VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VII

SCHEME FOR TEACHING AND EXAMINATION

B.E.IV (CO) 7th Semester		Teaching Scheme			Examination Scheme						
					Theory Exam		Practical/Quiz/Viva/T.W. etc.				
					University Exam.		University Exam.		Tutorial	Cont. Evaluation	Total Marks
Course	Course No.	L Hrs.	T Hrs.	P Hrs.	Duration Hrs.	Marks	Duration Hrs.	Marks			
User Interface	ECC 701 CO	3	1	2	3	100	3	30	25	20	75
Data Base Management Systems	ECC 702 CO	3	0	2	3	100	3	30	0	20	50
Unix Programming	ECC 703 CO	2	1	2	3	100	3	30	25	20	75
Computer Network-II	ECC 704 CO	3	1	0	3	100	0	0	25	0	25
Operating Systems	ECC 705 CO	3	1	2	3	100	3	30	25	20	75
Seminar	ECC 706 CO	0	2	0	0	0	0	30	0	20	50
Project Preliminaries	ECC 707 CO	0	0	3	-	-	0	30	0	20	50
		14	**6**	**11**	**-**	**500**	**-**	**180**	**100**	**120**	**400**
Total Contact Hours: 30							**Total Marks: 900**				

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VII

ECC 701 CO : User Interfaces

	Lecture	Tutorial	Practical
Teaching Hours	3	1	2
Examination Scheme Marks	100	25	Cont. Evaluation : 20 Examination : 30

1. Introduction – Graphical User Interface concepts and Architecture – Visual Programming – User Interface Development – Painting Text – Drawing Graphics – Keyboard & Mouse Messages Handling – Icons – Menus & Accelerators – Dialog Boxes.
2. Advanced User Interface – Memory Management & File I/O – Multitasking & Multithreading – Printing graphics & Text – Clipboard – Dynamic Data Exchange – Multi Document Interface – Dynamic Link Libraries – Object Linking & Embedding – Component Object Model Interface – Creating Help File.
3. Multimedia Interfaces – File formats for various media – sound Blaster Card – Image and Fonts Handling – Image File Formats – Viewing Images – Printing Images – Font & Texture manipulation.

References:

1. Jim Conger : Windows programming Primer Plus, Galgotia Publication Pvt. Ltd, 1st Ed. 1994.
2. Michael Young: Master Visual C++, BPB, 2nd Edition, 1997

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

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Semester - VII

ECC 702 CO : Database Management Systems

	Lecture	Tutorial	Practical
Teaching Hours	3	0	2
Examination Scheme Marks	100	-	Cont. Evaluation : 20 Examination : 30

1. Review o the basis concepts: Review of the basic concepts of the DBMS studied in the course CBIP at the II nd year level – Integrity Constraints – A General Model for Integrity – Expressing Integrity Constraints.
2. Relational database design – Pitfalls in relational Database Design – Decomposition & Desirable properties – Anomalies Normalization using Functional Dependencies. Normalization using Multi-valued dependencies. Join dependencies. DKNF. Alternative approaches to Database design. Brief idea of Inclusion, Template & Mutual dependencies.
3. Object Oriented & Object Relational Databases: New Applications, The limitation due to 1NF, The Object-oriented Data Model – Persistent Programming languages. Nested Relational Model – Querying with complex types. Comparison of Object – oriented & Object relational Databases.
4. Databases Design & Internal Organization: File Organization- data-dictionary storage – Storage structures for Object-oriented databases – Static & Dynamic Hashing; Comparison of ordered Indexing & Hashing – Multiple – Key access.
5. Query Processing - Overview - General Strategies. Query Representation Transformation - Catalog information - Estimated size of relations - Measures of Query cost; selection, sorting, Join & other operations. Query Evaluation & choice of Evaluation Plans.
6. Transactions & Concurrency Control - Properties - Serializability - Recoverability - The problems in concurrency control - Semantics of Concurrent Transactions - Locking scheme - Time-stamp based protocols - Validation-based protocols - Deadlock handling. Recovery with Concurrent Transactions. Failure with Loss of Nonvolatile Storage.
7. Miscellaneous Topics: Introduction to the concept of concept of Database Machines; Introduction to the advanced topics viz. DSS, Data Analysis, OLAP, Data mining & Warehousing Multimedia databases, Spatial & Geographic Databases, Information Retrieval Systems; The Concept of Web-Warehousing.

