NAME OF THE DEPARTMENT: COMPUTER SICENCE & ENGINEERING

V.

A) PROGRAMMES (POSTGRADUATE): MCA

Table 1

Sr. No	Name of Program	Total No of seats sanctioned	Durati-on	Cut off marks/percentage/per centile for admission (during last 3 academic years)			Fee structure	AICTE approved / accredited
				06-07	07-08	08-09		
POSTGRADUATE								
2	MCA	30	3 Years	**Conducted by Gujarat Common Entrance Test**				

NAME OF THE DEPARTMENT: COMPUTER SCIENCE & ENGINEERING

VI. FACULTY

Sr. No.	Name of the faculty (Beginning with surname)	Designation	Area of Specialization / Research
FACULTY APPOINTED ON PERMANENT BASIS			
1.	Prof. H J Patel	Professor	Information System Design, Software Engineering, Operating System
2.	Ms. Anjali Jivani	Lecturer	Database Management Systems, Data Structure
3.	Ms. Mamta Padole	Lecturer	Management Information System, Database Management System
FACULTY APPOINTED ON TEMPORARY BASIS			
1.	Shri K U Gupte	Temp. Lecturer	
2.	Ms. N N Shah	Temp. Lecturer	
ADJUNCT FACULTY			
1.	Shri Gyanesh Desai	Lecturer–Faculty of Commerce	
VISITING FACULTY			
1.	Shri Tushar Hindia	Visiting Faculty	
2.	Shri Prasad S Vipradas	Visiting Faculty	
3	Shri. M S Parikh	Visiting Faculty	
GUEST FACULTY			

NAME OF THE DEPARTMENT: Computer Science & Engineering

VII. PROFILE OF FACULTY:

1. Name of faculty: Patel Harshadrai Jethabhai
   Last name First name Middle name
2. Date of Birth: 2 9 // 0 8 // 1 9 5 1
   D D M M Y Y Y Y

3. Educational Qualification: M. Sc. (Phy.)
   (BE/ME/Ph.D.)

4. Area of Specialization : Software Development

5. Work Experience (In Years):

   Teaching: 19 Research: 2 ¾ Yrs Industry: 8 Others: ---

6.Subjects taught at

Undergraduate Level: Analysis & Design of Information Systems, Object Oriented Analysis
Postgraduate Level : & Design, Operating Systems

Postgraduate Level :

7. Number of research guidance at:

Particulars	Completed	Ongoing
Master's	MCA Students project	---
Ph.d.	---	---

8. Number of research publications:

National		International	
Journals	---	Journals	---
Conference/Seminars	---	Conference/Seminars	---

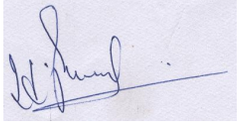
9. Number of project carried:

Particulars		Completed	Ongoing
Sponsored	Industry	---	---
	Govt. Agency	ONE	---
Consultancy	Industry	---	---
	Govt. Agency	---	---

10. Number of books published: Tw0 – Introduction to Computer for Std. XI & XII of GHSEB.

11. Number of Patents: ---

12. Number of Technology transfer: ---



Signature of the faculty

NAME OF THE DEPARTMENT: Computer Science & Engineering

VII. PROFILE OF FACULTY:

1. Name of faculty: Jivani Anjali Ganesh
   Last name First name Middle name
2. Date of Birth: 0 2 // 1 0 // 1 9 6 4
   D D M M Y Y Y Y

3. Educational Qualification: M. C. A.
   (BE/ME/Ph.D.)
4. Area of Specialization : Database Management Systems

5. Work Experience (In Years):

   Teaching: 17 Research: 2 Iustry: --- Others: ---

6.Subjects taught at

Undergraduate Level: DBMS, Advanced Technology in Database

Postgraduate Level : RDBMS, Advanced Technology in Database

7. Number of research guidance at:

Particulars	Completed	Ongoing
Master's	---	---
Ph.d.	---	---

8. Number of research publications:

National		International	
Journals	---	Journals	---
Conference/Seminars	9	Conference/Seminars	1

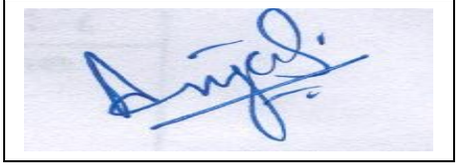
9. Number of project carried:

Particulars		Completed	Ongoing
Sponsored	Industry	---	---
	Govt. Agency	---	---
Consultancy	Industry	---	---
	Govt. Agency	---	---

10. Number of books published: 1

11. Number of Patents: ---

12. Number of Technology transfer: ---



Signature of the faculty

NAME OF THE DEPARTMENT: Computer Science & Engineering

VII. PROFILE OF FACULTY:

1. Name of faculty: Padole Mamta Chandraprakash
   Last name First name Middle name
2. Date of Birth: 2 9 // 0 6 // 1 9 7 1
   D D M M Y Y Y Y
3. Educational Qualification: M. C. A.
   (BE/ME/Ph.D.)
4. Area of Specialization : Computer Applications
5. Work Experience (In Years):

   Teaching: 8 Research: --- Industry: 2 Others: ---

6. Subjects taught at

   Undergraduate Level: Programming Languages(C,C++,JAVA), Operating Systems, Computer Fundamentals

   Postgraduate Level : Programming Languages(C,C++,JAVA), Operating Systems, Databases

7. Number of research guidance at:

Particulars	Completed	Ongoing
Master's	---	---
Ph.d.	---	---

8. Number of research publications:

National		International	
Journals	---	Journals	---
Conference/Seminars	2	Conference/Seminars	---

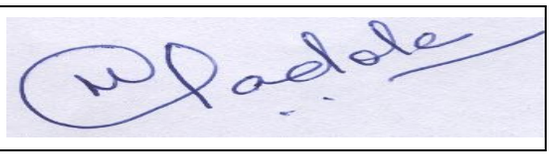
9. Number of project carried:

Particulars		Completed	Ongoing
Sponsored	Industry	1	1
	Govt. Agency	---	---
Consultancy	Industry	---	---
	Govt. Agency	---	---

10. Number of books published: 1

11. Number of Patents: ---

12. Number of Technology transfer: ---



signature of the faculty

NAME OF THE DEPARTMENT: Computer Science & Engineering

IX ADMISSION (POSTGRADUATE):

Sr. No.	Name of the program	No of seats sanctioned	Categories	No of students admitted under various categories (In 3 academic years)		
				06-07	07-08	08-09
POSTGRADUATE						
1	M. C. A.	30	SC ST SEBC OPEN OTHERS	2 5 7 15 --	2 5 8 14 1	2 5 8 14 1

* **NO MANAGEMENT QUOTA**

NAME OF THE DEPARTMENT: COMPUTER SCIENCE & ENGINEERING

ONLY FOR MCA / PGDCA

X. ADMISSION PROCEDURE:

(Write details briefly in one or two lines only)

A. Mention the admission test being followed, name and address of the Test Agency and its URL (Website):
GCET

B. Number of seats allotted to different Test Qualified candidates separately (AIEEE / CET (State conducted test / University tests / Association conducted test):

_____

_____

C. Calendar for admission against management / vacant seats:

i. Last date for request for application:

18/06/2009

ii. Last date for submission of application:

18/06/2009

iii. Dates for announcing final results:

15/07/2009

iv. Release of admission list (main list and waiting list should be announced on the same day): 08/08/2009

v. Date for acceptance by the candidate (time given should in no case be less than 15 days):

08/08/2009 to 09/08/2009

vi. Last date for closing of admission:

09/08/2009

vii. Starting of the Academic session:

17/08/2009

viii. The waiting list should be activated only on the expiry of date of main list:

09/08/2009

ix. The policy of refund of the fees, in case of withdrawal, should be clearly notified:

