE MANAGEMENT SYSTEMS

Objective:

To study the further database techniques beyond which covered in the second year, and thus to acquaint the students with some relatively advanced issues. At the end of the course students should be able to: gain an awareness of the basic issues in objected oriented data models, learn about the Web-DBMS integration technology and XML for Internet database applications, familiarize with the data-warehousing and data-mining techniques and other advanced topics

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	OODBMS & ORDBMS 1.1 Overview of Object-Oriented concepts & characteristics 1.2 Objects, OIDs and reference types 1.3 Database design for ORDBMS 1.4 Comparing RDBMS, OODBMS & ORDBMS	4	1,4,5,.6
2	Advance Database Management System – Concepts & Architecture 2.1 Spatial data management 2.2 Web based systems Overview of client server architecture, Databases and web architecture, N-tier Architecture, Business logic – SOAP 2.3 Multimedia databases 2.4 Mobile database	8	1,4
3	Parallel databases 3.1 Introduction 3.2 Parallel database architecture 3.3 I/O parallelism Inter-query and Intra-query parallelism, Inter-operational and Intra-operational parallelism 3.5 Design of parallel systems	4	1,4

4	Distributed Databases 4.1 Introduction, 4.2 DDBMS architectures 4.3 Homogeneous and Heterogeneous Databases 4.4 Distributed data storage, 4.5 Distributed transactions 4.6 Commit protocols 4.7 Availability 4.7 Concurrency control & recovery in distributed databases, 	4	1,4
	4.8 Directory systems		
5	Knowledge base Systems Integration of expert in database application & object database overview	4	2, 5
6	Data Warehousing 6.1 Introduction to Data warehousing, 6.2 Architecture Dimensional data modeling- star, snowflake schemas, fact constellation 6.4 OLAP and data cubes Operations on cubes 6.5 Data preprocessing -need for preprocessing, data cleaning, data integration and transformation, data reduction	8	2
7	Data Mining 7.1 Introduction to data mining 7.2 Introduction to machine learning, 7.3 Descriptive and predictive data mining, 6.4 outlier analysis, clustering – 7.5 k means algorithm, 7.6 Classification - decision tree, association rules - apriori algorithm, 7.7 Introduction to text rnh.mg, Bayesian classifiers.	8	2, 4,5

8	Information Retrieval & XML data 8.1 Introduction to information retrieval 8.2 Indexing for Text search 8.3 Web search engines 8.4 Managing text in DBMS 8.5 Data model for XML 8.6 XML DTD's, 8.7 Domain specific DTD's 8.8 Querying XML data	8	1
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Reference Books

1. Database system concepts', 5th Edition –Abraham Silberschatz, Henry Korth, S, Sudarshan, (McGraw Hill International)
2. Data Mining: Concepts and systems - Jiawei nan, Micheline Kamber, (Morgan Kaufmann publishers)
3. Database systems : "Design implementation and management"- Rob Coronel, 4th Edition, (Thomson Learning Press)
4. Database Management Systems - Raghu Ramkrishnan, Johannes Gehrke Second Edition, (McGraw Hill International)
5. Database Management System - Alexis Leao, Mathews Leon, (leon press)
6. Fundamentals of Database Systems - Ramez Elmasri , Shamkant Navathe

604 : HUMAN COMPUTER INTERFACE

Objective : To learn various aspects and design consideration and practices used in modern systems while developing an application interface between user (Human) and Computer.

Sr. No.	Chapter Details	Nos. of Session	Refer-ence Books
1	Introduction Human factors of interactive software, goods of system engineering, user interface design, motivation human factors in design.	3	3
2	Principles and Guidelines Usability paradigms, object action interface principles and rules, guidelines for data entry and display	4	3
3	Design Process Managing design process, design methodologies, participatory design. Usability and tests, Acceptability tests, Software tools, specification methods	5	1,4
4	Dialog Notation Design Visual thinking and icons, direct manipulation programming, virtual; environments, item presentation sequence, layout, form fill-in dialog boxes	5	1,4
5	Implementation Support Individual window design, multiple window design, coordination, image browsing, command organization, command menus, natural languages in compiling, window manages and user interfaces	5	2
6	Interactive Device Keyboards, Speech recognition, image & video displays, Response time and Display Rate	2	1
7	Documentation Presentation styles, balancing function, error interactions handling, errors, printed manuals, online facilities	3	2,3

