

ANNA UNIVERSITY TIRUCHIRAPPALLI

Tiruchirappalli-620024

B.E. (PART TIME) COMPUTER SCIENCE AND ENGINEERING

Regulations 2007

Curriculum

(Applicable to the students admitted from the Academic year 2007 – 2008 onwards)

SEMESTER I

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	MA4101	Mathematics I	3	0	0	100
2	HS4101	Physical Sciences	3	0	0	100
3	CS4101	Programming and Data Structures	3	0	0	100
4	EC4102	Electronic Circuits and Devices	3	0	0	100
Practical						
5	CS4102	Data Structures Laboratory	0	0	3	100

SEMESTER II

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	MA4151	Mathematics II	3	0	0	100
2	CS4151	Object Oriented Programming	3	0	0	100
3	CS4152	Computer Architecture	3	0	0	100
4	CS4153	Database Management Systems	3	0	0	100
Practical						
5	CS4154	DBMS Laboratory	0	0	3	100

SEMESTER III

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	EE4205	Electrical Engineering and Control Systems	3	0	0	100
2	EC4205	Microprocessors and Microcontrollers	3	0	0	100
3	CS4201	Operating Systems	3	0	0	100
4	CS4202	System Software	3	0	0	100
Practical						
5	CS4203	System Programming Laboratory	0	0	3	100

SEMESTER IV

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	MA4251	Probability and Queuing Theory	3	0	0	100
2	CS4251	Object Oriented Analysis and Design	3	0	0	100
3	CS4252	Software Engineering	3	0	0	100
4	CS4253	Data Communication and Computer Networks	3	0	0	100
Practical						
5	CS4254	Computer Networks Laboratory	0	0	3	100

SEMESTER V

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	CS4301	Principles of Compiler Design	3	0	0	100
2	CS4302	Graphics and Multimedia	3	0	0	100
3	CS4303	Web Technology	3	0	0	100
4	CS4304	Data Warehousing and Mining	3	0	0	100
Practical						
5	CS4305	Web Technology Laboratory	0	0	3	100

SEMESTER VI

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	MG4351	Total Quality Management	3	0	0	100
2	CS4351	Mobile Computing	3	0	0	100
3	CS4352	Security in Computing	3	0	0	100
4	E1****	Elective I	3	0	0	100
Practical						
5	CS4353	Software Development Laboratory	0	0	3	100

SEMESTER VII

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	CS4401	Artificial Intelligence	3	0	0	100
2	CS4402	Principles of Programming Languages	3	0	0	100
3	CS4403	Scientific Computing Technique	3	0	0	100
4	E2****	Elective II	3	0	0	100
5	E3****	Elective III	3	0	0	100
6	E4****	Elective IV	3	0	0	100
Practical						
7	CS4405	Project Work	0	0	3	100

LIST OF ELECTIVES

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	CS4001	Knowledge Management	3	0	0	100
2	CS4002	Unix Internals	3	0	0	100
3	CS4003	Soft Computing	3	0	0	100
4	CS4004	Advanced Java Programming	3	0	0	100
5	CS4005	Real Time Systems	3	0	0	100
6	CS4006	Advanced Database Technology	3	0	0	100
7	CS4007	TCP/IP Design and Implementation	3	0	0	100
8	CS4008	C# and .NET Technology	3	0	0	100
9	CS4009	Data Warehousing and Data Mining	3	0	0	100
10	CS4010	High Speed Networks	3	0	0	100
11	CS4011	Component Based Technology	3	0	0	100
12	CS4012	Embedded Systems	3	0	0	100
13	CS4013	Software Testing and Quality Assurance	3	0	0	100
14	CS4014	Software Project Management	3	0	0	100
15	CS4015	Visual Programming	3	0	0	100
16	CS4016	XML and Web Services	3	0	0	100
17	CS4017	Design and Analysis of Algorithms	3	0	0	100
18	CS4018	Distributed Systems	3	0	0	100
19	EC4253	Digital Signal Processing	3	0	0	100

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Syllabus

(Applicable to the students admitted from the Academic year 2007 – 2008 onwards)

SEMESTER I

MA4101 – MATHEMATICS I

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UNIT I MATRICES			9
Characteristic Equation – Eigen Values and Eigen Vectors of a Real Matrix – Properties of Eigen Values – Problem Solving Using Cayley – Hamilton Theorem – Similarity Transformation – Orthogonal Transformation of a Symmetric Matrix to Diagonal Form – Quadratic Form – Orthogonal Reduction to its Canonical Form.			
UNIT II THREE DIMENSIONAL GEOMETRY			9
Angle between Two Lines – Coplanar Lines – Shortest Distance between Skew Lines – Equation of a Sphere – Plane Section of a Sphere – Tangent Plane – Equation of a Cone – Right Circular Cone.			
UNIT III DIFFERENTIAL CALCULUS			9
Curvature – Cartesian and Parametric Co-ordinates – Centre and Radius of Curvature – Circle of Curvature – Envelopes – Evolutes.			
UNIT IV FUNCTIONS OF SEVERAL VARIABLES			9
Partial Derivatives – Euler's Theorem for Homogeneous Functions – Total Derivative – Differentiation of Implicit Functions – Jacobians – Maxima / Minima for Functions of Two Variables – Method of Lagrange's Multipliers – Taylor's Expansion.			
UNIT V ORDINARY DIFFERENTIAL EQUATIONS (ODE)			9
Solution of Second and Higher Order Linear ODE with Constant Coefficients – Simultaneous First Order Linear Equations with Constant Coefficients – Linear Equations of Second Order with Variable Coefficients – Cauchy's and Legendre's Linear Equations – Method of Reduction Order.			
			Total: 45

TEXT BOOK

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty Eighth Edition, Khanna Publishers, New Delhi, 2005.

REFERENCES

1. Glyn James., "Advanced Modern Engineering Mathematics", Third Edition, Pearson Education Ltd, New Delhi, 2004.
2. Venkataraman. M. K., "Engineering Mathematics", Volume I and II Revised Enlarged Fourth Edition, The National Publishing Company, Chennai, 2004.
3. Veerarajan. T., "Engineering Mathematics (for first year)", Fourth Edition, Tata McGraw Hill Publishing Company Limited, New Delhi, 2005.
4. V. Sundaram, R. Balasubramanian and K.A. Lakshminarayanan, "Engineering Mathematics", Fifth Edition, Vikas Publishing house Pvt. Ltd., New Delhi, 2006.

GS4101 – PHYSICAL SCIENCES

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UNIT I PROPERTIES OF MATTER AND HYDRODYNAMICS 9

Properties of Matter – Stress – Strain – Hooke's Law – Types of Moduli of Elasticity – Torsional Pendulum – Determination of Rigidity Modulus of a Wire – Bending of Beams – Expression for Bending Moment – Measurement of Young's Modulus by Uniform and Non-Uniform Bending.

Hydrodynamics – Stream Line Flow – Turbulent Flow – Poiseuille's Formula for Flow of Liquid through a Capillary Tube – Determination of Coefficient of Viscosity of a Liquid.

UNIT II OPTICS AND PHOTOELASTICITY 9

Interference – Air Wedge – Testing of Flat Surfaces – Michelson's Interferometer – Types of Fringes – Applications – Wavelength Determination – Thickness of a Transparent Medium
Optical Instruments – Metallurgical Microscope and Scanning Electron Microscope – Applications.

Photo Elasticity – Theory of Photo Elasticity – Stress Optic Law – Isoclinic and Isochromatic Fringes – Photoelastic Bench and its Use.

UNIT III SEMICONDUCTING AND SUPERCONDUCTING MATERIALS 9

Intrinsic Semiconductor – Expressions for the Carrier Concentration – Calculation of Density of Holes and Electrons – Fermi Level and its Variation with Temperature – Determination of Band Gap Energy.

Extrinsic Semiconductors – Carrier Concentration in N-Type and P-Type Semiconductors (No Derivation – Qualitative) – Variation of Fermi Level with Temperature and Impurity Concentration – Hall Effect – Determination of Hall Coefficient

Super Conductors – Superconductivity – Properties – Meissner Effect – Type I and Type II Superconductors – High Temperature Super Conductors – Applications – Magnetic Levitation – Josephson Effect – SQUID.

UNIT IV WATER TREATMENT PROCESS 9

Hardness of Water – CaCO_3 Equivalents – Ethylene Diamine Tetra- Acetic Acid (EDTA) Method of Estimation of Hardness – Troubles of Boiler Feed Water – Demineralization – Zeolite Process – Desalination – Reverse Osmosis – Electro Dialysis – Water Conditioning (Colloidal, Phosphate, Calgon, Carbonate) – Treatment Of Domestic Water (UV And Ozone).

UNIT V THERMODYNAMICS 9

Thermodynamic Processes – First Law of Thermodynamics – Limitations – Second Law of Thermodynamics – Clausius and Kelvin Statement – Entropy – Mathematical Expressions – Changes in Entropy for Isothermal Expansion – Reversible and Irreversible Processes – Free Energy – Gibbs Helmholtz Equation – Application and Simple Problems – Van't Hoff Isotherm and Isochore – Simple Problems.

