B.Tech Semester IV (Computer Engineering)

Subject Code	Subject name	Teaching Scheme				Credit			Examination Scheme (Marks)				
									Theory			Prac /Tw	Total
		Lect Hrs	Tu Hrs	Prac Hrs	Total	Theory	Pra/Tw	Total	Int. Asse.	Sem. End Marks	Sem. End Hrs		
2HS401	DISCRETE MATHEMATICS	3	0	0	3	3	0	3	30	70	3	-	100
2CE402	OPERATING SYSTEMS	3	0	2	5	3	1	4	30	70	3	50	150
2CE403	DATA STRUCTURE	3	0	2	5	3	1	4	30	70	3	50	150
2CE404	BASIC OF COMMUNICATION SYSTEMS	3	0	2	5	3	1	4	30	70	3	50	150
2CE405	DBMS-II	3	0	2	5	3	1	4	30	70	3	50	150
2CE406	APPLICATION DEVELOPMENT TOOLS	3	0	2	5	3	1	4	30	70	3	50	150
2OE407	FOREIGN LANGUAGE	2	0	0	2	2	0	2	15	35	2	-	50
TOTAL		20	0	10	30	20	5	25	195	455	20	250	900

2HS401: DISCRETE MATHEMATICS

Teaching Scheme				Credit			Examination Scheme (Marks)				
							Theory			Pracitcal /Tw	Total
Lect Hrs	Tu Hrs	Prac Hrs	Total	Theory	Pra/Tw	Total	Int. Asse.	Sem. End Marks	Sem. End Hrs		
3	0	0	3	3	0	3	30	70	3	-	100

Predicate Calculus :
Introduction, Objectives, Predicates, Statement Functions, Variable and Quantifiers, Free and Bound Variables, Special Valid Formulas Involving Quantifiers - Theory Of Inference For The Predicate Calculus.

Fuzzy Sets:
Some Useful Definitions, Basic Operations On Fuzzy Sets Image and Inverse Images, I-V Fuzzy Sets, Fuzzy Relations.

Group Theory :
Definition and Examples Of Semigroups, Monoids and Groups. Abelian Group, Cyclic Group;Subgroup,Permutation Groups, Coset Decomposition Of Groups, Normal Subgroups, Lagranges Theorem.

Lattices :
Poset, Lattice As A Poset, Properties Of Lattices, Lattices as Algebraic Systems, Sublattices, Direct Produce and Homomorphism, Complete Lattices, Bounds Of Lattices, Distributive Lattices, Complemented Lattice.

Boolean Algebra :
Introduction, Definition and Properties, Sub-Boolean Algebra Direct Product and Homomorship, Atoms, Stone's Representation Theorem. Boolean Expressions and Their Equivalences. Minterm and Max Terms. Boolean Algebra, Values Of Boolean Expressions, Canonical Forms, Boolean Functions, Symmetric Boolean Functions.

Graph Theory :
Basic Concept of Graph Theory, Basic Definitions. Path,Reachability and Connectedness ,Matrix Representation Of Graphs, Trees

Reference Books:

1. Discrete Mathematical Structures With Application To Computer Science
   By Tremblay, J.P. & Manohar ,Mcgraw Hill - New Delhi
2. Discrete Mathematics and Its Applications
   By Rosen,Kenneth L.Mcgraw Hill - New Delhi
3. Applied Discrete Structures For Computer Science
   By Alan Doerr & Kenneth , Galgotia Publications Pvt.Ltd. New Delhi
4. Discrete Mathematical Structures For Computer Science
   By Kolman, B& Busby R.C,Prentice Hall Of India Pvt Ltd.,New Delhi
5. Fuzzy Sets and Fuzzy Logic. Theory and Applications
   By Georgr J. Klir/Bo Yuan

2CE402: OPERATING SYSTEMS

Teaching Scheme				Credit			Examination Scheme (Marks)				
							Theory			Pracitcal /Tw	Total
Lect Hrs	Tu Hrs	Prac Hrs	Total	Theory	Pra/Tw	Total	Int. Asse.	Sem. End			
								Marks	Hrs		
3	0	2	5	3	1	4	30	70	3	50	150

Introduction To OS:
OS Services and Kernel, Batch OS, Multiprogramming and Time Sharing, Multiprocessing, Operating System structures

Process Management:
Process Concepts, Interprocess communication, Classical IPC Problems, Threads Concepts, Process Scheduling.