8	Computer Supported Co-operation Goals of Co-operation, asynchronous interactions, synchronous distributed, application to education, and social uses	2	2
9	Information search and Visualization Database query and phase search in documents, multimedia document searches, information visualization, advanced filtering, hypertext and hypermedia, users and their tasks, object action interface model for website design	5	1,3

Reference Books

1. Designing the user interface - Ben shneiderman, Pearson Education Asia.
2. Human Computer interaction, 2/e - Alan J Dix, Janet E. Finlay, G.D. Abowd & Rusell Beale, Prentice Hall.
3. Elements of User interface design - Theo Mandel, JW and Son.
4. Essential Guide To User Interface Design - Willbert Galitz, JW.

605 : ADVANCED INTERNET TECHNOLOGY

Objective : To provide extension to web development skills acquired in 3rd semester, CGI-Perl, Servlets, JSP and PHP is introduced for student to enhance their skills.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1.	E-Commerce 1.1 Introduction E-commerce as business need, types, advantages, disadvantages, E-commerce Architecture, 1.2 Internet Payment Systems Characteristics 4C payment methods SET protocol for Credit card payment E-Cash, E-check Overview of Smart Card 1.3 E-commerce security Need of security Encryption: Public, Private & Hybrid Digital signature Authentication	6	1
2	Internet Basics 2.1 Overview of Internet, history, web system architecture, Uniform Resource Locator 2.2 HTTP protocol basics, HTTP request & response, Cookies Basics	3	1
3	PERL & CGI 3.1 CGI architecture 3.2 Intro PERL with Features 3.3 Variable & operators 3.4 Control statements 3.5 Working with Strings & arrays 3.6 File Handling 3.7 Pattern matching & formatting 3.8 Creating & using subroutines 3.9 Using PERL for CGI scripting Note: Apache HTTP server is used at server side	6	2,3,4

4	Servlets 4.1 Introduction Servlet vs CGI	6	3, 5,6
	Servlet API Overview Servlet Life Cycle 4.2 Coding Writing & running simple servlet Generic servlet, HttpServlet ServletConfig, ServletContext Writing servlet to handle Get & Post methods, reading use request data Session tracking in servlets, Servlets & JDBC. Writing threadsafe servlet Note: Apache HTTP server is used at server side.		
5	JSP Why JSP? JSP Directives Writing simple JSP page Scripting Elements Default Objects in JSP JSP Actions Managing Sessions using JSP JSP with beans JSP & Databases Error Handling in JSP Introduction to custom tag Note: Apache HTTP server is used at server side.	7	7,8,9

6	<p>PHP</p> <p>Obtaining, Installing & Configuring PHP</p> <p>6.1 Introduction</p> <p>PHP & web server Architecture Model</p> <p>Overview of PHP Capabilities</p> <p>PHP HTML embedding tags & syntax, Simple script examples</p> <p>PHP & HTTP Environment variables</p> <p>6.2 PHP Language Core</p> <p>Variables, constants, data types</p> <p>PHP: operators, flow control & loops</p> <p>Arrays, string, functions</p> <p>Include & require statements</p> <p>Simple File & Directory access operations</p> <p>Error handling</p> <p>Processing HTML form using GET, POST, SESSION, COOKIE variables</p> <p>Sending E-mail</p> <p>Intro. Of Object-oriented PHP</p> <p>6.3 Database Operations with PHP</p>	12	3, 10, 11, 12
	<p>Built in functions</p> <p>Connecting to My-SQL (or any other database)</p> <p>Selecting a db, building & Sending Query, retrieving, updating & inserting data</p> <p>Note: Apache HTTP server is used at server side.</p>		

Reference Books:

1. E-Commerce Fundamentals & Application Wiley publications
2. Teach Yourself PERL in 21 days Pearson Education.
3. Programming the World Wide Web Robert W. Sebesta
4. Web enabled commercial application development using HTML, DHTML, JavaScript, PERL-CGI Ivan Bayross.
5. Inside Servlets Dustine R. Callway
6. Developing Java Servlets James Goodwill
7. Professional JSP Wrox press
8. Complete reference JSP
9. Java Server Programming Vol-I Wrox press.
10. Beginning PHP5
11. Complete Ref. PHP
12. Beginning PHP, Apache, MySql web development.