Total: 45

TEXT BOOKS

1. Avadhanulu M.N. and Kshirsagar P.G., "A Text Book of Engineering Physics", Seventh Enlarged Revised Edition, S.Chand & Company Ltd., 2005.
2. Gaur R.K. and Gupta S.L., "Engineering Physics", Dhanpat Rai Publishers, New Delhi, 2001.
3. P.C. Jain and Monika Jain, "Engineering Chemistry", Thirteenth Edition, Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2004.

REFERENCES

1. Pillai S.O., "Solid State Physics", Sixth Edition, New Age International Publications, New Delhi, 2005.
2. Arumugam M., "Engineering Physics", Second Edition, Anuradha Agencies, Kumbakonam, 2005.
3. Palanisamy P.K., "Physics for Engineers", Second Edition, Scitech Publications (India) Pvt. Ltd., Chennai, 2005.
4. J.C. Kuriakose and J. Rajaram, "Chemistry in Engineering and Technology", Volume 1 & 2, Tata McGraw Hill Publishing Company (P) Ltd., New Delhi, 1996.
5. B.K. Sharma, "Engineering Chemistry", Krishna Prakasam Media (P) Ltd., Meerut, 2001.

CS4101 – PROGRAMMING AND DATA STRUCTURES

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UNIT I PROBLEM SOLVING – LISTS, STACKS AND QUEUES 9

Problem Solving Techniques and Examples – Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT.

UNIT II TREES 9

Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – B– Trees.

UNIT III HASHING AND PRIORITY QUEUES 9

Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing – Priority Queues (Heaps) – Model – Simple Implementations – Binary Heap – Application of Priority Queues.

UNIT IV SORTING 9

Preliminaries – Insertion Sort – Shell Sort – Heap Sort – Merge Sort – Quick Sort – External Sorting.

UNIT V GRAPHS 9

Definitions – Topological Sort – Shortest– Path Algorithms – Minimum Spanning Tree – Applications of Depth – First Search.

Total: 45

TEXT BOOKS

1. M. A. Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education Asia, 2002.
2. R. G. Dromey, "How to Solve it by Computer", PHI, 2002.

REFERENCES

1. Brian W. Kernighan and Rob Pike, "The Practice of Programming", Pearson Education Asia, 1999.
2. Aho, J. E. Hopcroft and J. D. Ullman, "Data Structures and Algorithms", Pearson Education Asia, 1983.
3. Thomas H. Cormen, Charles E. Leiserson and Ronald L. Rivest, "Introduction to Algorithms", Second Edition, PHI, 2002.
4. Y. Langsam, M. J. Augenstein and A. M. Tenenbaum, "Data Structures using C", Pearson Education Asia/ PHI, 2004.

EC4102 – ELECTRONIC CIRCUITS AND DEVICES

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UNIT I DIODES AND BIPOLAR JUNCTION TRANSISTOR 9

PN Junction – Current Equation – Junction Capacitance – Breakdown Characteristics – Varactor – Tunnel – Fast Recovery – Schottky and Zenar Diodes – Ebers– Moll Equation – Input Output Characteristics – Switching Characteristics – 'H' Parameters – Low Frequency and High Frequency Equivalent Circuits – RF Transistors.

UNIT II POWER SEMICONDUCTOR DEVICES 9

Structure, Operation and Characteristics Of SCR – TRIAC – Power Transistor – MOSFET – GTO – IGBT – Turn On and Turn Off Characteristics – Switching Losses.

UNIT III AMPLIFIERS 9

Biasing Circuits for Transistors – FET and Their Analysis – Low Frequency and High Frequency Equivalent Circuits – CE, CC and CB Amplifiers – FET Amplifiers – Frequency Response – Cascade and Darlington Connections – Analysis of Class A And B Power Amplifiers – Complementary Symmetry Amplifiers – Class C Power Amplifiers.

UNIT IV DIFFERENTIAL AND TUNED AMPLIFIERS 9

Differential Amplifiers – Common Mode and Difference Mode Analysis – Drift Compensation – FET Input Stages – Chopper Stabilizer Amplifiers – Basics of Tuned Amplifiers.

UNIT V FEEDBACK AMPLIFIERS AND OSCILLATORS 9

Advantages of Negative Feedback – Voltage / Current, Series / Shunt Feedback – Positive Feedback – Condition for Oscillations – Phase Shift – Wien Bridge, Hartley, Colpitts and Crystal Oscillators.

Total: 45

TEXT BOOKS

1. Millman and Halkias, "Electronic Devices and Circuits", Tata McGraw Hill, 1991.
2. Albert Paul Malvino, "Electronics Principles", Sixth Edition, Tata McGrawHill, 1995.

REFERENCES

1. David A.Bell, "Electronic Devices and Circuits", Third Edition, PHI, 1999.
2. Sze, S.M, "Physics of Semiconductor Devices", Wiley Eastern, 1981.
3. Boylestad and Nashelsky, "Electronic Devices and Circuit Theory", Sixth Edition, PHI, 1999.
4. Mothersheed, "Electronic Devices and Circuits", PHI, 1999.
5. John D.Rydar, "Electronic Fundamentals and Applications Integrated and Discrete Systems", Fifth Edition, PHI, 1999.
6. David Neamen, "Semiconductor Physics and Devices Basic Principles", Tata McGraw Hill, 1999.

CS4102 – DATA STRUCTURES LABORATORY

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1. Array Implementation of List Abstract Data Type (ADT).
2. Linked List Implementation of List ADT.
3. Cursor Implementation of List ADT.
4. Stack ADT – Array and Linked List Implementations.

5. The Next Two Exercises are to be done by implementing the Following Source Files.
 - a) Program Source Files for Stack Application.
 - b) Array Implementation of Stack ADT.
 - c) Linked List Implementation Of Stack ADT.
 - d) Program Source Files for Stack Application.
An Appropriate Header File for the Stack ADT Should Be Included In (A) And (B).
 - (i) Implement Any Stack Application Using Array Implementation Of Stack ADT.(By Implementing Files (A) And (B) Given Above) And Then Using Linked List.
 - (ii) Implementation of Stack ADT (By Using Files (A) and Implementing File (C))
 - (iii) Implement Another Stack Application Using Array And Linked List.
 - (iv) Implementations Of Stack ADT (By Implementing Files (D) And Using File (B), And Then By Using Files (D) And (C)).

6. Queue ADT — Array and Linked List Implementations.
7. Search Tree ADT – Binary Search Tree.
8. Hash Table — Separate Chaining.
9. Implement an Interesting Application as Separate Source Files and Using any of the Searchable ADT Files Developed Earlier. Replace the ADT File alone with other appropriate ADT Files. Compare the Performance.
10. Heap Sort.
11. Quick Sort.

Total: 45

CS4151 – OBJECT ORIENTED PROGRAMMING

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UNIT I FUNDAMENTALS 9

Object Oriented Programming Concepts – Software Evaluation – Encapsulation – Data Abstraction – Dynamic Binding – Message Passing – Programming Elements of C++ – Program Structure – Arrays – Class – Union – Structure of C++ – Tokens – Expressions and Control Structures of C++.

UNIT II FUNCTIONS & CLASSES 9

Function Prototyping – Call by Reference – Inline Function – Default and Const Arguments – Function Overloading – Friend Function – Virtual Functions – Constructors – Types of Constructor – Destructors – Classes and Objects – Defining – Data Hiding – Memory Allocation of Objects – Static Data Member – Array of Objects – Friend Class.

UNIT III OPERATOR OVERLOADING AND INHERITANCE 9

Operator Overloading – Unary and Binary Operators Overloading – Use of Friend Function in Overloading – Manipulation of Strings and Overloading – Inheritance – Single – Multilevel – Multiple – Hierarchical and Hybrid Inheritances – Virtual Base Class – Abstract Class – Constructors in Derived Class – Nesting of Classes.

UNIT IV I/O AND POLYMORPHISM 9

Pointer to Objects – This Pointer – Virtual Functions – Polymorphism – C++ Streams – Stream Classes – Unformatted I/O – Formatted Console I/O Operations – Managing Output with Manipulators.

UNIT V FILES AND EXCEPTION HANDLING: 9

Files – Open – Close and Deleting End of File – Modes – Sequential I/O – Updating – Error Handling – Command Line Arguments – Templates – Class and Function Templates – Exception Handling – Standard Exceptions.

Total: 45

TEXT BOOK

1. E. Balagurusamy. "Object Oriented Programming with C++", Tata McGraw Hill. 2005

REFERENCES

1. Ira Pohl, "Object Oriented Programming with C++", Pearson Edition. 2003.
2. Poornachandra Sarang, "Object Oriented Programming with C++", Prentice Hall of India, 2004.
3. S.B. Lippmen. and Josee Lajoie "C++ Primer", Pearson Edition, 2004.

CS4152 – COMPUTER ARCHITECTURE

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UNIT I DATA REPRESENTATION AND DIGITAL LOGIC 9

Data Representation in Computer Systems – Number Systems – Positional Numbering Systems – Decimal to Binary Conversions – Signed Integer Representation – Floating- Point Representation. Boolean Algebra – Digital logic – Logic Gates – Digital Components – Combinational Circuits – Sequential Circuits – Designing Circuits.

UNIT II 9

Fundamentals – Simple Computer – Instruction Processing – Assemblers – Instruction Set – Decoding – Hardwired and Micro Programmed Control – Computer Architecture – Examples.