The course should be supplemented by the practical assignments involving the implementation of components of a relational database system. Students should implement optionally at least three components out of the ones mentioned below:

a. Constructing a relation manager on top of a storage manager such as Exodus. The relation manager should support relation scans with and without primitive predicates (= value, < value, > value).
b. Implementing some relation operations, such as joins, on top of the relation manager.

c. Implementing a primitive file systems (page files) a primitive collection manager (heap files), and a buffer manager.
d. Implementing a small application project based on some popular RDBMS/OODBMS/ORDBMS to run through the semester.

All the interfaces in the modules above are to be defined by the instructor.

References:

1. a Silberschatz, Henry Korth, S Sudarshan : Database System Concepts by; McGraw Hill, 3rd ED, 1997.
2. C J Date : Introduction to Database systems, Narosa, 2nd Ed. 1997.
3. Bipin C Desai: An Introduction to Database Systems, West Publishing Co, 1993.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VII

ECC 703 CO : UNIX Programming.

	Lecture	Tutorial	Practical
Teaching Hours	2	1	2
Examination Scheme Marks	100	25	Cont. Evaluation : 20 Examination : 30

1. Introduction : Log in - Files and Directories - Input and Output - The concept of Programs and Processes - Error Handling - signals - UNIX System Call Interface. Introduction to Unix Tools & Utilities : brief overview of examples & usage of Unix tools (shell programming, awk, grep, cut, tar, compress etc) - Programming tools (make, source code control, debuggers) - language tools (lex, yacc)- GUI programming tools Tc1/Tk and document processing tool Latex.
2. File Input / Output & related System calls: Introduction to the files in UNIX – File Descriptors – File Handle representation – system calls for file Input & output – I/O efficiency – File sharing.
3. Files, Directories & Related Functions / System Calls: File types in UNIX, systems calls and their use for non regular types of files – Set-Group-ID – file Access permissions – Concept of sticky bit – File size, file Truncation. Symbolic links. File Times – Directory handling & Manipulations. Special Device files. Summary of File Access permission Bits.
4. System data files, system Information & related Functions / Calls: Introduction – password file – shadow Passwords – Group Files – Other Data files used by the system to store vital information – Login Accounting Files, system Identification, Time and date routines. The Environment of a Unix process – main function – process termination functions – Environment Lists – Memory Layout of a C program – Shared Libraries – automatic, register and Volatile variables.
5. Process control & related system calls/Functions : Introduction – Identifiers – Creating Process – File sharing – Race conditions – Execution – Changing User Ids and group Ids – Interpreter files, Set – User-ID programs – user identification – process times Inter process communication – Pipes – Coprocesses – FIFOs – Message queues – Semaphores – shared Memory. Thread synchronization.
6. Signals & the related system calls/Functions: signal concept – sending signals – Real – time signals. Job-control signals.
7. Terminal Input/Output & System calls / Functions: overview, Getting and setting terminal attributes – Terminal attributes – Terminal Option Flags – Baud rate functions – Terminal Identification – canonical mode. Terminal Window size.
8. Network And socket programming Related System calls.

Practical Assignments shall be based on the theory topics above and shall consist of implementation of small routines/tools/programs/utilities using the system calls specified above. Practical assignment shall be specifically based on the system call Interface of any UNIX system like Linux.

References :

1. W.Richard Stevens : Advanced Programming in the UNIX Environment, Addison – Wesley, (NAROSA), 1994 reprint.
2. Husain, parker : Linux Unleashed, 2nd edition, Techmedia pub, 1997.
3. Jerry D Peek, Tim O'Reilly, Mike Loukides : UNIX Power Tools, O'Reilly & assiociates, 1997.
4. Kernighan & Pike : UNIX programming Environment, PHI, EEE, 1995 reprint.
5. Stephen Prata : Advanced UNIX : A Programming Guide, BPB pub, 1995 reprint.

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B.E.- IV (Computer Engg.)