_____

NAME OF THE DEPARTMENT: Computer Science & Engineering

XI. CRITERIA AND WEIGHTAGE FOR ADMISSION:

Sr. No.	Name of program	Whether admission test or give marks of qualifying exam	Minimum level of acceptance	Category	Cut off percentage / percentile score of the candidate (in last 3 academic years)			Cut off marks of Test / Qualifying exam of the candidate (in last 3 academic years)		
					06-07	07-08	08-09	06-07	07-08	08-09
POSTGRADUATE										
1	MCA	GCET	40% any graduate	SC ST SEBC OPEN OTHER	**Conducted by Gujarat Common Entrance Test**					

NAME OF THE DEPARTMENT: COMPUTER SCIENCE & ENGINEERING

XIII. LIST OF APPLICANTS (POSTGRADUATE PROGRAM ONLY):

FOR YEAR 2009-10 ONLY

Sr. No.	Programme	Number of Applications Received									
		From M.S.U. Students					From Non M.S.U. Students				
		SC	ST	SEBC	OPEN	OTHER	SC	ST	SEBC	OPEN	OTHER
1	MCA	**Conducted by Gujarat Common Entrance Test**									

NAME OF THE DEPARTMENT: Computer Science & Engineering

XV. (B) INFORMATION ON INFRASTRUCTURE AND OTHER RESOURCES AVAILABLE:

1. NUMBER OF CLASSROOMS AND SIZE OF EACH (SQ. MTS.):

Room No	Area in sq. mts.
91	64.8
92	67.2
46B	50.4
46A	111.6
Hall	100.8

2. NUMBER OF TUTORIAL ROOMS AND SIZE OF EACH (SQ. MTS.):

Room No	Area in sq. mts.
1	100.8

3. NUMBER OF LABORATORIES AND SIZE OF EACH (SQ. MTS.):

Laboratory Name	Area in sq. mts..
IMPACT Lab	127.2
Compaq Lab	74.4
PDP Lab	70.5
HP Lab	64.0
Hardware Lab	68.2

4. NUMBER OF DRAWING HALLS AND SIZE OF EACH (SQ. MTS.):

Hall No	Area in sq. mts.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
FACULTY OF TECHNOLOGY & ENGINEERING
THE M. S. UNIVERSITY OF BARODA
Scheme of Teaching and Examination of Master of Computer Applications (MCA)
3 years Postgraduate course.

MCA - I Effective from Academic Year 2005 - 2006 onwards

First Semester

Sr. No.	SUBJECT	SCHEME OF TEACHING HOURS/ WEEK				SCHEME OF EXAMINATION (MAX. MARKS)		
		L	Tu	P	Total	Th	P/TW/ VIVA	Total
1.1.1	Mathematics	3	1	-	4	100	-	100
1.1.2	Structured Programming & Numerical Methods	3	1	3	7	100	50	150
1.1.3	Introduction to Information Technology	3	1	3	7	100	50	150
1.1.4	Computer Organisation	3	1	3	7	100	50	150
1.1.5	Organisational Structure	3	1	-	4	100	-	100
	TOTAL	15	5	9	29	500	150	650

Second Semester

Sr. No.	SUBJECT	SCHEME OF TEACHING HOURS/ WEEK				SCHEME OF EXAMINATION (MAX. MARKS)		
		L	Tu	P	Total	Th	P/TW/ VIVA	Total
1.2.1	Accounting & Financial Mgmt. and Banking Operations & Methods	3	1	-	4	100	-	100
1.2.2	Management Information System	3	1	-	4	100	-	100
1.2.3	Object Oriented Programming	3	1	3	7	100	50	150
1.2.4	Data & File Structures	3	1	3	7	100	50	150
1.2.5	Principles of Programming Language	3	1	-	4	100	-	100
	TOTAL	15	5	6	26	500	100	600

For tutorial and practical/drawing a batch of 15 students is considered

MCA - II Effective from Academic Year 2006 - 2007 onwards

First Semester

Sr. No.	SUBJECT	SCHEME OF TEACHING HOURS/ WEEK				SCHEME OF EXAMINATION (MAX. MARKS)		
		L	Tu	P	Total	Th	P/TW/ VIVA	Total
2.1.1	Relational Database Mgmt. System	3	1	3	7	100	50	150
2.1.2	Computer Based Optimization Methods	3	1	-	4	100	-	100
2.1.3	Analysis & Design of Information Systems	3	1	3	7	100	50	150
2.1.4	Data Communications	3	1	3	7	100	50	150
2.1.5	Operating Systems	3	1	3	7	100	50	150
	TOTAL	15	5	12	32	500	200	700

Second Semester

Sr. No.	SUBJECT	SCHEME OF TEACHING HOURS/ WEEK				SCHEME OF EXAMINATION (MAX. MARKS)		
		L	Tu	P	Total	Th	P/TW/ VIVA	Total
2.2.1	Computer Graphics	3	1	3	7	100	50	150
2.2.2	Translator Design	3	1	-	4	100	-	100
2.2.3	Graphical User Interface and Java Programming	3	1	3	7	100	50	150
2.2.4	Computer Networks	3	1	3	7	100	50	150
2.2.5	Object Oriented Analysis & Design	3	1	3	7	100	50	150
	TOTAL	15	5	12	32	500	200	700

For tutorial and practical/drawing a batch of 15 students is considered

Scheme of Teaching and Examination of Master of Computer Applications (MCA) 3 years Postgraduate course.

First Semester MCA - III Effective from Academic Year 2007 - 2008 onwards

Sr. No.	SUBJECT	SCHEME OF TEACHING HOURS/ WEEK				SCHEME OF EXAMINATION (MAX. MARKS)		
		L	Tu	P	Total	Th	P/TW/ VIVA	Total
3.1.1	Web Technologies	3	1	3	7	100	50	150
3.1.2	Elective - I	3	1	3	7	100	50	150
3.1.3	Elective - II	3	1	3	7	100	50	150
3.1.4	Client Server Architecture	3	1	3	7	100	50	150
3.1.5	Mini Project	-	-	3	3	-	100	100
	TOTAL	12	4	15	31	400	300	700

Elective – I

3.1.2.1 Image Processing & Multimedia
3.1.2.2 Software Engineering
3.1.2.3 Artificial Intelligence
3.1.2.4 Mobile Computing

Elective - II

3.1.3.1 Distributed Systems
3.1.3.2 Advanced Technologies in Databases
3.1.3.3 .NET Technologies

For tutorial and practical/drawing a batch of 15 students is considered

Second Semester

Sr. No.	SUBJECT	SCHEME OF TEACHING HOURS/ WEEK				SCHEME OF EXAMINATION (MAX. MARKS)		
		L	Tu	P	Total	Th	P/TW/ VIVA	Total
3.2.1	System Development Project	-	-	25	25	-	200+100	300
	TOTAL	-	-	25	25	-	200+100	300

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
FACULTY OF TECHNOLOGY & ENGINEERING
THE M.S. UNIVERSITY OF BARODA - VADODARA

SYLLABUS
F.S. MCA-I

1.1.1 : MATHEMATICS

Theory : 3 Lectures Marks : 100 Tutorial : 1 Prerequisites : None
Objectives : To study the concepts of Calculus, Matrices & Determinants and Interpolation which could help the students, in future, for developing applications related to mathematics. 1. Mathematical Logic : Propositions and propositional functions, Algebra of propositions, Predicate and quantifiers, Interaction of logical operators and quantifiers. Inference theory for arguments involving propositions and predicates, Methods of proof, Applications to areas like formal verification, formal specification and AI. 2. Graph Theory : Directed and undirected graphs, Incidence and degree, Elementary properties of graphs,Walks, paths and circuits, Euler and Hamiltonian graphs. Trees, Basic properties of trees, Distance and cemtres in a tree, Binary and rooted trees(r), Parentheses free expressions and their relation to tree traversal, Spanning trees , fundamental circuits. Planar graphs, Different representations of a planar graph, Detection of planarity, Euler's formula. 3. Automata and Theory of Computation : Theoretical modelling of computation, Finite State Automata, Their relation to languages, Nondeterministic finite automata and regular languages. Finite state transducers, Adders and code converters, Stack and pushdown automata, Turing machines, language recognition and function evaluation by Turing Machines, church's thesis. Algebraic structures, groups, lattice and boolean algebras. 4. Mathematical Induction
REFERENCES : 1. Discrete Mathematics in Computer Science - D.F. Stanat ,D.F.Mcallister 2. Graph theory with Applications to Engineering to Computer Science - Narsingh Deo 3. Discrete Mathematics A Unified Approach - S.A. Wittala 4. Discrete Mathematical Structures with Applications to Computer Science - I.T. Tremblay, R.P.Manohar 5. Elements of Discrete
Mathematics - C.L. Lill