UNIT III INSTRUCTION SET AND MEMORY SYSTEM 9

Instruction Set Architectures – Instruction Formats – Instruction Types – Addressing – Instruction – Level Pipelining – Memory – Types of Memory – Memory Hierarchy – Cache Memory – Virtual Memory – Memory Management – Examples.

UNIT IV 9

Input/Output and Storage Systems – Amdahl's Law – I/O Architectures – Magnetic Disk Technology – Optical Disks – Magnetic Tape – RAID – Data Compression.

UNIT V 9

Performance Measurement and Analysis – Measuring and Reporting Performance – Quantitative Principles of Computer Design.

Total: 45

TEXT BOOKS

1. Linda Null and Julia Lobur, "The Essentials of Computer Organization", Narosa Publications, 2000.
2. John L.Hennessy and David A.Patterson, "Computer Architecture A qualitative Approach ", Third Edition, Elsevier, 2004.

REFERENCES

1. Morris Mano, "Computer System Architecture", Third Edition, Pearson Education, 2002.
2. Carl Hamacher, Zvonko Veonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, McGraw Hill, 2002.
3. John P.Hayes, "Computer Architecture and Organization", Third Edition, Mc Graw Hill, 2000.

CS4153 – DATA BASE MANAGEMENT SYSTEMS

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UNIT I SYSTEM AND DATA 9

File System vs. DBMS – Views of Data Models – Database Languages – Database Management System Services – Overall System Architecture – Data Dictionary – Entity – Relationship (E– R) – Enhanced Entity – Relationship Model.

UNIT II RELATIONAL APPROACH 9

Relational Model – Relational Data Structure – Relational Data Integrity – Domain Constraints – Entity Integrity – Referential Integrity – Operational Constraints – Keys – Codd's Rules – Relational Algebra – Fundamental Operations – Additional Operational – SQL – Basic Structural – Set operations – Aggregate Functions – Null values – Nested Sub Queries – Derived Relations – Views – Modification of the Database – Joined Relations – Data Definition – Language – Embedded SQL – Dynamic SQL – Triggers.

UNIT III DATABASE DESIGN 9

Functional Dependencies – Pitfalls in Relational Database Design – Decomposition – Normalization using Functional Dependencies – Normalization using Join Dependencies – Domain – Key Normal Form.

UNIT IV IMPLEMENTATION TECHNIQUES 9

Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary storage – File Organization – Organization of Records in Files – Indexing and Hashing – Ordered Indices – B+ tree Index Files – B tree Index Files Hashing – Dynamic Hashing – Query Processing.

UNIT V ADVANCES IN DATABASES 9

Distributed Databases – Data Storage – Network Transparency – Query Processing – Transaction Model – Commit Protocols – Object Oriented Database – Object Oriented Data Model – Object Oriented Languages – Active and Deductive database – Temporal Database – Parallel Database – Basics of Data mining and Data Warehousing.

Total: 45

TEXT BOOK

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concept", Fourth Edition, Tata McGraw Hill, 2002.

REFERENCES

1. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", Fourth Edition, Assision Weskey, Hill, 2002.
2. Raghu Ramakrishnan, "Database Management System", Third Edition, McGraw Hill, 2002.
3. Peter Rob and Corlos coronel, "Database System Design, Implementation and Management", Fifth Edition, Thompson Learning, Course Technology, 2003.

CS4154 – RDBMS AND OOPs LABORATORY

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RDBMS

1. Create simple queries
 - A) DDL
 - B) DML
 - C) TCL
2. Nested Queries using SQL.
3. Queries using join operations.
4. Program using build-in function.
5. Database connectivity using application.
Employee table.
Library Management System.
6. Triggers.

OOPs

7. To implement the class and objects.
8. To implement the string concatenation using dynamic memory allocation.
9. To implement the distance between the two objects using friend function.
10. To implement the Arithmetic operations of complex numbers using constructor overloading.
11. To implement the operator overloading for unary '+' and '-' operators.
12. To implement the single and multiple inheritance and virtual function.

Total: 45

EC4205 – MICROPROCESSORS AND MICROCONTROLLERS

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UNIT I THE 8085 MICROPROCESSOR	3	0	0
Basics of 8085 – Microprocessor Architecture – Instruction Set – Programming the 8085.			9
UNIT II 8086 SOFTWARE ASPECTS			9
Intel 8086 Microprocessor – Architecture – Instruction Set and Assembler Directives – Addressing Modes – Assembly Language Programming – Procedures – Macros – Interrupts And Interrupt Service Routines.			
UNIT III 8086 SYSTEM DESIGN			9
8086 Signals – Basic Configurations – System Bus Timing – System Design Using 8086 – Multiprocessor Configurations – Coprocessor – Closely Coupled and Loosely Coupled Configuration – Introduction To 80286.			
UNIT IV I/O INTERFACING			9
Memory Interfacing And I/O Interfacing – Parallel Communication Interface – Serial Communication Interface – Timer – Keyboard / Display Controller – Interrupt Controller – DMA Controller – Programming and Applications.			
UNIT V MICROCONTROLLERS			9
Architecture of 8051 – Signals – Operational Features – Memory And I/ O Addressing – Interrupts – Instruction Set – Applications.			

Total: 45

TEXT BOOKS

1. Ramesh S.Gaonkar, "Microprocessor Architecture, Programming and Applications with the 8085", Fifth Edition, Penram International Publishing Pvt. Ltd., 2004.
2. Yu Cheng Liu, Glenn A. Gibson, "Microcomputer Systems the 8086/8088 Family Architecture, Programming and Design", Second Edition, Prentice Hall of India, 2003.
3. Mohamed.A, N.Mazidi, Janice Gillispie Mazidi, "The 8051 Microcontroller and Embedded Systems", Pearson Education, 2004.

REFERENCES

1. Barry B. Brey, "The Intel Microprocessors, 8086/8088,80186/80188, 80286,80386, 80486, Pentium, PentiumPro Processor, Pentium II, Pentium III, Pentium IV, Architecture, Programming & Interfacing", Sixth Edition, Pearson Education / Prentice Hall of India, 2002.
2. Douglas.V.Hall,"Microprocessors and Interfacing Programming and Hardware", Third Edition, Tata Mc Graw Hill.
3. A.K. Ray & K. M. Bhurchandi, "Advanced Microprocessors and Peripherals Architectures, Programming and Interfacing", Tata Mc Graw Hill, 2002 Reprint.
4. Peter Abel,"IBM PC Assembly Language and Programming", Fifth Edition, Prentice Hall of India Pvt. Ltd.2001.

CS4201 – OPERATING SYSTEMS

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UNIT I OPERATING SYSTEMS OVERVIEW 9

Basics – Operating System – Mainframe Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real–Time Systems – Handheld Systems – Computer System Structures – Computer – System Operation – I/O Structure – Hardware Protection – Operating System Structures – System Components – System Calls – System Programs – System Structure.

UNIT II PROCESS MANAGEMENT 9

Processes: Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Interprocess Communication – Communication in Client – Server Systems – Threads – Multithreading Models – Threading Issues – Pthreads – CPU Scheduling: Scheduling Criteria – Scheduling Algorithms – Multiple– Processor Scheduling – Real Time Scheduling – Algorithm Evaluation – Process Scheduling Models. Process Synchronization: The Critical– Section Problem – Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Critical Regions – Monitors – Deadlock – System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock.

UNIT III STORAGE MANAGEMENT 9

Memory Management – Background – Swapping – Contiguous Memory Allocation – Paging – Segmentation – Segmentation with Paging – Virtual Memory – Background – Demand Paging – Process Creation – Page Replacement – Allocation of Frames – Thrashing.

UNIT IV I/O SYSTEMS 9

File–System Interface – File Concept – Access Methods – Directory – Structure – File – System Mounting – Protection – File – System Implementation – Directory Implementation – Allocation Methods – Free – Space Management – Mass – Storage Structure – Disk Scheduling – Disk Management – Swap – Space Management.

UNIT V CASE STUDY 9

The Linux System – History – Design Principles – Kernel Modules – Process Management – Scheduling – Memory Management – File Systems – Input and Output – Inter Process Communication – Network Structure – Security – Windows 2000 – History – Design Principles – System Components – Environmental Subsystems – File System – Networking.

Total: 45

TEXT BOOK

1. Silberschatz, Galvin and Gagne, "Operating System Concepts", Sixth Edition, John Wiley & Sons Inc, 2002.

REFERENCES

1. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Addison Wesley, 2001.
2. Gary Nutt, "Operating Systems", Second Edition, Addison Wesley, 2001.
3. Harvey M. Deital, "Operating Systems", Second Edition, Addison Wesley, 2000.

CS4202 – SYSTEM SOFTWARE

L T P
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UNIT I BASIC CONCEPTS 9

Background – Basics – System Software and Machine Architecture – The Simplified Instructional Computer (SIC) – Machine Architectures (SIC and SIC/XE) – Data and Instruction Formats – Addressing Modes – Instruction Sets – I/O Programming.

UNIT II ASSEMBLERS 9

Basic Assembler Functions – A Simple SIC Assembler – Assembler Algorithms and Data Structures – Machine Dependent Assembler Features – Instruction Formats and Addressing Modes – Program Relocation – Machine Independent Assembler Features – Literals – Symbol – Defining Statements – Expressions – Program Blocks – Control Sections and Program Linking – One Pass Assembler and Multipass Assemblers – Implementation Examples – MASM Assembler.