Semester - VII

ECC 704 CO : Computer Networks - II

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

1. Introduction : - Layering, TCP/IP Layering, Internet address, Domain Name System, Port Numbers, RFCs, Internet Protocol, IP header, IP Routing, Subnet Addressing, Subnet Mask, Ping Program, Client Processes and server process.
2. Address Resolution protocol: - ARP Cache, ARP Packet format and examples, Reverse Address Resolution protocol, RARP Packet format and examples, RARP Server Design.
3. Internet Control Message protocol :- ICMP Message Types, ICMP Address mask Request and Reply, ICMP Timestamp Request and Reply, ICMP Messages Processing.
4. User Datagram Protocol:- UDP Header, UDP checksum, IP Fragmentation, Interaction Between UDP and ARP. UDP server Design.
5. Transmission Control Protocol : - TCP services, TCP Header, TCP Connection Establishment and Termination, TCP Interactive Data flow, TCP Timeout and Retransmission.
6. Simple Network Management protocol :- Structure of Management Information, Object Identifiers, Introduction to Management Information Base, Defining MIBs, Contents of Transmission MIB, Management stations, MIB data types, Mib Object, Simple Examples.
7. Introduction to file Transfer protocol, Simple mail transfer Protocol, Bootstrap Protocol, Trivial File Transfer protocol, Internet Group Management Protocol.
8. IP Multicasting and Broadcasting .
9. Network and Information security – Cryptography, Encryption, Authentication , Firewall.

References:

1. TCP / IP Illustrated Volume – I by W.Richard Stevens, Pub. Addison Wesley, 1994.
2. Internetworking with TCP/IP Volume – I by Douglas E. Comer, Pub. PHI, India Reprint 3rd Edition – 1996.
3. Unix Networking programming by W. Richard stevens, Pub. PHI, 4th edition – 1994.
4. SNMP A Guide to Network Management by dr. Sidnie Feit, Pub. McGraw – Hill International Editions – 1995.
5. Data and computer Communications by William Stalling, Pub, 4th Ed. (1996)
6. Computer Network by Tanenbaum, pub. PHI.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VII

ECC 705 CO : Operating Systems

	Lecture	Tutorial	Practical
Teaching Hours	3	1	2
Examination Scheme Marks	100	25	Cont. Evaluation : 20 Examination : 30

1. Introduction & Overview – Operating Systems Objectives – Formal Definition – Evolution – Types – DMA & OS – Multiprogramming – OS Interfaces – The Command-less command interpreter systems – Device & unification of the concept of files & devices. Introduction to the examples of contemporary operating systems.
2. Process Management : The Process Concept – Programs, Processes & Threads – Process Hierarchy – Process Management Systems Calls – CPU Scheduling & algorithms with examples – Evaluation – Concurrent Processes – The critical section problem – algorithms for mutual exclusion – semaphores, Critical Region, Monitors, Messages. Examples of IPC in Contemporary Operating Systems – Classical Process Co-ordination problems. Deadlocks: Characterisation – Prevention – avoidance – Detection – Recovery – Combined Approach to Dead stock handling & dead stock Handling in Contemporary operating Systems.
3. Memory management – Overview of swapping – Multiple Partitions – paging – segmentation – Virtual memory – demand paging Performance – Fragmentation & Compaction. Page replacement algorithms – allocation algorithms – Memory protection – Memory management system calls.
4. Device Management: Terminals & Capability Database – Emulators – Virtual Terminals – Disk devices Independence – RAID devices – devices Driver Interface. Disk Drive Access Techniques – Free space management – Performance and reliability improvements – Storage hierarchy. File Meta-data – Allocation strategies – Directory systems & their implementations – Systems calls; Connecting File systems to devices drivers – file systems reliability – File Protection – Implementation issues.
5. Modern Operating systems: Thread scheduling – Client server architecture – Ordinary File sharing vrs network Operating Systems – real-time systems – Comparative survey/study of architecture of contemporary operating systems – Introduction to Micro-Kernel based operating systems – The development towards a Distributed operating systems.

Practical work shall be based on the shell programming exercises in any typical dialect (like Linux) of UNIX operating systems – including the UNIX utilities like the awk, grep, cut, tar, compress, etc – with an emphasis on UNIX systems Administration.

Reference:

1. Silberschatz A & Galvin; Operating System Concepts, Addison Wesley, 3rd edition, 1998.
2. Andrew s Tanenbaum: Operating systems – Design and Implementation, PHI EEE, 3rd ed, 1997.
3. Crawley : Operating systems An Object oriented Approach, McGraw Hill, 1998.
4. Stallings: Operating systems, 2nd edition, PHI EEE, 1995.
5. Husain, Parker : Linux Unleashed, 2nd edition, Techmedia Pub,1996.
6. Kernighan & pike : UNIX Programming Environment, PHI EEE, 2ne Ed, 1995 reprint.
7. Husain, Parker : Linux Unleashed, 2nd edition, Techmedia Pub, 1997.
8. Berny Goodheart, James Cox: The Magic Garden Explained : The Internals of UNIX SVR4, Prentice – Hall International, 1994.
9. Soumitro Das : UNIX System V Rel 4.00, TMH, 1993.
10. Stephen Prata : Advanced UNIX : A Programmers Guide, BPB Pub, 1996 reprint.