1.1.2 : STRUCTURED PROGRAMMING AND NUMERICAL METHODS

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50
Prerequisites : None Objectives : To understand the various design issues involved in the development of a Programming Language and appreciate the features of any Programming language and thereby enable the students in applying the studied fundamentals to write efficient programs. 1. Fundamentals :Programming, Higher Level Languages, Operating System, Compiling Programs. 2. Programming in C Language :Foundation of programming, variables, constants, data types, Operators, Expressions & Assignment Statements, Control Statements, Console Input/Output, Arrays, Functions, Pointers, Structures, Unions & Enumerated Data Types, File Handling, The C Processor, Header File & Standard Library Functions, Unix Shell Script Programming. Numerical Methods : 1 Computer Arithmetic, Floating point representation of numbers, Arithmetic operations with normalised floating point numbers and their nsequences, Error in number representation pitfalls in computing 2 Iterative Methods, Bisection method, Falseposition method, NewtonRaphson method, Solving polynomial equations, Bairstow's method 3 Solution Of Simultaneous Linear Equations And Ordinary Differential Equations, Gauss elimination method pivoting, Illconditioned equations refinement of solution , GaussSiedal iterative method, Accelaration of iterative methods, Taylor series and Euler methods, Local and global error analysis, RungeKutte methods 4 Predictor Corrector Methods, Automatic error monitoring and change of step size 5 Stability Of Solution, Interpolation, Polynomial interpolation, Difference Tables, Differential calculus, Inverse Spline interpolation, Linear egression , Polynomial fitting and other curve fitting, Approximation of functions by Taylor series and Chebyshev polynomials 6 Numerical Differentiation And Integration 7 Differentiation Formula Based On Polynomial Fit 8 Pitfalls In Differentiation 9 Trapezoidal Rule 10 Simpson's Rules 11 Gaussian Quadrature
REFERENCES : 1 Programming in C - Schaum Series 2 C Programming - Kernighan & Ritchie 3 Let Us C - P. Kanetkar 4 C Pointers - P. Kanetkar 5 Computer Oriented Numerical Methods – Stoer Bullrich 6 Numerical Methods - Dorn & McCracken 7 Computer Oriented Numerical Methods -
Rajaraman

1.1.3 : INTRODUCTION TO INFORMATION TECHNOLOGY

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50
Prerequisites : None Objectives : This subject aims at getting the students acquainted with IT related topics. 1. Computer Fundamentals and Introduction to DOS & Unix Environment 2. Computer Hardware 3. Computer Software. 4. Introduction : Business and Information Technology. 5. Managing Organizational Data and Information. 6. Telecommunications and Networks. 7. The Internet and Intranets. 8. Interorganizational and Global Information Systems. 9. New Technologies in Information Technology 10. Information Systems Development. 11. Implementing IT : Ethics, Impacts, and Security. 12. HTML Language
REFERENCES : 1. Introduction To Information Technology - Turban, Rainer, Potter 2. Computer Fundamentals - V. Rajaraman 3. Fundamentals of Information Technology and Computer Programming - V.K.Jain

1.1.4 : COMPUTER ORGANIZATION

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50
Prerequisites : None Objectives : This course aims at teaching the students regarding the internal hardware details of the computer and basic assembly language programming. 1. Instruction Format :Operation Code, four, three, two & single address machine, types of addressing (Immediate, Direct, Indirect, Indexed),Execution of Instruction.

Computer Architecture : Implementation of Instruction fetch, Address Construction and Execution, Data flow, Control Block of Simple Processor, Concept of Microprocessor & its programming, Classification of Memory Microprocessor : Structure (Registers, Stack, Control), Instruction Set of One Type Microprocessor & its programming, Difference between , Microprocessor & Mini computer.

REFERENCES : 1 Computer System Architecture - Mano M. M. 2 8085 Programming – Lance Leventhol 3 8085 Hardware Design & Programming - Gaonkar

1.1.5 : ORGANIZATIONAL STRUCTURE

Theory : 3 Lectures Marks : 100 Tutorial : 1 Prerequisites : None Objectives : To enable students to understand the organizational hierarchy and management concepts 1. Management : Science, theory and practice : Definition of Management, Management ; Science or Art, Elements of science, Systems approach to operational management, Functions of managers 2. Evolution of anagement thought and the patterns of Management analysis :Fredrick Taylor & Scientific Mgmt.,Followers of Taylor, Fayol, Emergence of behavioral sciences, Patterns of Management analysis 3. Nature and purpose of planning :Nature of planning, Types of plans, Steps in planning, The planning process 4. Objectives:The Nature of objectives, The hierarchy of objectives, The process of setting objectives and the organizational hierarchy, Network of objectives 5. Strategies, policies and planning premises :The Nature and purpose of strategies & policies, Major kinds of strategies & policies, Industry analysis & generic competitive strategies, Effective implementation of strategies, Premising & forecasting 6. Organizing : ,Formal & informal organization ,Organizational division : the department, Organization levels and span of management, Factors determining an effective span 7. Organization Structure: Departmentation : By Simple numbers, time, enterprise function, geography, Choosing a pattern of departmentation, 8. Line/Staff authority and decentralization : Line and staff concepts, Functional authority, Benefits of staff, Limitations of staff, Decentralization of authority, Delegation of authority 9. Controlling: Basic process, feedback, critical control points and standards, RealTime information & control, Requirements for effective control, 10. Control Techniques and Information Technology : Control techniques, Program Budgeting, Procedures planning & control, 11. Staffing : Human resource management and selection, Factors affecting, analysis of needs of managers, other important aspects, Performance appraisal & career strategy, approaches to management development

REFERENCES : 1. A global perspective - Heinz Weihrich & Harold Koontz

S.S. MCA-1

1.2.1 : Accounting & Financial Management and Banking Operations and Methods

Theory : 3 Lectures Marks : 100 Tutorial : 1 Prerequisites : None

Objectives : To enable students to understand the concepts of accounting and financial

management systems and banking operations and methods and be able to develop a computerized account system or banking systems on the basis of it. Accounting:Meaning, Objectives, Functions and branches of accounting, Key terms, concepts / Assumptions and conventions., Classification of accounts and rules of debit and credit. An overview of Transaction Analysis / Accounting Cycle., Corporate Financial Statements (Annual Accounts), Contents, Formats, Analysis and Interpretation, Accounting Ratios, Du Pont Analysis, Trend Analysis. Financial Management: Meaning, Objectives and functions of Financial Management in a company., Core concepts: Cash-flow, risk & return, time value of money, opportunity cost and value., An overview of the financial system, Management of Working Capital -cash and inventory management., Financial Planning and Control, Computerized financial planning systems / models, Capital Budgeting:Significance, Process, Investment Appraisal Techniques, Capital Rationing, Sensitivity Analysis and Computer Simulation., Financial Markets and Operations including Internet Trading and Depository Systems Rematerialization and Dematerialization) and recent developments. Banking Operationsand Methods :, Operational System and Structure (Functional Units) of a typical bank,Information units of a bank,Strategic information needs, management information and data processing needs of a bank, Need for planning and budgeting in bank,Deposits /Advances and other services,Negotiable Instrument Act ,Computerization with reference to Rangrajan Committee Report , ALPM Lan and different systems in branches

References : 1 Financial Accounting - Dr. S.N. Maheshwari 2 Advanced Accountancy Vol I&II - R.L. Gupta & M. Radhaswamy 3 Fundamentals of Financial Management - Ramesh K. S. Rao 4 Financial Management - I.M. Pandey 5 Fundamentals of Financial Management – Prasanna Chandra 6 Financial Management-An Introduction - Jim McMenamin