606-A : PROGRAMMING LANGUAGE PARADIGMS

Objective : To learn programming languages structures, components, syntaxes.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	Language Design Issue 1.1 Short History 1.1.1 Development of early languages 1.1.2 Evolution of software architecture 1.2 Role of Programming languages 1.2.1 Attributes of language 1.2.2 Language paradigms 1.2.3 Language standardization 1.3 Programming Environment 1.3.1 Effects on language design Environment framework	5	1
2	Impact of machine architecture 2.1 Operation of Computer 2.1.1 Computer Hardware 2.1.2 Firmware Computers 2.1.3 Translator and Virtual Machines	3	1
3	Virtual computers & Binding times 3.1 Language Implementation 3.2 Hierarchies of virtual machines 3.3 Binding & Binding times 3.4 Language Translation Issue 3.5 General syntactic Criteria 3.6 Syntactic Element of language 3.7 Stages in translation 3.7.1 Analysis of source program 3.7.2 Synthesis of object program	4	1
4	Elementary Data Types 4.1 Properties of types and Object 4.2 Scalar data types 4.3. Composite data types	6	1
5	Sequence Control 5.1 Implicit & Explicit Sequence control	4	1

	5.2 Sequencing with Arithmetic Expression 5.2.1 Tree structure representation 5.2.2 Execution time representation 5.3 Sequence control between statements 5.3.1 Basic statements 5.3.2 Structured sequence control		
6	Subprogram Control 6.1 Subprogram Sequence Control 6.1.1 Simple call return subprograms 6.1.2 Recursive sub program 6.1.3 Examples in C & C++ 6.2 Attributes Of Data Control 6.2.1 Name & referencing environments 6.2.2 Static and dynamic scope 6.2.3 Block structure 6.2.4 Local data & local referencing Env. 6.3 Parameter Transmission 6.3.1 Actual and Formal Parameters Methods for Transmitting Parameters 6.4 Explicit Common Environments 6.4.1 Dynamic Scope State Scope and Block Structure	6	1
7	Storage Management 7.1 Element requiring storage 7.2 Programmer and system controlled storage 7.3 Static storage management 7.4 Heap storage management	6	1
8	Language Summaries 8.1 Language summaries of C++ & JAVA	6	1

Reference Books

1. Programming Languages Design & Implementation **Terrence W. Pratt** Pearson Education

606-B : ADVANCED UNIX

Objective : To learn Unix Operating system calls and processes and understand them thru small programs.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	Introduction to UNIX Evolution of Unix, Features, System structure, File System	3	1,2
2	File I/O System calls for file I/O, File Sharing, Concept of File descriptor duplication, File Control	3	1,2
3	Files and Directories File status, File types, Permission, ownership and related System call. File system, Links, File times Directory related functions	4	1,2
4	Standard I/O Library Streams, Buffering, open, read & write on streams, Binary I/O, Formatted I/O Temporary Files	4	1,2
5	Environment of Unix Process Process invocation and termination, Environment variables & List Memory Layout of C program & memory management routines	3	1,2
6	Process control Process identifiers, system calls related to Multitasking, Race condition Zombie & Orphan process, system	5	1,2
7	Process relationship Sessions, Controlling Terminal, Job Control Sharing data among parent & Child using Files	3	1,2
8	Signals Signal Concepts, Signal handling, Important signals: kill, raise, alarm, pause, and abort	3	1,2
9	Advanced I/O Record Locking , Streams, I/O Multiplexing, Memory Mapped I/O, various Read and write	4	1,2

10	Inter Process Communication Pipes, FIFO, System V IPC (Message Queue, Semaphore, Shared Memory)	5	1,2
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Reference Books

1. Advanced Programming in the UNIX environment W.R.Stevens
2. The C Odyssey UNIX Meeta Gandhi

607-C : MOBILE WIRELESS COMPUTING

Objective : To introduce network, system, techniques and applications in mobile computing.