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Semester - VII

ECC 706 CO : Seminar

	Lecture	Tutorial	Practical
Teaching Hours	0	2	0
Internal Examination Scheme Marks	-	--	Cont. Evaluation : 20 Examination : 30

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B.E.- IV (Computer Engg.)

Semester - VII

ECC 707 CO : Project Preliminaries

	Lecture	Tutorial	Practical
Teaching Hours	0	0	3
Internal Examination Scheme Marks	-	-	Cont. Evaluation : 20 Examination : 30

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Semester - VIII

B.E.IV (CO) 8th Semester		Teaching Scheme			Examination Scheme						
					Theory Exam		Practical/Quiz/Viva/T.W. etc.				
					University Exam.		University Exam.		Tutorial	Cont. Evaluation	Total Marks
Course	Course No.	L Hrs.	T Hrs.	P Hrs.	Duration Hrs.	Marks	Duration Hrs.	Marks			
Internet Technology & Application	ECC 801 CO	3	0	4	3	100	4	60	0	40	100
Software Engineering	ECC 802 CO	3	0	2	3	100	3	30	0	20	50
Information Technology & Management	ECC 803 CO	3	0	0	3	100	-	-	-	-	-
Elective –I	ECC 8XX CO	3	1	0	3	100	4	-	25	-	25
Elective-II	ECC 8XX CO	3	1	0	3	100	4	-	25	-	25
Project	ECC 804 CO	-	-	8	-	-	-	120	-	80	200
	TOTAL:	**15**	**2**	**14**	**-**	**500**	**-**	**210**	**50**	**140**	**400**
Total Contact Hours: 31								**Total Marks: 900**			

Elective-I ECC 811 to 816

Elective-II ECC 821 to 826

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Semester - VIII

ECC 801 CO : Internet Technology and Application

	Lecture	Tutorial	Practical
Teaching Hours	3	0	4
Examination Scheme Marks	100	00	Cont. Evaluation : 40 Examination : 60

1. Introduction – Internet Origin & Development – Internet Architecture frame work – Word Wide Web.
2. Script Language & Programming – Programming with PERL.
3. Introduction to CGI – Basics of CGI, SSI Commands – Active Server Pages - CGI Programming & HTML Forms – Use of CGI for the protection & security – CGI Programming using PERL.
4. Advanced Java Programming – Java Applets – CGI Programming using Java servlet – Java script – Applications – Integrating Java & Java script – Security in Java.
5. Extensible Markup Language (XML) – Introduction – Origin and Goals – XML Documents – Common syntactic constructs – XML tags – XML Processors.
6. Internet Application – interactive Web page Development – Interfacing with Data bases , internet Access and security – authentication.

Reference:

1. Michael : The web Programming Desktop Reference , PHI, 1998 ed.
2. Mark Gaither & ed Tittel: web Programming secrets with HTML, CGI & Perl, comdex IDG Books, 1996 ed.
3. Patric and Herbert :The Complete reference JAVA, TMH, Reprint 1997.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)
Semester - VIII
ECC 802 CO : Software Engineering

	Lecture	Tutorial	Practical
Teaching Hours	3	0	4
Examination Scheme Marks	100	00	Cont. Evaluation : 20 Examination : 30