UNIT III LOADERS AND LINKERS 9

Basic Loader Functions – Design of an Absolute Loader – A Simple Bootstrap Loader – Machine Dependent Loader Features – Relocation – Program Linking – Algorithm and Data Structures for Linking Loader – Machine – Independent Loader Features – Automatic Library Search – Loader Options – Loader Design Options – Linkage Editors – Dynamic Linking – Bootstrap Loaders – Implementation Examples – MSDOS Linker.

UNIT IV MACROPROCESSORS 9

Basic Macro Processor Functions: Macro Definition And Expansion – Macro Processor Algorithm And Data Structures – Machine– Independent Macro Processor Features: Concatenation of Macro Parameters – Generation of Unique labels – Conditional Macro Expansion – Keyword Macro Parameters – Macro Processor Design Options – Recursive Macro Expansion – Algorithm – General Purpose Macro Processors – Macro Processing within Language Translators – Implementation Examples – MASM Macro Processor – ANSI C Macro Language.

UNIT V OTHER SYSTEM SOFTWARE 9

Text Editors – Overview of Editing Process – User Interface – Editor Structure – Interactive Debugging Systems – Debugging Functions and Capabilities – Relationships with Other Parts of the System – User Interface Criteria.

Total: 45

TEXT BOOK

1. Leland Beck, "System Software An Introduction to Systems Programming", Third Edition, Pearson Education Inc, 2002.

REFERENCES

1. D. M. Dhamdhare, "Systems Programming and Operating Systems", Tata McGraw Hill Company, 1999.
2. John J. Donovan, "Systems Programming", Second Edition, Tata McGraw Hill, 1972.

CS4203 – SYSTEM PROGRAMMING LABORATORY

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1. Assemblers.
2. Linkers.
3. Loaders.
4. Features of Text editors.
5. Basic UNIX commands.
6. Shell Programming.
7. Grep, sed, awk.
8. File system related system calls.
 - i. Process management– Fork, Exec.
 - ii. Message queues.
 - iii. Pipe, FIFO's.
 - iv. Signals.
 - v. Shared memory.

Total: 45

CS4251 – OBJECT ORIENTED ANALYSIS AND DESIGN

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UNIT I BASICS 9

An Overview of Object Oriented Systems Development – Object Basics – Object Oriented Systems Development Life Cycle.

UNIT II OBJECT– ORIENTED METHODOLOGIES 9

Rumbaugh Methodology – Booch Methodology – Jacobson Methodology – Patterns – Frameworks – Unified Approach – Unified Modeling Language – Use Case – Class Diagram – Interactive Diagram – Package Diagram – Collaboration Diagram – State Diagram – Activity Diagram.

UNIT III OBJECT– ORIENTED ANALYSIS 9

Identifying Use Cases – Object Analysis – Classification – Identifying Object Relationships – Attributes and Methods.

UNIT IV OBJECT– ORIENTED DESIGN 9

Design axioms – Designing Classes – Access Layer – Object Storage – Object Interoperability.

UNIT V SOFTWARE QUALITY AND REUSABILITY 9

Designing Interface Objects – Software Quality Assurance – System Usability – Measuring User Satisfaction.

Total: 45

TEXT BOOKS

1. Ali Bahrami, "Object Oriented Systems Development", Tata McGraw Hill, 1999.
2. Martin Fowler, "UML Distilled", Second Edition, Prentice Hall of India, Pearson Education, 2002.

REFERENCES

1. Stephen R. Schach, "Introduction to Object Oriented Analysis and Design", Tata McGraw Hill, 2003.
2. James Rumbaugh, Ivar Jacobson, Grady Booch "The Unified Modeling Language Reference Manual", Addison Wesley, 1999.
3. Hans Erik Eriksson, Magnus Penker, Brain Lyons, David Fado, "UML Toolkit", OMG Press Wiley Publishing Inc., 2004.

CS4252 – SOFTWARE ENGINEERING

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UNIT I SOFTWARE PRODUCT AND PROCESS 9

Basics – Software Engineering Paradigm – Verification – Validation – Life Cycle Models – System Engineering – Computer Based System – Business Process Engineering Overview – Product Engineering Overview.

UNIT II SOFTWARE REQUIREMENTS 9

Functional and Non- Functional – Software Document – Requirement Engineering Process – Feasibility Studies – Software Prototyping – Prototyping in the Software Process – Data – Functional and Behavioral Models – Structured Analysis and Data Dictionary.

UNIT III ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES 9

Systems Engineering – Analysis Concepts – OO Concepts – OOA Design Process and Concepts – Modular Design – Design Heuristic – Architectural Design – Data Design – User Interface Design – Real Time Software Design – System Design – Real Time Executives – Data Acquisition System – Monitoring and Control System.

UNIT IV TESTING 9

Taxonomy of Software Testing – Types of Software Test – Black Box Testing – Testing Boundary Conditions – Structural Testing – Test Coverage Criteria Based on Data Flow Mechanisms – Regression Testing – Unit Testing – Integration Testing – Validation Testing – System Testing and Debugging – Software Implementation Techniques.

UNIT V SOFTWARE PROJECT MANAGEMENT 9

Measures And Measurements – ZIPF's Law – Software Cost Estimation – Function Point Models – COCOMO Model – Delphi Method – Scheduling – Earned Value Analysis – Error Tracking – Software Configuration Management – Program Evolution Dynamics – Software Maintenance – Project Planning – Project Scheduling – Risk Management – CASE Tool.

Total: 45

TEXT BOOKS

1. Roger S. Pressman, "Software Engineering A Practitioner's Approach", Fifth Edition, McGraw Hill International Edition, 2001.
2. Ian Sommerville, "Software engineering", Sixth Edition, Pearson Education Asia, 2000.

REFERENCES

1. Pankaj Jalote, "An Integrated Approach to Software Engineering", Second Edition, Springer Verlag, 1997.
2. Ali Behforooz and Frederick J. Hudson, "Software Engineering Fundamentals", Oxford University Press, New Delhi, 1996.
3. Stephan R. Schach, "Software Engineering with JAVA", Tata McGraw Hill, 1998.
4. Shari Lawrence Pfleeger, "Software Engineering Theory and Practice", Second Edition, Pearson Education Asia, 2001.
5. Kathy Schwalbe, "Information Technology Project Management", Course Technology Inc, 2003.
6. William E. Perry, "Effective Methods for Software Testing", Second Edition, John Wiley & sons Inc., 2001.
7. Edward Kit, "Software Testing in the Real World", Addition Wesley, 2000.

CS4253 – DATA COMMUNICATION AND COMPUTER NETWORKS

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UNIT I COMMUNICATION FUNDAMENTALS 9

Data Transmission – Transmission Media – Data Encoding – Data Communication Interface – Multiplexing.

UNIT II DATA LINK LAYER 9

Network Architecture – Layering – OSI Architecture – Framing – Error Detection – Reliable Transmission – IEEE Standards – Ethernet – Token Ring – FDDI – Token Bus – Wireless LAN – Bridges.

UNIT III NETWORK LAYER 9

Circuit switching – Packet Switching – Internetworking – Address Resolution Protocol – Reverse Address Resolution Protocol – Dynamic Host Configuration Protocol – Internet Control Message Protocol – Routing – Routing algorithms – Addressing – Subnetting – CIDR – Inter domain routing – IPv6 – Quality of Service.

UNIT IV TRANSPORT LAYER 9

Transport Layer – User Datagram Protocol (UDP) – Transmission Control Protocol – Congestion Control – Flow Control – Queuing Disciplines – Congestion Avoidance Mechanisms.

UNIT V APPLICATIONS 9

Domain Name System (DNS) – E- mail – World Wide Web (HTTP) – Simple Network Management Protocol – File Transfer Protocol (FTP) – Security – Multimedia Applications.

Total: 45

TEXT BOOKS

1. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000.
2. Larry L. Peterson, Bruce S. Davie, "Computer Networks A Systems Approach", Third Edition, Morgan Kauffmann Publishers Inc., 2003.
3. James F. Kuross, Keith W. Ross, "Computer Networking A Top Down Approach Featuring the Internet", Third Edition, Addison Wesley, 2004.

REFERENCES

1. Andrew .S. Tanenbaum, "Computer Networks", Fourth Edition, 2003.
2. Comer, "Computer Networks and Internets with Internet Applications", Fourth Edition, Pearson Education, 2003.

ES4254 – COMPUTER NETWORKS LABORATORY

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1. Socket Programming
 - TCP Sockets
 - UDP Sockets
2. Applications using sockets.
3. Simulation of ARP/RARP.
4. Simulation of Sliding Window Protocol.
5. Simulation of routing protocols.
6. RPC.
7. DNS/HTTP.

V SEMESTER
CS4301 – PRINCIPLES OF COMPILER DESIGN

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UNIT I SOURCE PROGRAM ANALYSIS 9

Compilers – Analysis of the Source Program – Phases of a Compiler – Grouping of Phases – Compiler Construction Tools – Lexical Analysis: Role of Lexical Analyzer – Input Buffering – Specification of Tokens – Recognition of Tokens – A Language for Specifying Lexical Analyzer – Role of Parser – Context free grammars – Writing a Grammar – Predictive Parser – LR Parser.

UNIT II INTERMEDIATE CODE GENERATION 9

Intermediate Languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back Patching – Procedure Calls.