1.2.2 : MANAGEMENT INFORMATION SYSTEM

Theory : 3 Lectures Marks : 100 Tutorial : 1 Prerequisites : Organizational Structure

Objectives : To enable students to understand concepts of management and study in detail the information systems which help the management in decision making. 1. Management Information Systems: MIS : Concept, MIS : Definition, Role of MIS, Impact of MIS, MIS and computer, MIS and academics, MIS and user 2. Information: Information concepts, Information : a quality product, Classification of information, Methods of data and information collection, Value of Information, General model of a human as an information processor, Summary of information concepts and their implications, Organization and information, MIS and information concepts 3. Systems : System concepts, System control, Types of system, Handling system complexity, Post implementation problem in a system, MIS and system concepts 4. Development Of MIS, Development of long range plans of MIS, Ascertaining the class of information, Determining the information requirement, Development and implementation of MIS, Management of quality in MIS,Organization for development of MIS, MIS : factors of success & failure 5. Applications In Manufacturing Sector 6. Applications In Service Sector 7. Decision Making: Decision concepts, Decision methods, tools & procedures, Behavioral concepts in decision making, Organizational decision ,making, MIS & decision

making concepts 8. Decision Support Systems: DSS concept and philosophy, DSS: Deterministic systems, AI systems, Knowledge Based Expert System (KBES), MIS and role of DSS 9. DBMS : Concept of RDBMS, 10. Enterprise Management System: EMS, ERP (Basic features), Benefits of ERP, ERP selection, ERP implementation, EMS & MIS 11. Business Process Re-Engineering: Introduction, Business process, Process model of organization, Value stream model of organization, MIS & BPR

REFERENCES : 1. Management Information System - W.S. Jawadekar 2. Management Information System - Jerome Kanter

1.2.3 : OBJECT ORIENTED PROGRAMMING

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites: 1. Procedural programming, 2. Structured programming Objectives : This course requires the students to have some prior experience in programming. The object oriented programming paradigm is introduced through this course and the implementation of those concepts in C++ are taught along. With their knowledge in this subject the students will be better prepared to handle courses in Windows Programming and Object Oriented Analysis and Design. 1) Introduction to the concept of Object Oriented Programming :The need for Object Oriented approach and comparison with the structured procedural) programming approach,The basic principles of an object oriented programming language 2) Basic Programming in C++:Basic Data Types of C++,Operators in C++ and building expressions,Program control structures,Writing functions in C++,Significance of function prototype and definition,Storate classes and scope rules,Scope resolution operator,Inline functions,Functions with default arguments,Function overloading,Pointers, Arrays and References,Call by value ,Call by reference 3) Object Oriented concepts in C++:Concept of encapsulation and abstraction,Implementing them through classes and structures, 4) Static Polymorphism:Function overloading,Operator overloading,Binary operators , Unary operators, 5) Data conversions:Basic and user-defined,Between two user-defined objects, 6) Inheritance:The need for inheritance,Base and derived class specification,Access specifiers with respect to inheritance,Types of inheritance,Multiple ,Mutli-level,Hybrid,Overriding of functions, Composition, Composition vs Inheritance, 7) Runtime Polymorphism:The need for runtime polymorphism,Virutal Functions,,Abstract base classes,Virtual base classes,Virtual destructors 8) Input and Output in C++:Console Input and Output,File processing in C++, 9) Templates:The neeed for templates, Function templates, Class templates,Templates and inheritance: 10) Exception Handling : What is exception handling,The syntactical elements : try, catch andthrow, Rethrowing, Exception pecification,Stack unwinding,Processing failures in memory allocation through ‘new 11) Advanced features:Castingoperator ,static_cast,reinterpret_cast,const_cast,Namespaces,RTTI,type_id,dynamic_cast,explicit constructors,mutable data members

REFERENCES : 1 C++ - How to Program : Dietel and Dietel 2 Programming in C ++: Robert Lafore

3 Let Us C++ : Yashvant Kanitkar

1.2.4 : DATA AND FILE STRUCTURES

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : Structured programming Objectives : Understanding of a structured programming language is required for the student to appreciate and understand the different data structures that can be used during programming. This subject discusses different data structures , their complexities and applications as compared to time and space management. After studying this subject the students will be able to decide which data structure is best suited for any given application. 1. Introduction & Overview:Introduction,Basic Terminology; Elementary Data Organization,Data Structures ,Data Structure Operations,Control ,Structures,Complexity of Algorithms 2. String Processing:Introduction,Basic Terminology,Storing Strings,Character Data Type,String Operations,String Manipulation - Markov Algorithms,Primitive Functions,Composite Functions,Pattern Matching Algorithms 3. Arrays, Records and Pointers:Introduction,Linear Arrays, Representation of Linear Arrays in Memory,Various Operations on Linear Arrays,Searching ; Linear Search, Binary Search,Multidimensional Arrays,Pointers ; Pointer Arrays,Records ; Record Structures,Representation of Records in Memory ; Parallel Arrays:Matrices, Sparse Matrices 4. Linked Lists:Introduction,Linked Lists, Representation of Linked Lists in Memory,Various Operations on Linked Lists,Memory Allocation ; ,Garbage Collection,Header Linked Lists,Two-Way Lists,Circular Linked Lists,Applications of Linked Lists - Sparse Matrix, Polynomial Representation, Dynamic Storage Management etc., 5. Stacks:,Introduction,Stacks, Array Representation of Stacks,Application of Stacks - Recursion, Quick Sort, Towers of Hanoi, Activation Record ,Management, Code Generation for Stack Machines, Arithmetic Expressions ; Polish Notation 6. Queues :Introduction, Definitions,Representation using arrays and Linked Lists,Circular Queues,Deques,Priority Queues,Application of Queues,Simulation, Round Robin Algorithm, CPU Job Scheduling 7. Trees:Terminologies, Definition & Concepts,Binary Trees, Representing Binary Trees in Memory,Traversals and Other Operations on Binary Trees,Threaded Binary Trees,Binary Search Trees,Heap Trees ; Heap Sort,Height Balanced Binary Trees (AVL Trees),Expression Trees,,Weight balanced Trees (Huffman Tree),General Tre s,B-Trees & B+ Trees 7. Sorting And Searching:Introduction,Insertion Sort, Selection Sort, Bubble Sort,Merging, Merge-Sort,Radix Sort,Searching and Data Modification 8. Hashing:Hash Tables,Hashing Techniques & Functions,Collision Resolution Techniques ,Open Addressing & Chaining,Comparison 9. External Sorting and Searching:Run Lists,Tape Sorting,Polyphase Sort, Oscillating Sort 10. File Structures:Sequential Files,Indexed Sequential Files,Direct Files

REFERENCES : 1. Introduction To Data Structures - remblay & Sorenson (TMH) 2. Data Structures - Lipschultz (Schaum Series) 3. Data Structures using C - Robert Kruse (PHI) 4. Classic Data Structures - D. Samanta (PHI)

1.2.5 : PRINCIPLES OF PROGRAMMING LANGUAGE

Theory : 3 Lectures Marks : 100 Tutorial : 1 Prerequisites : Structured Programming Language.
Objectives : To understand the various design issues involved in the development of a Programming language and appreciate the features of any programming language and thereby enable the students in applying the studied fundamentals to write efficient programs.
1. Introduction To Programming Languages :Why study Programming Language, What makes a good language, Software Development Process, Major influences on the design & evaluation of Programming language, Language Pedigrees, Paradigms of programming languages, Criteria for the design of programming languages 2. Data Types & Structures, Constructs for specifying data types & manipulation, Variables ,Attributes of variables, Concept of binding, Types of binding, Type checking, Type conversion, Declarations, Assignments, initialization of Variables, 3. Subprograms & Programmer Defined Data Types: Abstraction, Encapsulation, I information Hiding, Abstract Data Types, Procedure 4. Abstraction : Sequence: Sequence Control or Control Abstraction, Implicit & Explicit, Sequence control within expressions & between statements, Subprogram sequence control, Modular abstraction, Recursive subprograms, Exceptions & exception handlers, Coroutines, Scheduled ubprograms, Tasks and concurrent execution 5. Abstraction :Data:. Data control or data abstraction. Names & referencing environments. Static & Dynamic scope. Block Structure .Local data & their referencing environments. Shared data. Parameters & Transmission 6. Storage Management :Major runtime elements that require storage. Programmer controlled & system controlled storage mgmt.. Stack & Heap based .torage management. Heap storage fixed & variable sized elements 7. Syntax & Translation: Syntactic elements of language, Stages in translation, BNF for syntax representation, Formal semantic representation 8. Study Of Fortran, C, etc. In The Above Framework.
REFERENCES : 1 Programming Languages Design & Implementation- Terence W. Pratt 2 Fundamentals of Programming Languages - Ellis Horowitz 3 Principles of Programming Languages - Richard D. Tennent 4 Programming Lang. Landscape Syntax/Semantics/Impl. - Marcotty & Ledgard 5 Programming Languages - Allen Tucker 6 Programming Language Concepts - Ghezzi & Jazayeri