1. Introduction : software Process, Scope of software engineering, software development Life Cycle. Steps- Effort Distribution. Problems with software Production. Aspects of Estimation and scheduling.
2. Software Life – cycle Models : Build – and – Fix , Waterfall, Rapid Prototyping , Incremental spiral Comparison, ISO 9000.
3. Stepwise refinement, CASE and other tools : step – wise refinement, Cost-Benefit Analysis, CASE, scope of CASE, software Versions and configuration control, Productivity gains with CASE.
4. Testing Principles: quality issues, Non-execution based testing, Execution based testing, Testing vrs Correctness Proofs.
5. Object Oriented Methodology: Introduction to Object, Module, Cohesion, coupling, Reuse, Reuse case studies. Object Oriented analysis and Design, examples of Object methodologies.
6. Requirements Phase : techniques, Feasibility analysis, Prototyping, Testing during this phase, CASE tools for this Phase.
7. Specifications Phase: The specification document, structured systems analysis, semiformal techniques, ER Modeling , finite-state Machines, Petri Nets, Comparison of various techniques and CASE tools for specifications Phase.
8. Object – Oriented Analysis Phase : OO Paradigm vrs Structured paradigm, OO Analysis, OO life-Cycle Models, CASE tools for object-oriented Analysis phase. Case Study.
9. Design Phase: Data flow data structured oriented Design strategies, Action-oriented design, Data oriented design, jackson System development, Object-oriented design, Comparison of Action –oriented, Data oriented and object-oriented design, Real-time Systems design techniques. CASE tolls for the design phase.
10. Implementation phase: Choice of a Programming Language, 4^{th} generation languages, Coding standards, Team Approach, Scheduling, Portability and module Reuse , Module Test-case selection, Black-Box and Glass-Box Testing, Code walkthroughs, Testing objects. Issues in project management-team structure. CASE tools for the implementation.
11. Implementation and Integration Phase: Top-down, Bottom-up, sandwich, Implementation and Integration of Object- oriented products, Testing during R&I Phase Integration using a GUI, product, Acceptance Testing, CASE tools for I&I, CASE tools for complete Software process.
12. Maintenance Phase: Why maintenance is necessary, CASE tools for maintenance.

Practical Assignments shall be based on the theory above with JAVA as a test case.

References :

1. Stephen R Schach: Software engineering with JAVA, TMH, 1998 edition.
2. Roger S Pressman : Software engineering – A practitioner's Approach, 4th edition, 1996 McGraw-Hill.
3. J Martin : Rapid Application Development, prentice-Hall International.
4. B Meyer : Object Oriented software Construction, prentice-Hall.
5. G G Schulmeyer : Zero Defect software, McGraw – Hill ,1992.
6. J Rumbaugh et al : Object oriented Modeling and Design, Prentice-Hall, 1991.

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Semester - VIII

ECC 803 CO : Information Technology & Management

	Lecture	Tutorial	Practical
Teaching Hours	3	0	0
Examination Scheme Marks	100	00	Cont. Evaluation : 00 Examination : 00

1. Information Technology : Models and Principles : Systems & Information Theory- Users / Machine Systems – Database Management – logical / physical design.
2. Information Storage and Retrieval – content analysis, indexing search systems, library automation.
3. Information Systems Applications : Office automation, Communication, Intranet/Internet – Web centric business.
4. Information interfaces and presentation- multimedia information systems, user interfaces.
5. Ethical and social Impact of Information Systems.
6. Information security – threats and counter measures.
7. Electronic Banking, Electronic publishing , Electronic Polling Systems – on line Exam / monitoring / evaluation systems.
8. Standards / patents / Copyrights.

References:

1. M. Cook, Building Enterprise Information Architectures : Reengineering Information Systems, Prentice – Hall-1996.
2. D. Tapscott (Editor), Blueprint to the Digital Economy : Wealth Creation in the era of E-Business, McGraw-Hill – 1998.
3. K. Laudon, J. Laudon, Management Information Systems : New approaches to organization and technology, Prentice Hall India, 1998.

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Semester - VIII

ELECTIVE GROUP – I

1. ECC 811 CO : Artificial Intelligence & Robotics

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction to Artificial Intelligence – Problem Analysis and Representation – Basis Problem solving Methods and Best Search Methods – Structured Representation of Knowledge.

Fuzzy logic and applications – artificial neural networks – Expert systems and Robotics – Standards and Applications – Topics in Motion planning Algorithms and Complexity results for collision avoidance – the configuration space approach.

References:

1. Elaine Rich, K. Knight, Artificial Intelligence, Tata McGraw Hill.
2. Andrew C., Staugaard Jr., Robotics and AI : An Introduction to Applied machine Intelligence.
3. K. Boyer, L. Stsrk, H. Bunke, Applications of AI, Machine Vision and Robotics World Scientific Pub Co. – 1995.

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Semester - VIII

2. ECC 812 CO : Compilers for Advanced Architectures

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction to Compiler structure – Intermediate Representations – Code generation – resources, templates – Flow Analysis – Control Flow, Data Flow – dependence analysis and dependence graph.

