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**			

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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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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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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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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.

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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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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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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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