F.S. MCA - II

2.1.1 : RELATIONAL DATABASE MANAGEMENT SYSTEM

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50
Prerequisites : Any programming language, data structures, Management Information System.Objectives : To study the working and designing of a database and study the advantages of an RDBMS as compared to a DBMS or a 3GL tool. A project is undertaken to study a front-end and back-end tool related to a RDBMS. 1. DBMS Objectives And Architecture:Data management activities, desirable features, earlier methods and their limitations, data independence, objectives of DBMS, 3-schema architecture, DBMS languages, brief history of DBMS. 2. Introduction To E-R Model:Data model, features, E-R model: entities, relationships, their types, attributes, keys, Extended E-R Model : Aggregation, generalization. 3. Introduction To The Relational Data Model :Relational model concepts,Domains, Attributes, Tuples, Relations,Key attributes of a relation, Relational Database Schemas,Conceptual Database design,Database planning and design, Converting E-R model to tables,E.F. Codd's Rules for a Relational database Management System 4. Theory of Relational Databases:Null values-three valued logic,Relational Algebra-Basic Operators - Selection-Projection-Cartesian Product and Joins- Additional Operators-Union-Intersection-Set Difference-Division-Outer, Inner and Semi Joins- Relational Calculus-Tuple relational calculus-Domain relational calculus 5. Query Languages:SQL :SQL Data Types-Nulls in SQL2-Data Definition Language (DDL) i.e. CREATE, ALTER, DROP etc.-Data Manipulation Language (DML)-UPDATE, DELETE, INSERT-different queries : simple and nested-aggregate functions, grouping, ordering-Constraints, Assertions Views 6. Theory Of Normalization-Need and usefulness of normalization, principles of good design-Repeating groups and 1st Normal Form (1NF)-Functional dependencies and 2NF-Transitive dependencies and 3NF, details of Boycs Codd's normal form-Multivalued dependencies and 4NF-Join dependencies and 5NF 7. Details Of The Working And Features Of Oracle RDBMS-What is ORACLE-The role of Data Base Administrator-File Structure-Tablespace and segments-Memory Structures-Transaction Control- Consistency and Concurrency-Database backup and recovery- 8. Brief description of Hierarchical SystemPractical Work : Study and Work on a RDBMS e.g. ORACLE and work in detail on the utilities available like screen painters, report writes, embedded SQL Programs etc.
REFERENCES : 1. Database System Concepts - H.F. Korth & A. Silberschatz 2. Fundamentals of Database Systems - Elmasri & Navathe 3 Computer Database Organization - James Martin 4.An Introduction to Database Systems - C.J. Date 5. Understanding Oracle - James Perry & Joseph Lateer 6. Oracle - Ivan bayross 7. ORACLE manuals

2.1.2 : COMPUTER BASED OPTIMIZATION METHODS

Theory : 3 Lectures Marks : 100 Tutorial : 1 Prerequisites : Mathematics Objectives : This subject aims at teaching the students the different methodologies of Operations Research. The students will be able to apply the appropriate methods in computer based operations research techniques.
1. Linear programming problem-Introduction-Formation of LPP-Graphical Solution of LPP-Solution of LPP by simplex method-Big M Method- 2. Waiting lines (Queues)-Introduction-Characteristics of a queuing system-Transient & steady states of a queue-Distributions of arrivals & inter arrival time- Markovian property of inter-arrival time-Distribution of departures & service time-Queuing models- (M/M/1) : (oo/FCFS)-General erlang queuing model-(M/M/1):(N/FCFS)-(M/M/s):(/FCFS)- (M/M/S):(N/FCFS) Machine servicing model 3. Assignment problem-Introduction-Mathematical formulation of assignment problem-Hungarian Assignment method to solve assignment problem- Unbalanced assignment problem 4. Sequencing-Introduction to sequencing problems-Processing n Jobs

through two machines-processing n jobs through three machines-Processing two jobs through Machines-Processing n jobs through m Machines- 5. Dynamic Programming-Introduction- Characteristics of D.P.-Bellman's principle of optimality-Dynamic programming Approach in continuos & -discrete case-Solution of LPP by D.P.-Applications of D.P. 6. Pert & CPM-Introduction-Phases of project management-Network logic-Numbering the events (Fulkerson's Rule)-frequency distribution curve for PERT-forward pass computations-Backward pass computations-Slack-critical pathprobability of meeting the schedual dates-float

REFERENCES : 1. Operations Research - Kantiswarup, Manmohan Gupta 2. Operations Research -S.D. Sharma 3. Operations Research - F.S.Hiller & G.J. Liberman 4. Operations Research - H.A.Taha

2.1.3 : ANALYSIS & DESIGN OF INFORMATION SYSTEMS

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : 1. Organization Structures 2. Management Information Systems Objectives : The students taking this course should have good understanding of organizational functioning and significance of Information Systems. The course aims at discussing the issues involved in Analysis and Design of Information Systems with central focus on the study of System Development Life Cycle.After successfully completing this course students will be able to work as System Analyst after reasonable team experience. 1. Overview of Information Systems Development, Business Systems concepts, System Development strategies, System Development tools. 2. Overview of System Development Life Cycle, Initiation of system development projects 3. Preliminary Investigation, Requirements study and Information gathering, Determining system requirements, Tools for determining requirements, tools for documenting procedures & decisions. 4. Analysis of System tools for system analysis, Basic modelling concepts, Modelling for analysis, Data Flow Diagrams for analysis, Entity Relationship diagrams for defining Data Structures. 5. System Design, Analysis to Design transition, changing from analysis model to design model, Objectives in design of Information System, Logical to Physical design mapping, Elements of design, Identifying and including essential features into the design. 6. Essential requirements in design of Outputs, Inputs, online dialogues , files & controls. 7. Development and Implementation, System documents, system changeover, plane system testing, system control and audit reviews, system aintenance

REFERENCES : 1. Analysis Design & Implementation of information systems - James Senn 2. Information system concepts for mgmt - Lucas Henry C. 3. System analysis & design – Awad Elias M. 4. System analysis & design - Kendall & Kendall