Code optimizations – redundancy elimination, loop optimizations, procedure optimizations, register allocation, code scheduling, low-level optimizations, register allocation, code scheduling, low-level optimizations – Instruction scheduling and parallelization techniques.

Compiler Design and implementation for parallel computer systems – Vector pipelined, superscalar, SIMD, MIMD machines – Compiling issues for novel architecture with fine grain parallelism.

References:

1. Aho, sethi, Ullman, Compilers : Principles, Techniques, and Tools, Addison wesley – (first publication 1985)
2. N. Writh, Compiler Construction, Addison wesley – 1996.
3. S. Muchnick, Advanced Compiler design and Implementation, Academic press / Morgan Kaufmann – 1997.
4. M. Wolfe, L. ortega, C. Shaklin, High performance Compiler for parallel Computing, addison wesley – 1996.

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Semester - VIII

3. ECC 813 CO : Image Processing Techniques & Architectures

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction – Digital Image Processing – Applications – Image representation. Image file Formats – Review of Different Image File Structures. Image Transforms – 2-D Orthogonal & Unitary transforms – Convolution – DFT – FFT – DCT.

Image Enhancement – spatial Domain Methods & Frequency Domain Methods – Point Operation – Clipping and Thresholding – Digital Negative – Image Subtraction & Image Averaging – Histogram modeling – Spatial Operation – Low pass, High pass Median filtering & other filters – Magnification and Interpolation – Enhancement in Frequency Domain – Color Fundamentals & Models – Full – Color Image processing – Color Image Enhancement.

Image Filtering & Restoration – degradation Model – Circulant Matrices – Algebraic approach to Restoration – Inverse & Least mean square (Wiener) filtering – Filtering Using Image transforms – Constrained Least Squares Restoration.

Image analysis & Computer Vision – edge Detection – Boundary Extraction – Boundary Representation – Region Representation – Structure, Shape Features – Texture – Morphology – Scene Matching & Detection.

Image data Compression – Introduction – Image compression Models – Error free Compression Techniques – Standards – Transforms Coding Theory – Transform Coding of Image & different coding techniques.

References:

1. Rafael C. Gonzales and Richard E. Woods : Digital Image Processing, Addison Wesley Publishing Company, reprint 1993.
2. Anil K. Jain : Fundamental of Digital Image processing, PHI, EEE, 3rd Edition 1997.

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Semester - VIII

4. ECC 814 CO : Information Security & Applications

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction – Security Attacks on data / software, Hardware, Network.
Classical Encryption Techniques – Caesar Cipher, Monoalphabetic Ciphers, Polyalphabetic Classical Encryption techniques – Caesar Cipher, Monoalphabetic Ciphers, Polyalphabetic Ciphers, Transposition techniques – private key cryptography and Diffie – Hellman key exchange – Hashing and Digital Signatures – Authentication Protocols.

Network Security – firewall Design principles, IP security – security policy.

Introduction to E-Commerce – Electronic Voting / Polling systems – Standards and applications.

References:

1. William Stallings : Cryptography and Network security – Principles and Prentice Hall.
2. Bruce Scheneir : Applied Cryptography, John wiley.

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B.E.- IV (Computer Engg.)

Semester - VIII

5. ECC 815 CO : Natural Language Understanding

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction to Natural Language Understanding – Linguistic background: An outline of English syntax – Grammars and Parsing – Features and Augmented Grammars – Grammars for Natural Language – Toward Efficient Parsing – ambiguity Resolution: Statistical Methods: semantics and logical Form – Linking syntax and Semantics – ambiguity Resolution – other Strategies for semantic Interpretation – scoping and the Interpretation of Noun phrases – Knowledge Representation and Reasoning – Local Discourse Context and Reference – Using World Knowledge – discourse structure.
Defining a Conversational Agent – A Basic Conversation Processor – The Processes in a Conversation processor – Knowledge in a Conversation Processor – Conversation processor and Natural language processors – Problems in Language Understanding for language Processors – Resolving Ambiguous Meaning – Resolving Grammar Problems – Semantic analysis of semantic Items – semantic analysis in natural language Processing – Generating Questions – semantic Contains Semantic Constraints in a Conversation Processor – handling Diverse Types of Input Sentences – Types of Sentences – Processing Texts in a natural Language Processor Processing Texts in a Conversation Processor – Incorporating Text Understanding in to Conversation Processor - Incorporating Text Understanding in to Conversations Processor – Debugging your Conversations Processor.