UNIT III BASIC OPTIMIZATION 9

Constant – Expression Evaluation – Scalar Replacement of Aggregates – Algebraic Simplifications and Re-association – Value Numbering – Copy Propagation – Common Sub-Expression Elimination – Loop– Invariant Code Motion – Partial Redundancy Elimination – Redundancy Elimination and Re-association – Code Hoisting – Induction Variable Optimization – Unnecessary Bounds– Checking Elimination.

UNIT IV PROCEDURAL AND LOW– LEVEL OPTIMIZATION 9

Tail-Call Optimization and Tail– Recursion Elimination – Procedure Integration – Inline Expansion – Leaf Routine Optimization and Shrink Wrapping – Register Allocation and Assignment – Graph Coloring – Unreachable Code Elimination– Straightening – If Simplifications – Loop Simplifications – Loop Inversion – Un-switching – Branch Optimizations – Tail Merging or Cross Jumping – Conditional Moves – Dead Code Elimination – Branch Prediction – Machine Idioms and Instruction Combining.

UNIT V CODE GENERATION 9

Issues in the Design of Code Generator – The Target Machine – Runtime Storage Management – Next use Information – A Simple Code Generator – DAG Representation of Basic Blocks – Peephole Optimization – Generating Code from DAGs.

Total: 45

TEXT BOOKS

1. Alfred Aho V, Ravi Sethi, D. Jeffery Ullman, "Compilers Principles, Techniques and Tools", Addison Wesley, 1988.
2. Steven S, Muchnick, "Advanced Compiler Design Implementation", Morgan Koffman, 1997.

REFERENCES

1. Allen Holub, "Compiler Design in C", Prentice Hall of India, 1990.
2. Charles N. Fischer, Richard J. Leblanc, "Crafting a Compiler with C", Benjamin Cummings, 1991.

CS4302 – GRAPHICS AND MULTIMEDIA

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UNIT I 2D GRAPHICS 9

Line, Curve and Ellipse Algorithms – Attributes – 2D Transformation – Viewing.

UNIT II 3D GRAPHICS 9

3D Concepts – Object Representation – Transformation – Viewing – Color Models – Animation.

UNIT III MULTIMEDIA SYSTEMS 9

Multimedia Systems Design – Basics – Multimedia applications – Multimedia System Architecture – Evolving Technologies for Multimedia – Defining Objects for Multimedia Systems – Multimedia Data Interface Standards – Multimedia Databases.

UNIT IV MULTIMEDIA TECHNOLOGIES 9

Compression & Decompression – Data & File Format standards – Multimedia I/O Technologies – Digital Voice and Audio – Video Image and Animation – Full Motion Video – Storage and Retrieval Technologies.

UNIT V MULTIMEDIA AND HYPERMEDIA 9

Multimedia Authoring and User Interface – Hypermedia Messaging Mobile Messaging – Hypermedia Message Component – Creating Hypermedia Message – Integrated Multimedia Message Standards – Integrated Document Management – Distributed Multimedia Systems.

Total: 45

TEXT BOOKS

1. Donald Hearn & Pauline Baker, “Computer Graphics”, Second Edition, 1996.
2. Prabath K. Andleigh & Kiran Thakrar, “Multimedia Systems & Design”, First Edition Prentice Hall of India, 1995.

REFERENCES

1. Judith Jeffcoate, “Multimedia in Practice Technology and Applications”, First Edition, Prentice Hall of India, 1995.
2. Foley, Vandam, Feiner, Huges, “Computer Graphics: Principles and Practice”, Second Edition, Pearson Education, 2003.
3. Cooley, “Essence of Computer Graphics”, First Edition, Pearson Education, 2004.

CS4303 – WEB TECHNOLOGY

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UNIT I BASIC CONCEPTS 9

Internet Principles – Basic Web Concepts – Client/Server Model – Retrieving Data from Internet – Scripting Languages – Perl Programming – Next Generation Internet – Protocols and Applications.

UNIT II COMMON GATEWAY INTERFACE PROGRAMMING 9

HTML Forms – CGI Concepts – HTML Tags Emulation – Server – Browser Communication – E– mail Generation – CGI Client Side Applets – CGI Server Side Applets – Authorization and Security – CGI Programs using Perl.

UNIT III XML 9

Creating Markup with XML – Document Type Definition – Schemas – Document Object Model – Simple API for XML – Extensible Stylesheet Languages – Formatting Objects – Xpath-Xlink and XPointer – Basics of SOAP – Case Studies – Custom Markup Languages.

UNIT IV SERVER SIDE PROGRAMMING 9

Dynamic Web Content – Server Side Includes – Communication – Active and Java Server Pages – Firewalls – Proxy Servers – Web Service Implementation.

UNIT V ONLINE APPLICATIONS 9

Simple Applications – On-line Database – Monitoring User Events – Plug– ins – Database Connectivity – Internet Information Systems – EDI Application in Business – Internet Commerce – Customization of Internet Commerce.

Total: 45

TEXT BOOK

1. Deitel and Deitel, Nieto, Sadhu, "Xml How to Program", Pearson Education Publishers, 2001.
2. Ericc Ladd, Jim O' Donnel, "Using HTML 4, XML and Java", PHI, QUE, 1999.

REFERENCES

1. Jeffy Dwight, Michael Erwin and Robert Niles, "Using CGI", PHI, QUE, 1999.
2. Scot Johnson, Keith Ballinger, Davis Chapman, "Using Active Server Pages", PHI, 1999.

CS4304 – DATA WAREHOUSING AND DATA MINING

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UNIT I OVERVIEW 9

Definition of Data Mining – Data Mining Vs Query Tools – Machine Learning – Taxonomy of Data Mining Tasks – Steps in Data Mining Process – Overview of Data Mining Techniques.

UNIT II DATA WAREHOUSING 9

Definition – Multidimensional Data Model – Data Cube – Dimension Modeling – OLAP Operations – Warehouse Schema – Data Warehouse Architecture – Data Mart – Meta Data – Types of Meta Data – Data Warehouse Backend Process – Development Life Cycle.

UNIT III DATA PRE PROCESSING AND CHARACTERIZATION 9

Data Cleaning – Data Integration and Transformation – Data Reduction – Discretization and Concept Hierarchy Generation – Primitives – Data Mining Query Language – Generalization – Summarization – Analytical Characterization and Comparison – Association Rule – Mining Multi-Dimensional data from Transactional Databases and Relational Databases.

UNIT IV CLASSIFICATION 9

Classification – Decision Tree Induction – Bayesian Classification – Prediction – Back Propagation – Cluster Analysis – Hierarchical Method – Density Based Method – Grid Based Method – Outlier Analysis.

UNIT V APPLICATIONS 9

Tools – Applications – Case Study.

Total: 45

TEXT BOOKS

1. Paulraj Ponnaiah, “Data Warehousing Fundamentals”, Wiley Publishers, 2001.
2. Jiawei Han, Micheline Kamber, “Data Mining: Concepts and Techniques”, Morgan Kaufman Publishers, 2000

REFERENCES

1. Usama M. Fayyad, Gregory Piatetsky Shapiro, Padhraí Smyth, Ramasamy Uthurusamy, “Advances in Knowledge Discover and Data Mining “, The MIT Press, 1996.
2. Ralph Kimball, Margy Ross, “The Data Warehouse Toolkit”, John Wiley and Sons Inc., 2002.
3. Alex Berson, Stephen Smith, Kurt Thearling, “Building Data Mining Applications for CRM”, Tata McGraw Hill, 2000.
4. Margaret Dunham, “Data Mining Introductory and Advanced Topics”, PHI, 2002.

CS4305 – WEB TECHNOLOGY LABORATORY

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LIST OF EXPERIMENTS

1. Designing Web Pages Using Client Side Scripting and DHTML.
2. Client Server Scripting Programs.
3. Simulation of Email and File Transfer Protocols.
4. Development of Web Services.
5. XML and Databases.
6. Server Side Application Using JSP.
7. Web Customization.
8. Development of E– business Application.

Total: 45

CS4351 – MOBILE COMPUTING

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UNIT I WIRELESS COMMUNICATION FUNDAMENTALS 9

Basics – Wireless Transmission – Frequencies for Radio Transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread Spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

UNIT II TELECOMMUNICATION SYSTEMS 11

GSM – System Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Handover – Security – GPRS

UNIT III WIRELESS NETWORKS 9

Wireless LAN – IEEE 802.11 Standards – Architecture – Services – HIPERLAN – AdHoc Network – Blue Tooth.

UNIT IV NETWORK LAYER 9

Mobile IP – Dynamic Host Configuration Protocol – Routing – DSDV – DSR – AODV – ZRP – ODMR.

UNIT V TRANSPORT AND APPLICATION LAYERS 7

TCP over Wireless Networks – Indirect TCP – Snooping TCP – Mobile TCP – Fast Retransmit / Fast Recovery – Transmission/Timeout Freezing – Selective Retransmission – Transaction Oriented TCP – WAP – WAP Architecture – WDP – WTLS – WTP – WSP – WML – WML Script – WAE – WTA.

Total: 45

TEXT BOOKS

1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education, 2003.
3. William Stallings, "Wireless Communications and Networks", Second Edition, Prentice Hall of India / Pearson Education, 2004.