Deadlocks :

Memory Management:
Swapping, Paging and Segmentation, Virtual Memories, Page replacement Algorithms, Modelling paging Algorithms, Design Issues for paging systems

I/O and Device Management:

File Management:

Case study:
Linux

Reference Books:

1.Operating System Concepts
By A Silberschatz and Peter B Galvin Addision-Wesley
2. Modern Operating Systems
By Andrew s Tanaunbaum ,PHI
3. Operating Systems
By William Stallings, PHI

2CE403: DATA STRUCTURE

Teaching Scheme				Credit			Examination Scheme (Marks)				
							Theory			Pracitcal /Tw	Total
Lect Hrs	Tu Hrs	Prac Hrs	Total	Theory	Pra/Tw	Total	Int. Asse.	Sem. End			
								Marks	Hrs		
3	0	2	5	3	1	4	30	70	3	50	150

Introduction to Data Structures:

Linear Data Structures:
The stack:
Introduction, Representing stack in C++, Infix, Postfix, Prefix notation of expression.

The Queue:
The queue and its sequential representation, Priority Queue.

Linked Lists:
Creating Linked list, Inserting and removing Nodes from a list, Linked Implementation of stacks and queue, Link list as a data structure, circular list, Doubly linked list.

Tree:
Binary trees, Binary tree representation, Binary tree traversals, Threaded binary tree, List as binary tree, Tree and their applications

Sorting :
Elementary sorts: Bubble sort, Quick sort, selection sort, tree sorting, insertion sort, merge sort, radix sort
Worst case and average behavior

Searching:
Basic search techniques- Sequential searching, Binary search, Tree searching, General tree searching – multiway search tree,B-tree, introduction to B+ Tree, Hashing.

Graph And Their Application:
Graph, linked list representation of graph, Graph traversal and spanning forests

Reference Books:

1. Data Structures Using C and C++
   By Langsam, Augenstein, Tenenbaum
2. Data Structures, An Object-Oriented Approach
   By Collins, W.J
3. An Introduction To Data Structures With Application
   By Tremblay, J.P., P.G. Sorenson

2CE404: BASICS OF COMMUNICATION SYSTEMS

Teaching Scheme				Credit			Examination Scheme (Marks)				
Lect Hrs	Tu Hrs	Prac Hrs	Total	Theory	Pracitcal /Tw	Total	Theory			Pracitcal /Tw	Total
3	0	2	5	3	1	4	Int. Asse.	Sem. End Marks	Hrs	50	150
							30	70	3		

Introduction

Data Communications, Networks, Data Representation, Data Flow, Distributed Processing, Network Criteria, Physical Structures, Network Models, Categories of Networks, Intranet, The Internet, Protocols and Standards

Network Models

Layered Tasks, Sender, Receiver and Carrier Hierarchy, The OSI Model, Layers in the OSI Model, TCP/IP Protocol suit, Addressing – Physical, Logical, Port and Specific Addresses

Data and Signals

Analog and Digital Signals, Periodic and Non-periodic Signals, Sine Wave, Phase, Wavelength, Time and Frequency Domains, Composite Signals, Bandwidth, Bit Rate, Bit Length, Transmission of Digital Signals, Transmission Impairment, Data Rate Limits, Performance – Bandwidth, Throughput, Latency, Bandwidth-Delay Product, Jitter

Digital Transmission

Digital-to-Digital Conversion, Line Coding, Line Coding Schemes, Block Coding, Scrambling, Analog-to-Digital Conversion, PCM, DM, Transmission Modes – Parallel and Serial Transmission

Analog Transmission

Digital-to-Analog Conversion, Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying, Quadrature Amplitude Modulation, Analog-to-Analog Conversion, Amplitude Modulation, Frequency Modulation, Phase Modulation

Bandwidth Utilization : Multiplexing and Spreading

Frequency-Division Multiplexing, Wavelength-Division Multiplexing, Synchronous and Statistical Time-Division Multiplexing, Spread Spectrum