References:

1. James Allen : Natural Language Understanding, Addison-wesley Pub Co, 2nd edition 1995.
2. Jan Van Bakel automatic semantic Interpretation : A Computer Model of Understanding Natural Language.
3. Russell Suereth : Developing Natural Language Interfaces : Processing Human Conversations, McGraw Hill, 1997.

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B.E.- IV (Computer Engg.)

Semester - VIII

6. ECC 816 CO : Parallel Processing & Architectures

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction to parallel Processing – Generation of parallel Computers – Architectural Classifications schemes – parallel Processing applications – Memory sub Systems and Input output management – Pipelining and vector Processing – Interconnection Networks and array processors.

Multi – processor architecture and programming – parallel Programming language and Environment.

Data flow Computers – static data flow, Dynamic Dataflow architecture – advance topics.

References:

1. Kai Hwang, F. Briggs, Computer architecture and parallel Processing, Mc-Graw Hill .
2. M. Flynn, computer Architecture, Narosa Publishing.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VIII

1. ECC 821 CO : Advanced Database Systems

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction : Objectives and Review of the basic concepts – The Object – oriented data Model – Object oriented databases = ODMG – Nested Relation Model.

Database System architectures : Centralized systems – Client – Server systems – Parallel systems, Distributed systems – Network Types. Parallel Databases parallelism – Inter – query and Intra-query Parallelism – Inter – operation & Intra-operation parallelism – Design of parallel Systems. Distributed Databases_: Distributed DBMS Implementations. Features of Distributed client/server DBMS. Advanced RDBMS Features, RDBMS Reliability and Availability Robustness – Consistency fault Tolerance. RDBMS Administration. Distributed data storage-Distributed query Processing – Distributed Transaction model – Commit Protocols – Concurrency control – Deadlock handling. Multi – Database connectivity standards – Concept of the Middle – ware Product.

Web Enabled Applications: Review of 3-tier architecture – The middle – ware – Typical Middle – ware products and their usage. Architectural support for 3 – tier applications : technologies like RPC, CORBA, Com. Web Application server – WAS architecture – Concept of Data Cartridges – JAVA/HTML components. WAS security.

Special Topics: Security and Integrity, Standardization, Performance Benchmarks, Performance Tuning, time in Databases, User Interfaces, Active databases.

Data & web warehousing: data Ware house Definition and Characteristics data warehouse architecture, Client/Server Computing Model & data Warehousing. Query and Reporting Tools – Applications – OLAP & Tools – data Mining & Tools – data Visualization – Data Marts – Data Warehouse Administration and management. Data warehouse Design Considerations – Tools, performance Considerations – data Warehouse & DBMS Specialization – Mapping the Data Warehouse to a Multiprocessor architecture – data partitioning.

Multi-relational OLAP, MOLAP, ROLAP – Managed Query Environment (MQE), OLAP Tools and the Internet.

References:

1. A Silberschatz, Henry Korth, S Sudarshan : Database systems Concepts, McGraw Hill, 3rd Ed, 1997.
2. Alex Berson, Stephen J. Smith : Data warehousing, data Mining, and OLAP, (McGraw Hill series on data warehousing and data management 1998.
3. R Sigmore, M O Stegman, J Creamer : The ODBC solution, McGraw Hill 1995.
4. Mattison , Rob Mattison : Web Data Warehousing and Knowledge Management. (Data Management) McGraw Hill,1999.
5. Technical Notes and Literature on the Oracle Web – site.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VIII

B. V. IV (Computer Engg) –8th semester (New scheme)
2. ECC 822 CO : Advanced Operating Systems

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Overview, Synchronization Mechanisms, Process Deadlocks, architecture of Distributed Systems, Theoretical Foundations. Distributed Mutual Exclusion – Distributed Deadlock Detection – Agreement protocols – Distributed File Systems Distributed Shared Memory – Distributed scheduling – Recovery – Fault Tolerance. Resource security and Protection : access and Flow Control.

Data security : Cryptography – Multiprocessor systems architecture – Multiprocessor Operating systems. Introduction to database Operating Systems – Concurrency Control : Theoretical Aspects – Concurrency Control algorithms. Micro-Kernel architecture based Operating Systems.