REFERENCES

1. Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", Pearson Education, 2003.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, Newyork, 2003.
3. C.K.Toh, "Adhoc Mobile Wireless Networks", Pearson Education, 2002.

CS4352 – SECURITY IN COMPUTING

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UNIT I BASIC CONCEPTS 10

Security Problem in Computing – Elementary Cryptography – DES – AES – Public Key Encryption – Uses of Encryption.

UNIT II PROGRAM SECURITY 8

Security Programs – Non-malicious Program Errors – Virus and other Malicious Code – Targeted Malicious Code – Control against program Threats.

UNIT III SECURITY IN OPERATING SYSTEMS 9

Protected Objects and Methods of Protection – Memory and Address Protection – Control of Access generated Objects – File Protection Mechanisms – User Authentication – Trusted Operating Systems Design – Assurance in Trusted Operating Systems.

UNIT IV DATABASE AND NETWORK SECURITY 11

Database Security Requirements – Reliability and Integrity – Sensitive Data– Inference – Multilevel Databases and Multilevel Security – Threats in Networks – Network Security Controls – firewalls – Intrusion Detection Systems – Secure E-Mail.

UNIT V ADMINISTERING SECURITY AND ETHICAL ISSUES 7

Security Planning – Risk Analysis – Organizational Security Policies – Physical Security – Protecting Programs and Data – Information and the Law – Software Failures – Computer Crime– Privacy – Ethical issues.

Total: 45

TEXT BOOKS

1. Charles B. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Third Edition, Pearson Education, 2003.

REFERENCES

1. Matt Bishop, “Computer Security Art and Science”, First Edition, Pearson Education, 2003.
2. William Stallings, “Cryptography and Network Security Principles and Practices”, Third Edition, Prentice hall of India, 2003.
3. Atul Kahate,” Cryptography and Network Security”, Tata McGraw Hill, 2003.

CS4353 – SOFTWARE DEVELOPMENT LABORATORY

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Take up a Software Development project of your choice and systematically carry out all the phases of SDLC. Do the necessary documentation at each stage. Use appropriate CASE tools.

The project to be carried out may be in domain such as

1. Hospital Information System.
2. Campus Placement System in ANNA UNIVERSITY.
3. Entrance Exam Registration System.
4. Simulator Software for Parallel Processing Operation.
5. Inventory System.
6. Library management System.
7. Text Editor.
8. Create a Dictionary.
9. Telephone Dictionary.
10. Create an E-Book of your choice.

Total: 45

SEMESTER VII

CS4451 – ARTIFICIAL INTELLIGENCE

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UNIT I BASIC CONCEPTS 8

Intelligent Agents – Agents and Environments – Good Behavior – The Nature of Environments – Structure of Agents – Problem Solving – Problem Solving Agents – Example Problems – Searching for Solutions – Uniformed Search Strategies – Avoiding Repeated States – Searching with Partial Information.

UNIT II SEARCHING TECHNIQUES 10

Informed Search Strategies – Heuristic Function – Local Search in Continuous Spaces – Online Search Agents and Unknown Environments – Constraint Satisfaction Problems (CSP) – Backtracking Search and Local Search – Structure of Problems – Adversarial Search – Games – Optimal Decisions in Games – Alpha – Beta Pruning – Imperfect Real– Time Decision – Games that include an element of Chance.

UNIT III KNOWLEDGE REPRESENTATION 10

First Order Logic – Syntax and Semantics – Using First Order Logic – Knowledge Engineering – Inference – Propositional Versus First Order Logic – Unification and Lifting – Forward Chaining – Backward Chaining – Resolution – Knowledge Representation – Ontological Engineering – Categories and Objects – Actions – Simulation and Events – Mental Events and Mental Objects.

UNIT IV LEARNING 9

Learning from Observations – Forms of Learning – Inductive Learning – Learning Decision Trees – Ensemble Learning – Knowledge in Learning – Logical Formulation of Learning – Explanation Based Learning – Learning Using Relevant Information – Inductive Logic Programming – Statistical Learning Methods – Learning with Complete Data – Learning with Hidden Variable – EM Algorithm – Passive Reinforcement Learning – Active Reinforcement Learning – Generalization in Reinforcement Learning.

UNIT V APPLICATIONS 8

Communication – Communication as Action – Formal Grammar for a Fragment of English – Syntactic Analysis – Augmented Grammars – Semantic Interpretation – Ambiguity and Disambiguation – Discourse Understanding – Grammar Induction – Probabilistic Language Processing – Probabilistic Language Models – Information Retrieval – Information Extraction – Machine Translation.

Total: 45

TEXT BOOK

1. Stuart Russell, Peter Norvig, "Artificial Intelligence A Modern Approach", Second Edition, Pearson Education, 2004.

REFERENCES

1. Nils J. Nilsson, "Artificial Intelligence A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", Second Edition, Tata McGraw Hill, 2003.
3. Gerge F. Luger, "Artificial Intelligence Structures and Strategies for Complex Problem Solving", Pearson Education, 2002.

CS4452 – PRINCIPLES OF PROGRAMMING LANGUAGES

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UNIT I BASIC CONCEPTS 9

Reasons for Studying the Concepts of Programming Languages – Language Evaluation Criteria – Language Categories – Implementation Methods – Evaluation of Programming Languages.

UNIT II DATA 9

Syntax – Semantics – Names – Data Types – Primitive – Composite – Binding – Typing – Scope – Static – Dynamic – Abstract Data Types.

UNIT III CONTROL 9

Expressions – Assignment – Selective – Iterative.

UNIT IV SUBPROGRAMS 9

Fundamentals – Parameter Passing Methods – Semantics of Calls and Returns – Implementation Issues – Exception Handling.

UNIT V PROGRAMMING PARADIGMS 9

Logic – Concurrent – Functional – Object-Oriented.

Total: 45

TEXT BOOK

1. Robert W. Sebesta, "Concepts of Programming Languages", Sixth Edition, Addison Wesley, 2003.

REFERENCES

1. Carlo Ghezzi, Politec Nico Di Milano, Mehdi Jazayeri, "Programming Language Concepts", Technical University Wien, John Wiley and Sons, 1998.
2. Ravi Sethi, "Programming Languages Concepts and Constructs", Second Edition, Addison Wesley Publishing Company, Feb First, 1996.
3. T.W. Pratt and M.V. Zelkowitz, "Programming Languages Design and Implementation", Third Edition, PHI, 1999.

CS4453 – SCIENTIFIC COMPUTING TECHNIQUES

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UNIT I **ROOTS OF EQUATION AND LINEAR ALGEBRAIC EQUATION** **9**

Graphical Method – Iterative Methods – Simple One– Point Iteration – Newton– Raphson Method – Break– Even Analysis – Ideal and Nonideal gas Laws – Gauss Elimination – Solution of Linear Systems by Gaussian, Gauss– Jorda, Jacobi and Gauss– Seidel Method – Matrix Inversion – Gauss-Jordan Method – Gauss-Seidel Method.

UNIT II **INTERPOLATION** **10**

Least-Square Regression – Newton’s and Divided – Difference Interpolating Polynomials – Lagrange’s and hermite’s Polynomials – Newton’s Forward and Backward Difference Formula – Stirling’s and Bessel’s Central Difference Formulae.

UNIT III **NUMERICAL DIFFERENTIATION AND INTEGRATION** **10**

Numerical Differentiation with Interpolation Polynomials – Numerical Integration by Trapezoidal and Simpson’s Rules – Two and Three point Gaussian Quadrature Formulae – Double Integral using Trapezoidal and Simpson’s Rule.

UNIT IV **SYSTEM MODELING** **8**

Modeling and General Systems Theory – Concept of Simulation – Types of Simulation – Design of Simulation Experiments – Logic Flow Chart – Experimental Design Consideration.

UNIT V **SIMULATION LANGUAGES AND CASE STUDIES** **8**

Comparison and Selection of Simulation Languages – Development of Simulation Models using any one of the Languages for some Problems.

Total: 45

TEXT BOOKS

1. Steven C. Chapra, Raymond P. Canale,” Numerical Methods for Engineering”, Second Edition, McGraw Hill, 1989.
2. Geoffery Gordon,”System Simulation”, Second Edition, PHI, 2002.

REFERENCES

1. Jerry Banks and John Carson, ”Discrete Event System Simulation”, Third Edition, PHI, 2002.
2. Sastry S.S,”Introductory Methods of Numerical Analysis”, Third Edition, Prentice Hall India, 1998.

LIST OF ELECTIVES

CS4001 – KNOWLEDGE MANAGEMENT

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UNIT I BASIC CONCEPTS 9

The Value of Knowledge – Knowledge Engineering Basics – Knowledge Economy – The Task and Organizational Content – Knowledge Management – Knowledge Management Ontology.

UNIT II KNOWLEDGE MODELS 9

Knowledge Model Components – Template Knowledge Models – Reflective Knowledge Models – Knowledge Model Construction – Types of Knowledge Models.

UNIT III TECHNIQUES OF KNOWLEDGE MANAGEMENT 8

Knowledge Elicitation Techniques – Modeling Communication Aspects – Knowledge Management and Organizational Learning.

UNIT IV KNOWLEDGE SYSTEM IMPLEMENTATION 11

Case studies – Designing Knowledge Systems – Knowledge Codification – Testing and Deployment – Knowledge Transfer and Knowledge Sharing – Knowledge system implementation.