2.1.4 : DATA COMMUNICATIONS

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : Computer Organization, C programming Objectives : To understand the communication fundamentals and architecture underlying and help in providing the basis for study of Networks. 1. Introduction:-Importance of Data Communication-Data Communication Model-Data Communication Components-Overview of Data Communication Networks-Data Communication Protocols and Standards 2. Signals-Analog and Digital Data-Analog and Digital Signals-Periodic & Aperiodic Signals-Time & Frequency Domain Representation-Composite – Signals-Decomposition of Digital Signal-Communication channel, channel capacity, Bandwidth, Bandwidth -Details 3. Encoding & Modulation-Digital-to-Digital Conversion-Unipolar, Polar, Bipolar-Analog-to-Digital Conversion-PAM, PCM, Sampling Rate, Bit -Rate etc.Digital-to-Analog Conversion-Aspects, ASK, FSK, PSK, QAM, Bit-Baud comparison-Analog-to-Analog Conversion-AM, FM, PM 4. Transmission Media-Guided Media-Twisted pair, Co-axial cable, Fiber-optic cable-Unguided Media- Radio Frequency Allocation, Radio Waves, Microwaves, -Satellite Communication, Cellular Telephony-Transmission Impairment-Attenuation, Distortion, Noise etc.-Performance-throughput, speed, time etc.,-Wavelength, Shannon Capacity, Media Comparison 5. Synchronous & Asynchronous Transmission 6. Multiplexing-Relationships-Frequency Division Multiplexing-Time Division Multiplexing-Wave Division Multiplexing-Multiplexing Application - -Telephone System-Digital Subscriber Line (DSL / ADSL)-Concept Discussion - Telephone N/w, Cable TV N/w 7. Transmission of Digital Data : Interfaces & Modems-Digital Data Transmission -Serial & Parallel- DTE - DCE Interface-Other Interface Standards-Modems - Transmission Rates, Standards-K Modems-Cable Modems -Downloading , Uploading 8. Communication Standards-RS-232 & Other Specifications 9. ISDN-ISDN Services-History-Subscriber Access to ISDN-Narrowband & Broadband ISDN- 10. Error Detection & Correction-Types of Errors, Detection Techniques, CRC, Correction Techniques- 11. Introduction to Data Communication Networks-OSI Model, X.25 Networks, Frame Relay, ATM, Sonet / SDH- 12. General-Switching Technology, LAN Topologies, Communication Devices-

REFERENCES : 1. Data Communication - By William Stallings (PHI) 2. Data Communication - By Williamn Schweber (TMH) 3. Data Communication & Networks - Behrouz Fourozan (TMH)

2.1.5 : OPERATING SYSTEM

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : 1. Computer Organization 2. Microprocessors 3. Systems Programming

Objectives : The course assumes students to have reasonably good knowledge of working of microprocessors and computers. Students should be able to appreciate various features of operating systems and evaluate critically their suitably in a given environment. They may also work on the projects for development of an operating system. Systems including various peripherals and assembly programming. 1.Overview of system software and operating systems. Development of operating system. History of evolution from monolithic systems to layered systems, resident monitors to multiuser, multitasking systems. Types of operating systems. 2.Operating system views of machine designers, system programmers and users. Requirements and functions of an operating system. Operating system objectives and environment. Operating systems and user interface. 3.Process management

functions in a single process and multiprocess environment. Process model and state transitions. Process scheduling. 4.Design issues of Concurrent processing systems. Race conditions and deadlocks - Issues and solutions. Interprocess communication and synchronization. 5.Memory Management: Contiguous and non-contiguous allocation. Virtual memory management. Instruction interruptablity in virtual memory. Different schemes of memory management. 6.File information management and file systems. File system functions. Directory organizations. Space management of file system. 7.Student's Assignment: Case Study of an operating system.
REFERENCES : 1. Operating Systems Concepts - Peter Galvin & A Silberchatz 2. Operating systems design & implementation - Andrew S. Tannenbaum 3. Operating systems principles – Milen Milenkovic 4. Operating systems principles - Hansen Per Brinch 5. Design of the UNIX Operating system - Bach M

S.S. MCA - II

2.2.1 : COMPUTER GRAPHICS

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prereuisites : 1. Data Structures. 2. Structured Programming 3. Mathematics. Objectives : Understanding the fundamental graphical operations and their implementation on a computer. Understanding the mathematics behind computer graphics, including the use of spline curves. After studying this subject the students will be able to design a graphical package. 1. Geometry And Line Generation-Lines-Vector Generation-Bresenham's algorithm-Character generation etc. 2. Graphics Primitives-Display devices-primitive operations-display-file-interpreternormalized device co-ordinates-display-file structure-display-file -algorithms etc. 3. Polygons- Polygon representation-algorithms-initialization-antialiasing 4. Transformations-Matrices-Scaling transformations-rotation-homogeneous co-ordinates and translation-other transformations-display procedures 5. Segments-The segment table-segment creation-closing/deleting/renaming a segment-some raster techniques etc. 6. Windowing And Clipping-The viewing transformationclipping- the Cohen-Sutherland outcode algorithm-clipping of polygons-generalized clipping-multiple windowing etc. 7. Interaction-Hardware-Input device handling algorithms-event handling-sampled devices-the detectability attribute-simulating a locator with a pick and vice-versa, echoing etc. 8. Three Dimension-3D Geometry-3D Primitives-3D ransformations-Rotation about an arbitrary axis- Parallel projection-Perspective projection etc. 9. Hidden Surfaces And Lines-Back -Face removal back-face algorithms-Z buffers-Scan-line algorithms-the painter's algorithm-Comparison techniqueshidden- line methods -binary space partition etc. 10. Curves And Fractals-Curve Generationinterpolation- interpolating algorithms-polygons-fractal lines-fractal surfaces etc

REFERENCES : 1. Principles of Interactive Computer Graphics - Newman W., Sproul R.F. 2 Interactive Computer Graphics - Giloi W. K. 3 Computer Graphics - Harrington S. 4 Computer Graphics - David F Rogers 5 Mathematical elements of Computer Graphics - David F Rogers

2.2.2 : TRANSLATOR DESIGN

Theory : 3 Lectures Marks : 100 Tutorial : 1 Prerequisites : 1. Principles of Programming Languages.2. Data Structures Objectives : This course assumes the knowledge of any programming language and the need for program compilation along with the advantages and disadvantages of data structures. The course teaches the basic structure of a compiler and the construction issues of a compiler. After the completion of this course the student will be able to design a compiler. 1.Two pass Assembler 2 LEX & YACC 3 Basic structure of compiler 4 Lexical Analyzer-Regular Expression-Input buffering-Transition Diagram-Transition Table-Finite Automata-- NFA – DFARegular -xpression to DFA-Regular Expression to Grammar 5. The Syntactic Specification of Programming Languages.-Context - free Grammars-Derivations and Parse trees-Capabilities of Context - free grammars 6. Syntax Analysis.-Top Down Parsing-Bottom Up Parsing-Operator - precedence parsing-LR parsers 7. Syntax Directed Translation 8. Type Checking 9. Run - Time Environments 10. Intermediate Code Generation 11. Code Generation 12. Code

Optimization

REFERENCES : 1. Principles of Compiler Design - Alfred V. Aho, Jeffrey D. Ullman 2.

Compilers - Principles, Techniques, and Tools - Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman

2.2.3 : GRAPHICAL USER INTERFACE & JAVA PROGRAMMING

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : Object Oriented Programming Objectives : The course requires that the students have experience in the use of object oriented programming paradigm. This is necessary so that the design of Graphical User Interfaces can be done more efficiently. The course implements GUI through JAVA. So students are also taught the basic concepts of JAVA before they learn the use of JAVA libraries for the design of GUI. On completion of this course, students will have a good understanding of the design of GUI based applications. 1. Fundamentals of GUI & Windows Programming :-GUI components, Frames, Windows and Panels 2. Introduction to Java-History of Java -Advantages of Java -Structure of Java Program 3. Fundamental Programming Structures in Java-Comments, Data types, Variables, Operators, Strings, Arrays -Control Flow-Class methods- 4. Objects and Classes-Introduction to objects and classes in Java-Relationships between classes in Java-Accessibility modifiers - public, package, -private, protected-Working with new, this, super-Garbage collection 5. Inheritance-Introduction to Inheritance-Casting-Abstract Classes-Dynamic Method Lookup-The *Class* Class and Run Time Type Identification 6. Interfaces and Inner Classes-Difference between Interfaces and Abstract Classes- Properties of interface-The *Cloneable* interface-Top-level nested classes (Static classes)-Non-static inner classes-Local classes-Anonymous classes 7. Threads-Multitasking, main thread, deamon threads-Creating threads: implementing the *Runnable* interface and extending *Thread* class Synchronization-Thread transitions 8. Packages-java.lang, java.io, java.event, java.awt,

javax.swing 9. Event Handling-Delegation Event Model-AWT Event Hierarchy-Individual Events - Focus events, Keyboard events, Mouse events- Advanced Event Handling - Consumer Events, The Event Queue, Adding Customer Events-Separating GUI and Application code 10. User Interface Components with Swing-The Model - View - Controller design pattern-Introduction to layout management-Text Input, Making Choices, Scroll Bars, Dialog Boxes-Menus