Operating Systems based on Object Oriented approach and their design.

References:

1. Mukesh Singhal, Niranjan G. shivaratri (Contributor) : advanced Concepts in Operating Systems : Distributed database, and Multiprocessor Operating Systems, McGraw – Hill series in Computer science,1994.
2. Crawley : Operating systems : An Object oriented Approach, McGraw Hill, 1998.
3. A S Tanenbaum : Modern Operating Systems, Prentice – Hall, EEE,1993.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VIII

3. ECC 823 CO : Decision Support systems

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Overview of Management support Systems; Decision Making, systems, Modeling and Support; Overview of decision support systems; Modeling and Model Management; User Interface; types of Decision support Systems viz. Organization DSS, Enterprise Decision support systems, Executive Information and Support system; Constructing Decision Support Systems;. Knowledge-based DSS, knowledge management Techniques for decision support; Artificially Intelligent DSS, Expert Systems, Knowledge Representation; Artificial Neural Networks. Decision support and data & web warehousing.

References:

1. Efraim Turban, jay E. Aronson : Decision support systems and Intelligent Systems, PHI, 5th Ed 1998.
2. Clyde W. Hosapple, Andrew B. Whinston : Decision Support Systems : A Knowledge – Based Approach,1996.
3. Andrew P. Sage : Decision Support Systems Engineering , Wiley Series in Systems Engineering, 1991.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VIII

4 ECC 824 CO : Distributed Programming Environment

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction to Distributed Computing Distribution of Data and Control: Clock synchronization, distributed termination problem, load distribution, distributed elections, agreement problem. Deadlocks in distributed Systems. Introduction to Fault – tolerant computing.

High level language support for distributed computing: message passing primitives, atomic actions, RPC mechanisms. Implementation of These features. Case study of some distributed languages as well as distributed programming architectures like LINDA and CORBA, COM etc.

References:

1. G F Colouris and J Dollimore: Distributed Systems: Concepts & Design, Addison Wesley, 1988.
2. S Mullender (Ed): Distributed Systems, Addison Wesley,1989.
3. Research papers from current journals.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VIII

5 ECC 825 CO : Knowledge Based Management Systems

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction to Knowledge –Based systems System and expert Systems – Structure of KBS – Knowledge- Centered problem Solving Strategies – Search Methods – Knowledge Representation. Logic and Automated Reasoning – Rule – Based Systems Forward & Backward-Reasoning Systems – Analogical and Case-Based Reasoning – Qualitative Reasoning. Associative networks – Frames, and Objects – Uncertainty management. Advanced Reasoning Techniques.

The Software Lifecycle in Knowledge – based systems. Feasibility Analysis. Requirements Specification and Design. Knowledge Acquisition and system Implementation. Practical Considerations in Knowledge Acquisition – alternative Knowledge Acquisition Means. Project management. Knowledge Based Management systems like The CLIPS Systems and The Personal Consultant shell Systems.

Impact of the web on the Knowledge management.

References:

1. Ram D. Sriram : Intelligent Systems for Engineering : A Knowledge – Based Approach, Spinger Verlag; August 1997)
2. Avelino J. Gonzalez, Douglas D : The Engineering of Knowledge – Based Systems : Theory and Practice Book and 2 Disks, Prentice-Hall, 1994.
3. Sabrina Sestito, Tharam S. Dillon : Automated Knowledge Acquisition, Prentice Hall.
4. International Series in Computer systems science and engineering, 1995.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VIII

6 ECC 826 CO : Systems Analysis & Simulation

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

Introduction - Systems, Models, and simulation – Random Number Generators – Discrete – event simulation – simulation of single – server Queuing system and simulation of Inventory System – distributed Simulation – Combined Discrete-Continuous simulation and Monte Carlo simulation – Complex systems Modeling – Time shared Computer Model, Job-Shop Model – Simulation software – General purpose and Specially designed software/Language – simulation simulation of manufacturing Systems – standards and Applications.

References:

1. Law A., Kelton W., Simulation Modeling & analysis, McGraw-Hill.
2. Gordon G., System simulation, Prentice Hall India.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- IV (Computer Engg.)

Semester - VIII

ECC 804 CO : Project
B. V. IV (Computer Engg) –8th semester (New scheme)

	Lecture	Tutorial	Practical
Teaching Hours	0	0	8
Examination Scheme Marks	-	-	Cont. Evaluation : 80 Examination 120

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