UNIT V ADVANCED KM 8

Advanced Knowledge Modeling – Value Networks – Business Models for Knowledge Economy – UML Nations – Project Management.

Total: 45

TEXT BOOKS

1. Guus Schreiber, Hans Akkermans, Anjo Anjewierden, Robert de Hoog, Nigel Shadbolt, Walter Van de Velde and Bob Wielinga, "Knowledge Engineering and Management", Universities Press, 1999.
2. Elias M.Award & Hassan M. Ghaziri, "Knowledge Management", Prentice Hall Pearson Education, 2003.

REFERENCES

1. C.W.Holsapple, "Handbooks on Knowledge Management", International Handbooks on Information Systems, Springer Verlag 2004.
2. <http://www.epistemics.co.uk>.
3. http://depts.washington.edu/pettt/papers/WIN_poster_text.pdf.

CS4002 – UNIX INTERNALS

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UNIT I OVERVIEW 8

General Overview of the System – History – System Structure – User Perspective – Operating System Services – Assumptions about Hardware – Introduction to the Kernel – Architecture of the UNIX operating system – Introduction to System Concepts – The Buffer Cache – Buffer Headers – Structure of the Buffer Pool – Scenarios for Retrieval of a Buffer – Reading and Writing Disk Blocks – Advantages and Disadvantages of the Buffer Cache.

UNIT II FILE SUBSYSTEM 8

Internal Representation of Files – Inodes – Structure of a Regular File – Directories – Conversion of a Path Name to an inode – Super Block – inode Assignment to a New File – Allocation of Disk Blocks.

UNIT III SYSTEM CALLS FOR THE FILE SYSTEM 10

Open – Read – Write – File and Record Locking – Adjusting the Position of File I/O – Lseek – Close – File Creation – Creation of Special Files – Changing Directory –Root –Owner – Mode – Stat and Fstat – Pipes – Dup – Mounting and Unmounting File Systems – Link – Unlink.

UNIT IV PROCESSES 10

Process States and Transitions – Layout of System Memory – The Context of a Process – Saving the Context of a Process – Manipulation of the Process Address Space – Sleep – Process Control – Process Creation – Signals – Process Termination – Awaiting Process Termination – Invoking Other Programs – User id of a Process – Changing the Size of a Process – Shell – System Boot and the INIT Process Scheduling.

UNIT V MEMORY MANAGEMENT AND I/O 9

Memory Management Policies – Swapping – Demand Paging – The I/O Subsystem – Driver Interface – Disk Drivers – Terminal Drivers – Streams – Inter Process Communication.

Total: 45

TEXT BOOK

1. Maurice J.Bach, "The Design of the Unix Operating System", First Edition, Pearson Education, 1999.

REFERENCES

1. B. Goodheart, J. Cox, "The Magic Garden Explained", Prentice Hall of India, 1986.
2. S. J. Leffler, M.K.Mckusick, M.J.Karels and J. S. Quarterman, "The Design and Implementation of the 4.3 BSD Unix Operating System", Addison Wesley, 1998.

CS4003 – SOFT COMPUTING

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UNIT I SOFT COMPUTING AND NEURAL NETWORKS 9

Evolution of Computing – Soft Computing Constituents – From Conventional AI to Computational Intelligence – Adaptive Networks – Feed Forward Networks – Supervised Learning Neural Networks – Radial Basis Function Networks - Reinforcement Learning Neural Networks – Adaptive Resonance Architectures.

UNIT II FUZZY SETS AND FUZZY LOGIC 9

Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Logic – Fuzzy Expert Systems – Fuzzy Decision Making.

UNIT III NEURO-FUZZY MODELING 9

Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Inference Systems – Classification and Regression Trees – Data Clustering Algorithms – Rule Base Structure Identification – Neuro-Fuzzy Control.

UNIT IV MACHINE LEARNING 9

Machine Learning Techniques – Machine Learning Using Neural Nets – Genetic Algorithms (GA) – Applications of GA in Machine learning – Machine Learning Approach to Knowledge Acquisition.

UNIT V SUPPORT VECTOR MACHINES 9

Support Vector Machines for Learning – Linear Learning Machines – Support Vector Classification – Support Vector Regression – Applications.

Total: 45

TEXT BOOKS

1. Jyh-Shing Roger Jang, Chuen Tsai Sun ,Eliji Mizutani, "Neuro-Fuzzy and Soft Computing", Prentice Hall of India, 2003.
2. James A.Freeman and David M. Skapura,"Neural Networks Algorithms, Applications, and Programming Techniques", Pearson Edition., 2003.

REFERENCES

1. George J.Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic Theory and Applications", Prentice Hall, 1995.
2. Amit Konar,"Artificial Intelligence and Soft Computing“, First Edition, CRC Press, 2000.
3. Simon Haykin,"Neural Networks a Comprehensive Foundation", Second Edition, Prentice Hall, 1999.
4. Mitchell Melanie, "An Introduction to Genetic Algorithm", Prentice Hall, 1998.
5. David E. Goldberg," Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, 1997.

CS4005 – REAL TIME SYSTEMS

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UNIT I BASIC CONCEPTS 9

Real Time Systems – Issues in Real Time Computing – Structure of a Real Time System. Task Classes – Performance Measures for Real Time Systems – Estimating Program Run times – Task Assignment and Scheduling – Classical Uniprocessor Scheduling Algorithms – UniProcessor Scheduling of IRIS Tasks – Task Assignment – Mode Changes and Fault Tolerant Scheduling.

UNIT II PROGRAMMING LANGUAGES AND TOOLS 9

Programming Language and Tools – Desired Language characteristics – Data Typing – Control Structures – Facilitating Hierarchical Decomposition – Packages – Run-time (Exception) Error handling – Overloading and Generics – Multitasking – Low Level Programming – Task scheduling – Timing Specifications – Programming Environments – Run-time Support.

UNIT III REAL TIME DATABASES 9

Real time Databases – Basic Definition – Real time Vs General Purpose Databases – Main Memory Databases – Transaction priorities – Transaction Aborts – Concurrency Control Issues – Disk Scheduling Algorithms – Two-phase Approach to improve Predictability – Maintaining Serilization Consistency – Databases for Hard Real Time systems.

UNIT IV COMMUNICATION 9

Real-Time Communication – Communication Media – network Topologies Protocols – Fault Tolerant Routing – Fault Tolerance Techniques – Fault Types – Fault Detection – Fault Error Containment Redundancy – Data Diversity – Reversal Checks – Integrated Failure handling.

UNIT V EVALUATION TECHNIQUES 9

Reliability Evaluation Techniques – Obtaining Parameter Values – Reliability Models for Hardware Redundancy – Software Error models – Clock Synchronization – Clock – A Nonfault – Tolerant Synchronization Algorithm – Impact of Faults – Fault Tolerant Synchronization in Hardware – Fault Tolerant Synchronization in Software.

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CS4006 – ADVANCED DATABASE TECHNOLOGY

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UNIT I DISTRIBUTED DATABASES 9

Distributed Databases Vs Conventional Databases – Architecture – Fragmentation – Query Processing – Transaction Processing – Concurrency Control – Recovery.

UNIT II OBJECT ORIENTED DATABASES 9

Object Oriented Databases – Approaches – Modeling and Design – Persistence – Query Languages – Transaction – Concurrency – Multi Version Locks – Recovery.

UNIT III EMERGING SYSTEMS 9

Enhanced Data Models – Client/Server Model – Data Warehousing and Data Mining – Web Databases – Mobile Databases.

UNIT IV DATABASE DESIGN ISSUES 9

ER Model – Normalization – Security – Integrity – Consistency – Data-Base Tuning – Optimization and Research Issues – Design of Temporal Databases – Spatial Databases.

UNIT V CURRENT ISSUES 9

Rules – Knowledge Bases – Active and Deductive Databases – Parallel Databases – Multimedia Databases – Image Databases – Text Databases.

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CS4007 – TCP/IP DESIGN AND IMPLEMENTATION

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UNIT I INTRODUCTION 9

Internetworking Concepts and Architectural Model – Classful Internet Address – CIDR – Subnetting and Supernetting – ARP – RARP – IP – IP Routing – ICMP – Ipv6.

UNIT II TCP 9

Services – Header – Connection Establishment and Termination – Interactive Data Flow – Timeout and Retransmission – Persist Timer – Keep Alive Timer – Futures and Performance.

UNIT III IP IMPLEMENTATION 9

IP Global Software Organization – Routing Table – Routing Algorithms – Fragmentation and Reassembly – Error Processing (ICMP) – Multicast Processing (IGMP).

UNIT IV TCP IMPLEMENTATION I 9

Data Structure and Input Processing – Transmission Control Blocks – Segment Format – Comparison – Finite State Machine Implementation – Output Processing – Mutual Exclusion – Computing The TCP Data Length.

UNIT V TCP IMPLEMENTATION II 9

Timers – Events and Messages – Timer Process – Deleting and Inserting Timer Event – Flow Control and Adaptive Retransmission – Congestion Avoidance and Control – Urgent Data Processing and Push Function.