Sr. No.	Chapter Details	Nos. of Session	Referenc e Books
1	Introduction Cellular networks, wireless LANs, application adaption administrative	1	1
2	Cellular Overview Cellular concept, location management, handoffs	2	1
3	Wireless LANs overview Mac issues, mobile IP, ad-hoc networks, TCP Issues	4	1
4	Applications Overview Wireless applications, disconnected operations, data bcasting, mobile agents	3	1
5	GSM Air-interface, channel structure, timing, architecture	4	2
6	WAP Architecture, protocol stack, application environment, application demo	3	3
7	TCP Asymmetric links, wireless errors, handoffs, i-tcp, snoop, link rxmit, m-top	4	4
8	Ad-hoc Networks Mac, routing, transport	3	4
9	Routing Virtual backbone, Kelpi, MobileIP	3	4
10	Sensor Networks SPIN, distributed computation	1	4
11	Data Broadcasting Push-pull, consistency	3	2

12	Mobile agents Design, applications frameworks: Aglets etc. Ajanta	5	2
13	Location Management HLR-VLR, hierarchical File systems: Bayou	1	2
14	Access Technologies Blue Tooth, GPRS, 802.11, CDMA	3	3
15	QOS in Wireless	1	-

Reference Books :

1. Mobile Communications J. Schiller, Addition Wesley Publication
2. GSM System Engineering A.Mehrotra, Addition Wesley Publication
3. Understanding WAP M. Heijden, M. Taylor, Artech House Publication
4. Mobile IP Charles Perkins, Addition Wesley Publication
5. Ad-hoc Networks Charles Perkins, Addition Wesley Publication

607-D : DISTRIBUTED DATABASE MANAGEMENT SYSTEM

Objective : To understand distributed databases, data fragmentation, data sites and other techniques used.

Sr. No.	Chapter Details	Nos. of Session	Reference Books
1	Introduction Distributed data processing, What is a DDBMS, Advantages and disadvantages of DDBMS, Problem areas, Overview of database and computer network concepts	3	3
2	Distributed database Management System Architecture Transparencies in a distributed DBMS, Distributed DBMS architecture Global directory issues	3	3
3	Distributed Database Design Alternative design strategies, Distributed design issues, Fragmentation, Data allocation	3	1,3
4	Query Processing Issues Objectives of query processing, Characterization of query processors, Layers of query processing, Query decomposition, Localization of distributed data	3	1,3
5	Optimizing Distributed Queries Factors governing query optimization, Centralized query optimization, Ordering of fragment queries, Distributed query optimization algorithms	3	3
6	Distributed Object Management Object model features, Fundamental object management issues, DOM architectures, Object caching, Object clustering, Object migration, Distributed object base systems	5	2,4,5
7	Query Processing In Distributed Object base Systems Problems in accessing distributed objects, Distributed object assembly problem, Strategies for distributed object assembly	3	4,5
8	Transaction Management The transaction concept, Goals of transaction management, Characteristics of transactions, Taxonomy of transaction models	3	3

9	Concurrency Control Concurrency control in centralized database systems, Concurrency control in DDBs, Distributed concurrency control algorithms, Deadlock management	3	3
10	Reliability Reliability issues in DDBs, Types of failures, Reliability techniques Commit protocols, Recovery protocols	3	5
11	Transaction Management In Distributed Objectbase Systems Additional demands of objectbase transactions, Transaction model extensions and alternatives, Classification of correctness criteria, Survey of objectbase transaction models	3	3
12	Other Topic Mobile database systems introduction/concept.	3	4,5

Reference Books:

1. Principles of Distributed Database Systems - M.T. Özsu and P. Valduriez. - Prentice-Hall
2. Distributed Object Management - M.T. Özsu, U. Dayal and P. Valduriez (editors) - Morgan-Kaufmann.S. Ceri and G. Pelagatti - McGraw Hill Book Company
3. Distributed Databases Principles and Systems - Dogac, M.T. Özsu, A. Billiris, and T. Sellis (editors) - Springer-Verlag
4. Advances in Object-Oriented Database Systems. - .
5. Modern Database Systems - The Object Model, Interoperability, and Beyond. ACM Press. W. Kim (editor).

Note

While teaching the subject and for evaluation the emphasis should be only on making the concepts clear as they do not have any practical for the paper.

607 : MINI PROJECT (USING AIT AND HCI)

Student will select individually Commercial or Technical project based on Application Development Technologies. Each student will have to prepare proper documentation consisting of SRS, Modeling Techniques, Development Strategies and Implementation and Testing Strategies. Student may use any Design Methodologies such as SSAD, OOAD and UML etc. This is a documentation project only. The project work will be presented by student using Power Point Presentation Tool to the panel appointed by the Head of Department.

***** END *****