REFERENCES : 1. JAVA Developer's Guide : Jamie Jaworski 2. Core JAVA Vol - I Fundamentals : Cay S. Horstmann & Gary Cornell 3. JAVA - Complete Reference : Patrick Naughton

2.2.4 : COMPUTER NETWORKS

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : Data Communications Objectives : To enable students to understand and realize how devices can be interconnected to a form a network and used for information and resource sharing. Also help them in understanding internet/intranet concepts and other contemporary networks that use wireless technologies, etc. 1. Introduction to Computer Networks, Network Architecture, OSI reference model, services, network standardization. 2. Physical Layer : The theoretical basis for data communication, Guided Transmission Media, Wireless Transmission, Switching & Public switched telephone network, Mobile Telephone System, Cable Television 3. Data Link layer : Design issues, error correction & detection, Elementary Data Link Protocols, sliding window protocols, Example Data Link Protocols 4. The Medium Access Sub-layer : Channel Allocation, Multiple Access Protocols, IEEE standard 802 for LAN, Ethernet LAN, Wireless LANS, Broadband Wireless, Bluetooth, Data Link Layer Switching. 5. Network Layer : Design issues, routing algorithms, congestion control algorithms, internetworking, network layer in the internet. 6. Transport Layer : Design issues, Transport Service, Elements of Transport Protocol, Internet Transport Protocols – UDP & TCP 7. Application Layer : Domain Name System, Electronic mail, WWW, Multimedia Applications. 8. Network Security : Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms, Digital Signatures, Communication Security, Web Security

REFERENCES : 1. Computer Networks : A. Tanenbaum 2. Data & Computer Communications : Stallings W.

2.2.5 : OBJECT ORIENTED ANALYSIS & DESIGN

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : Analysis and Design of Information Systems Objectives : This course aims at making students familiar with concepts of system design methodology using object oriented approach. After successful completion of the course the students should be able to carry out modelling based on object designs. 1. Introduction to Object Orientation and Object Oriented methodology. 2. Basic concepts of Objects, Classes, Encapsulation, Inheritance, etc. 3. Object modelling concepts, links and Associates among classes. 4. Generalization Specialization relationships, Inheritance Aggregation relations, Multiple inheritance.5. Object relationship diagrams, Cardinality constraints, Subtypes / Subclasses and association, Abstract classes metadata. 6. Dynamic modelling and state diagrams, Events and states, State lifecycles, operations, Nested state diagrams, concurrency of operations. 7. Functional modelling in Object Oriented environment, Data Flow Diagrams specifying operations, constraints and identifying controls. 8. Design Methodology Analysis modelling and System Design, Object design combining three models optimization & packaging.

REFERENCES : 1. Object Oriented Modelling & Design - James Rumbaugh 2. Object Oriented Analysis and Design - Grady Booch

F.S. MCA III

3.1.1 : WEB TECHNOLOGIES

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : Computer Networks Objectives : Enables student to develop web based applications

1. Introduction to Networking. 2.Introduction to TCP/IP 3.Introduction to Electronic Commerce 4.Introduction to Web Technology 5. Dynamic Web Pages 6. Active Web Pages 7. User Sessions in E-commerce Applications 8. Electronic Commerce Transaction Management 9. Electronic Commerce Security Issues 10. Online Security and Payment Processing Mechanisms 11. Middleware and Component - based E-commerce Architectures 12. Electronic Data Interchange (EDI) 13. Extensible Markup Language (XML) 14.Wireless Application Protocol (WAP)15. Case Studies : Building Web commerce site, and Using Public Key Infrastructure (PKI) to provide security to Web applications.

REFERENCES : 1. Web Technologies - Achyut S Godbole, Atul Kahate

3.1.2.1 : ELECTIVE I (IMAGE PROCESSING & MULTIMEDIA)

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1

Practicals : 3 Hours Marks (Practicals) : 50 Prerequisites : 1. Computer Graphics 2. Structured Programming Language 3. Data Structures Objectives : Introduce the concepts to helps students to build high quality images useful in high end multimedia applications 1.Image digital representation :Elements of visual perception, Sampling and quantisation, Image processing system elements. 2 Fourier transforms, Extension to 2-D, DCT, Walsh, Hadamard transforms. 3 Enhancement and segmentation :Histogram modification, Smoothing, Sharpening, Thresholding, Edge detection, Segmentation, Point and region dependent techniques. 4 Image Encoding :Fidelity criteria, Transform compression. KL, Fourier, DCT, Spatial compression, Run length coding, Huffman and control coding. 5 Restoration : Models, Inverse filtering, Least squares filtering, Recursive filtering.

REFERENCES : 1 Digital Image Processing – Gonslaez

3.1.2.2 : ELECTIVE I (SOFTWARE ENGINEERING)

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50
Prerequisites : Analysis and Design of Information Systems Objectives : This course has a major objective of introducing students to the essential aspects of Software Engineering methods to ensure good quality software products as a part of system development project. 1. Introduction to Software Engineering : the software as product and a process, software process models 2. Software Requirements Definition : the software requirements documentation, System context, Requirements Definition & Evolution. 3. Software Design : the design process, Design strategies and Design quality. 4. Software Validation and Verification : the testing process, test planning, testing strategies, implementation. 5. Software Management : the management activities – Configuration management,Versioning, Software management structures, programmer productivity. 6. Software Quality Assurance : Process quality assurance, software standards, quality reviews, software metrics. 7. Case Tools
REFERENCES : 1. Software Engineering - Ian Sommerville 2. Software Engineering – A practitioner's approach - Roger S.Pressman

3.1.2.3 : ELECTIVE I (ARTIFICIAL INTELLIGENCE)

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50
Prerequisites : 1. Mathematics. 2. Structured Programming Language. Objectives : This subject aims at teaching the students Representation of world knowledge using symbolic logic, Deductive strategies employed in symbolic logic and Programming in prolog. 1.Facts, Questions, Variables, Conjunctions, Rules 2 Syntax, Characters, Operators, Equality and Matching Arithmetic 3 Structures and Trees, Lists, Recursive Search, Mapping Recursive Comparison, Joining Structure together, Accumulators, Difference Structure 4 Generating multiple solutions, The Cut, Common uses of the Cut, Preventing backtracking, Negation and Failure, Problems with the Cut 5 Reading and Writing Terms, Reading and Writing Files, Declaring Operators 6 Entering new clauses, Success and Failure, Classifying Terms 7 Treating clauses as Terams, Constructing and accessing components of structures, Affecting backtracking, Constructing Compound Golas, Equality, Input & Output, Handling Files, Evaluating Arithmetic Expressions, Comparing Numbers, Watching PROLOG at work 8 Operations on Data Structures:Representing and Sorting lists,,List Processing, Representing Sets by Binary Trees,Insertion and Deletion in Binary ,Dictionary.Displaying Trees, Graphs.Tree Representation.Search Strategies Depth first Breadth first Best first. 9 Brief Introduction to Predicate Calculus Horn Clauses 10 Declarative and Procedural meaning of PROLOG programs 11 Expert System 12 Natural Language Processing 13 Pattern Matching
REFERENCES : 1 Introduction of Artificial Intelligence - Charniak E. 2 Artificial Intelligence – Elaine Rich 3 Artificial Intelligence - Hunt E. D. 4 Programming in PROLOG - Clockcin & Mellish 5 Introduction to Turbo PROLOG - Carl Townsend

3.1.2.4 : ELECTIVE I (MOBILE COMPUTING)