Transmission Media

Guided Media – Twisted Pair, Coaxial and Fiber-Optic Cable, Unguided Media – Radio Waves, Micro Waves and Infrared

Switching

Circuit-Switched Networks, Telephone Networks, Datagram Networks, Routing Table, Datagram Networks, Virtual-Circuit Networks, Structure of a Switch

Telephone and Cable Networks for Data Transmission

Telephone Network, Dial-up Modems, Digital Subscriber Line, Cable TV Networks, HFC Network, CM and CMTS, DOCSIS

Reference Books:

1. **Data Communication and Networking – 4th Edition**
   By – Behrouz A Forouzan
2. **Data and Computer Communications – 7th Edition**
   By – William Stalling
3. **Computer Networks – 4th Edition**
   By – Andrew S Tanenbaum

2CE405: DBMS-II

Teaching Scheme				Credit			Examination Scheme (Marks)				
							Theory			Pracitcal /Tw	Total
Lect Hrs	Tu Hrs	Prac Hrs	Total	Theory	Pra/Tw	Total	Int. Asse.	Sem. End			
								Marks	Hrs		
3	0	2	5	3	1	4	30	70	3	50	150

Query Processing:
Overview, Measures of Query Cost

Query Optimization :
Overview

Concurrency Control :
Lock-Based Protocols, Time Stamp – Based Protocols, Multiple Granularity * ,Deadlock Handling

Recovery System :
Failure Classification, Storage Structure, Recovery and Atomicity, Log – Based Recovery, Shadow Paging

Database System Architecture :
Centralized and Client-Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems

Distributed Databases :
Homogeneous and Heterogeneous Databases, Distributed Data Storage, Distributed Transactions, Commit Protocols

Indexing And Hashing:
Basic Concepts, Ordered Indices, B^+ - Tree Index Files, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Index Definition in SQL, Multiple-Key Access

Introduction to Data Mining & Data warehousing

Implementation Of Transaction & Concurrency Concepts Using PL SQL

Reference Books:

1. Database System Concepts : Fourth Edition
   By Silberschatz, Korth, Sudarshan.
2. An Introduction to Database Systems :Seventh Edition
   By C. J. Date
3. SQI, PI/SQL The Programing Language of ORACLE : 2nd Edition
   By Ivan Bayross.

2CE406: APPLICATION DEVELOPMENT TOOLS

Teaching Scheme				Credit			Examination Scheme (Marks)				
							Theory			Pracitcal /Tw	Total
Lect Hrs	Tu Hrs	Prac Hrs	Total	Theory	Pra/Tw	Total	Int. Asse.	Sem. End Marks	Sem. End Hrs		
3	0	2	5	3	1	4	30	70	3	50	150

Introduction:
The Windows Graphical User Interface, Procedural, Event Driven, and Object Oriented Programming languages.

Introduction To .Net Framework:
The Common Language Runtime, Elements of a .NET application, Versioning and deployment, Memory management, Cross language Integration

The Visual Studio Environment:
The IDE Start Page, The New Project Dialog, The IDE Main Window, The Toolbars, The Document Window, The Form Designer, The Solution Explorer Window, The Properties Window, The Toolbox, Help, Design Time, Run Time, and Break Time

Variables, Constants And Calculations:
Data: Variables and Constants, Arrays, Scope of variables, Calculations, Formatting Data, Handling Exceptions

Working With Controls:
Using command buttons, text boxes, labels, picture box, image box, list box, combo box, file list box, drive and dir list boxes, scroll bars, rich text box, timer, shape, frames, checkbox, radio button.

Decisions Making, Loops And Debugging:
If Statements, Conditions, Nested If Statements, Select statement, Input Validation, Do/Loops, For/Next Loops, Calling Event Procedures, Debugging Visual Basic Projects.

Sub Procedures, And Functions:
Creating Context Menus, working with toolbar, Writing General Procedures.

Working With ADO.Net:
Understanding connection, Adapter, commands, Tables, Views and Data Readers.

References Books:

1. Professional VB.NET 2003 Wrox Publications
2. Professional ASP.NET 2003 Wrox Publications