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50
Prerequisites : Computer Networks Objectives : The Mobile Computing course is intended to teach students the issues involved in wireless technology. 1.Broadband Wide Area Networking; SDH, Frame Relay and ATM 2 Cell Relay and ATM Internetworking 3 Distributed Computing and The NFS 4 The Next Generation Protocols 5 Transition to Next Generation Protocols 6 Quality of Service and Real-Time Application Issues 7 Multicast 8 Voice Over IP 9 TDMA and CDMA; Features Compared and Contrasted 10 Mobile IP; Concepts and Issues 11 Wireless Application Protocol 12 Partial Mobility with Wireless Local Loops Practical and Term work The practical and Term work will be based on the topics covered in the syllabus. Minimum 5 experiments should be carried out.
Reference: 1 Internetworking with ISDN, Frame Relay & ATM -By William Stallings 2 ATM - protocols, applications and standards -By Hueber et al 3 Internetworking with TCP/IP : volume 1 & 3- By Douglas Comer 4 Computer Networks-By A. Tanenbaum 5 Unix Network Programming - 1 & 2 -By Richard Stevens 6 WAP Specifications www.wapforum.org Various RFCs, Technical Journals, Papers & Internet Drafts **********

3.1.3.1 : ELECTIVE II (DISTRIBUTED SYSTEMS)

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50
Prerequisites : Operating Systems Objectives : The Distributed Operating Systems course is intended to teach students the basic issues involved in design of different components of distributed operating system and familiarize them with a case study of such an operating system. 1. General Introduction to Distributed Systems : Hardware and Software concepts, Issues in design of a Distributed Operating Systems. 2. Synchronization in Distributed Systems : Considering clocks, Mutual Exclusion, Atomic transaction, Deadlocks in distributed systems. 3. Communication in
distributed systems : Covering layered protocols, ATM Networks, Client Server Models and Remote Procedure Calls. 4. Processes and Processors in distributed systems : Processor allocation, Threads, Scheduling, fault tolerance and real time distributed systems. 5. Distributed File Systems : design and implementation. 6. Distributed Shared Memory : Consistency Models, Page - based, object based shared memories. 7. Case Studies on a distributed system.
REFERENCES : 1. Distributed Operating Systems - Andrew S. Tanenbaum 2. Distributed System Concepts & Design – Colouris

3.1.3.2 : ELECTIVE II (ADVANCED TECHNOLOGIES IN DATABASES)

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50
Prerequisites : Relational Database Management System Objectives : This course will deal with the advanced topics / techniques of a database management system. The main aim is to study the concepts of Data Warehousing and Data Mining. Comparisons between the working of different database products like ORACLE,

DB2, etc. will be covered. After studying this course students will be able to design a Data Warehouse as per the given requirements. 1. The following topics shall be covered with respect to the currently popular databases like ORACLE, DB2, SYBASE, etc. with a view to illustrate availability of various features and facilities with these RDBMSs in consideration to following topics :Database Systems using DB2 UDB EE and ,RACLE,Database Architecture, Security, Authorization, Access granting and revoking,Transaction Processing, Concurrency and Locking,Backup and ,Recovery 2. Data Warehousing 3. Characteristics 4. Data Marts : Types, Loading,Meta Data,Data Model,Maintenance and Nature of Data,, Software Components, Tables,External Data, Reference Data,Performance Issues,Monitoring Requirements & Security, 5. Online Analytical Processing:OLTP and OLAP systems,Data Modelling,,OLAP tools, 6. Data Mining:Introduction,Algorithms,Database Segmentation,Predictive Modelling,Link Analysis 7. Tools for Data Mining 8. Developing a Data Warehouse 9. Applications of Data Warehousing and Data Mining (Case Studies)

REFERENCES : 1 Oracle Books - Oracle Press 2 DB2 Books (Online) 3 Data Warehousing - C.S.R. Prabhu

3.1.3.3 : ELECTIVE II (.NET TECHNOLOGIES)

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : 1. Object Oriented Programming 2. Networks 3. Databases Objectives: Students have already studied structured programming and object oriented programming using C and C++, respectively. Programming using .NET Technologies facilitates internet programming 1) An Overview of .NET & its goal: Introduction to .NET,The role of .NET Enterprise Servers, Origins of .NET,An overview of .NET framework 2) The .NET Framework's Common Language Runtime (CLR):The Anatomy of .NET Application,Common Type System, Metadata, Managed Data, Assemblies, Compiling Managed Code, Organising Managed Code, Executing Managed Code 3) The .NET Framework's Class Library:System Namespaces, System.Collections, Input Output, Threads, Serialization, Working with XML, Reflection,- .NET Remoting, Interoperability, Windows GUI's, Enterprise Services, Web Services 4) .NET languages 5) Building Web Applications using .NET Technologies

REFERENCES : 1. Introducing .NET- Wrox Publication 2. Understanding .NET- David Chappell 3. Microsoft .NET Compact Framework (Core Reference) - A. Wigley, S. Wheelwright, R. Burbidge, R. MacLeod, M. Sutton (Tata McGraw Hill & McGraw Hill)

3.1.4 : CLIENT SERVER ARCHITECTURE

Theory : 3 Lectures Marks (Theory) : 100 Tutorial : 1 Practicals : 3 Hours Marks (Practicals) : 50

Prerequisites : Structured & Object Oriented Programming Language , Relational Database Management Systems Objectives : This subject aims at teaching the evolution of CSA & issues related to its design and implementation. It enables the student to do internet intranet programming and n-tier architecture based application programming 1.Overview of Client/Server Computing 2-Evolution of Client/Server Computing3-Overview of Client/Server Applications4-Understanding Client/Server Computing,5-Client Hardware & Software6- Client Requirements 7-Server Hardware8-Server Environment 9-Server Requirements10- Development Methodology 11-Application Development Tools 12-Java Networking Model 13-Java Database Connectivity a Remote Method Invocation b-Servlets c-Java Beans d-Enterprise Java Beans e-Java Mail f-JMS & J&DI

REFERENCES : 1 Client Server Architecture – Alex Berson 2 Client/Server Computing – Dawna Travis Dewire 3 Developing Client Server Applications – W.H. Inmon 4 Java in a Nutshell – David

Flanagan 5 Sun Microsystems Press Java Series vol1 & 2 – Peter van der LINDEN 6 Java2 Platform, Enterprise Edition Platform & Component Specification – Sun Microsystems – Shannon 7 Java Server & Servlets - Rossbach 8 The Java Tutorial – Mary Campione & Kathy Walrath 9 Internet & WWW – How to program – Dietel, Dietel & Nieto 10 Java API – Reference – Colin Fraizer 11 Headfirst Servelets and JSP – Kathy Sierra 12 EJB's – O'Reilly

3.1.5 : MINI PROJECT

Practicals : 3 Hours Marks (Practicals) : 100 Prerequisites : The subjects that teach 1. Programming Methodologies, 2. Programming Languages, 3. front-end tools., 4. back-end tools.5. System Analysis and Design. Objectives : This course aims at preparing the students for their final year system development project and also in enhancing computer applications in diversified organizational environment.

S.S. MCA III

3.2.1 : SYSTEM DEVELOPMENT PROJECT

Practicals : 25 Hours Marks (Practicals) : 300 Prerequisites : The subjects that teach 1. Programming Methodologies 2. Programming Languages 3. front-end tools. 4. back-end tools. 5. System Analysis and Design. Objectives : The final year project is expected to expose the students to real life situations and provide them an insight into actual functioning of an organization. During the project development the student is expected to get knowledge and experience of the entire life cycle of project development. After completing the project the students should be in a position to handle projects in an organization independently.

Department of Computer Science & Engineering
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Teaching Staff
Seating Row (From Left to Right)
1.MRS. A G JIVANI. 2. SHRI P R BHAVSAR (OFFG. HEAD) 3. PROF. B S PAREKH (DEAN)
4. PROF. H J PATEL 5. MS. M C PADOLE
Standing Row (From Left to Right)
1.MRS. N N SHAH 2. MS. T. A. PATEL 3. MR. K U GUPTE 4. MS. D T MEHTA
5. MS. R D PRAJAPATI

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1. SHRI J V WAGHELA 2. SHRI P G RAVAL 3. SHRI P R BHAVSAR (OFFG HEAD)
4. SHRI D V PATEL 5 SHRI S V PATEL
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1. SHRI G C TADVI 2. SHRI U R PARIKH 3. SHRI S R NANAWARE