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CS4008 – C# AND .NET TECHNOLOGY

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UNIT I	BASIC FEATURES OF C#	9
C# and the .NET Framework – Getting Started – C# Language Fundamentals – Classes and Objects – Inheritance and Polymorphism – Operator Overloading – Structs.		
UNIT II	ADVANCED FEATURES OF C#	9
Interfaces – Arrays – Indexers and Collections – Strings and Regular Expressions – Handling Exceptions – Delegates and Events.		
UNIT III	APPLICATION DEVELOPMENT ON .NET	9
Building Windows Applications – Accessing Data with ADO.NET – Programming Web Applications with Web Forms – Programming Web Services.		
UNIT IV	THE CLR AND THE .NET FRAMEWORK	9
The Architecture – Deployment – Assemblies – Shared Assemblies – Automatic Memory Management – CLR Hosting – Appdomains – Reflection.		
UNIT V	REMOTING AND WEB SERVICES TECHNOLOGY	9
Marshalling – Remoting – Threads – Synchronization – Streams – Web Services.		
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CS4009 – DATA WAREHOUSING AND DATA MINING

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UNIT I OVERVIEW 9

Definition of Data Mining – Data Mining Vs Query Tools – Machine Learning – Taxonomy of Data Mining Tasks – Steps in Data Mining Process – Overview of Data Mining Techniques.

UNIT II DATA WAREHOUSING 9

Definition – Multidimensional Data Model – Data Cube – Dimension Modeling – OLAP Operations – Warehouse Schema – Data Warehouse Architecture – Data Mart – Meta Data – Types of Meta Data – Data Warehouse Backend Process – Development Life Cycle.

UNIT III DATA PRE PROCESSING AND CHARACTERIZATION 9

Data Cleaning – Data Integration and Transformation – Data Reduction – Discretization and Concept Hierarchy Generation – Primitives – Data Mining Query Language – Generalization – Summarization – Analytical Characterization and Comparison – Association Rule – Mining Multi-Dimensional data from Transactional Databases and Relational Databases.

UNIT IV CLASSIFICATION 9

Classification – Decision Tree Induction – Bayesian Classification – Prediction – Back Propagation – Cluster Analysis – Hierarchical Method – Density Based Method – Grid Based Method – Outlier Analysis.

UNIT V APPLICATIONS 9

Tools – Applications – Case Study.

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CS4010 – HIGH SPEED NETWORKS

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UNIT I HIGH SPEED NETWORKS 9

Frame Relay Networks – Asynchronous transfer Mode – ATM Protocol Architecture, ATM Logical Connection – ATM Cell – ATM Service Categories – AAL High Speed LAN's – Fast Ethernet – Gigabit Ethernet – Fibre Channel – Wireless LAN's Applications – Requirements – Architecture of 802.11.

UNIT II CONGESTION AND TRAFFIC MANAGEMENT 9

Queuing Analysis – Queuing Models – Single Server Queues – Effects of Congestion – Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT III TCP AND ATM CONGESTION CONTROL 9

TCP Flow Control – TCP Congestion Control – Retransmission – Timer Management – Exponential RTO Back off – KARN's Algorithm – Window Management – Performance of TCP over ATM. Traffic and Congestion Control in ATM – Requirements – Attributes – Traffic Management Framework – Traffic Control – ABR traffic Management – ABR Rate Control – RM Cell Formats – ABR Capacity Allocations – GFR Traffic Management.

UNIT IV INTEGRATED AND DIFFERENTIATED SERVICES 9

Integrated Services Architecture – Approach – Components – Services – Queuing Discipline – FQ – PS – BRFQ – GPS – WFQ – Random Early Detection – Differentiated Services.

UNIT V PROTOCOLS FOR QOS SUPPORT 9

RSVP – Goals and Characteristics – Data Flow – RSVP Operations – Protocol Mechanisms – Multiprotocol Label Switching – Operations – Label Stacking – Protocol details – RTP – Protocol Architecture – Data Transfer Protocol – RTCP.

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CS4011 – COMPONENT BASED TECHNOLOGY

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UNIT I FUNDAMENTALS 9

Software Components – Objects – Fundamental Properties of Components Technology – Modules – Interfaces – Callbacks – Directory Services – Components Architecture – Components and Middleware.

UNIT II JAVA COMPONENT TECHNOLOGIES 9

Threads – Java Beans – Events and Connections – Properties – Introspection – JAR Files – Reflection – Object Serialization – Enterprise Java Beans – Distributed Object Models – RMI and RMI-IIOP.

UNIT III CORBA TECHNOLOGIES 9

Java and CORBA – Interface Definition Language – Object Request Broker – System Object Model – Portable Object Adapter – CORBA Services – CORBA Component Model – Containers – Application Server – Model Driven Architecture.

UNIT IV COM AND .NET TECHNOLOGIES 9

COM – Distributed COM – Object Reuse – Interfaces and Versioning – Dispatch Interfaces – Connectable Object – OLE Containers and Servers – Active X Controls – .Net Components – Assemblies – Appdomains – Contexts – Reflection – Remoting.

UNIT V COMPONENTS FRAMEWORKS AND DEVELOPMENTS 9

Connectors – Contexts – EJB Containers – CLR Contexts and Channels – Black Box Components Framework – Directory Objects – Cross-Development Environment – Component-Oriented Programming – Component Design and Implementation Tools – Testing Tools – Assembly Tools.

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CS4012 – EMBEDDED SYSTEMS

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UNIT I INTRODUCTION 9

Challenges of Embedded Systems – Fundamental Components – Examples of Embedded Systems- Hardware Fundamentals – Gates – Timing Diagrams – Memory – Direct Memory Access – Buses – Interrupts – Schematics – Built Process of Embedded Systems.

UNIT II MEMORY MANAGEMENT AND INTERRUPTS 9

Memory Access Procedure – Types of Memory – Memory Management Methods – Pointer Related Issues – Polling Versus Interrupts – Types of Interrupts – Interrupt Latency – Reentrancy – Interrupt Priority – Programmable Interrupt Controllers – Interrupt Service Routines.

UNIT III REAL-TIME OPERATING SYSTEMS RTOS 9

Desktop Operating Systems Versus RTOS – Need for Board Support Packages – Task Management – Task Management – Race Conditions – Priority Inversion – Scheduling – Inter Task Communication – Timers – Semaphores – Queues.

UNIT IV EMBEDDED SYSTEMS DESIGN AND IMPLEMENTATION 9

Requirements of an Embedded System – Architecture Style and Patterns – Design Practices – Implementation Aspects and Choices.

UNIT V EMBEDDED SOFTWARE DEVELOPMENTS TOOLS 9

Host and Target Machines – Cross Compilers – Linker and Locators for Embedded Software – Address Resolution – Locating Program Components – Initialized Data and Constant String – Prom Programmers – ROM Emulators – Flash Memory.

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CS4013 – SOFTWARE TESTING AND QUALITY ASSURANCE

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UNIT I PRINCIPLES OF PRODUCT QUALITY 9

Ethical Basics for Software Quality – Total Quality Management Principles – Software Processes and Methodologies – Quality Standards – Practices and Conventions – Software Configuration Management – Reviews and Audits – Improving Quality with Methodologies – Structured/ Information Engineering – Measuring Customer Satisfaction – Reliability Models – Reliability Growth Models – Software Quality Engineering – Defining Quality Requirements – Management Issues for Software Quality – Data Quality Control – Benchmarking and Certification.

UNIT II SOFTWARE QUALITY ASSURANCE PLAN 9

Writing Software Requirements and Design Specifications – Analyzing Software Documents Using Inspections and Walkthroughs – Software Configuration Management – Software Metrics – Lines of Code – Cyclomatic Complexity – Function Points – Feature Points – Software Cost Estimation (COCOMO) – Quality Management Standards – ISO and Ticket Initiative – Accepted Process Models (Eg.CMM) – Reliability.

UNIT III TEST CASE DESIGN 9

Testing as an Engineering Activity – Role of Process in Software Quality – Testing as a process – Basic Definitions – Software Testing Principles – The Tester’s Role in Software Development Organisation – Origins of Defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Development/Tester Support for Developing a Defect Repository – Testing Strategies – The Smarter – Test Case Design Strategies – Using Black Box Approach to Test Case Design – Random Testing – Equivalence Class Partitioning– Boundary Value Analysis – Other Black Box Design Approaches – Black Box Testing and COTS – Using White Box Approach to Test Design – Test Adequacy – Criteria – Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White Box Based Test Design – Additional White Box Test Design Approach – Evaluating Test Adequacy Criteria – Levels of Testing and Different Types of Testing.

UNIT IV TEST MANAGEMENT 9

Basic Concepts – Testing and Debugging Goals and Policies – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – Reporting Test Results – The Role of Three Groups in Test Planning and Policy Development – Process and Engineering Disciplines – Test Specialist – Skills Needed by a Test Specialist – Building a Test Group .

UNIT V CONTROLLING AND MONITORING 9

Defining Terms – Measurement and Milestones for Controlling and Monitoring – Status Meeting – Reports and Control Issues – Criteria for Test Completion – SCM –Types of Reviews – Developing a Review Program – Components of Review Plans – Reporting Review Results.

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CS4015 – VISUAL PROGRAMMING

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UNIT I WINDOWS PROGRAMMING 9

The Windows Programming Model – Event Driven Programming – GUI Concepts – Overview of Windows Programming – Creating the Window – Displaying the Window – Message Loop – Windows Procedure – WM_PAINT Message – WM_DESTROY Message – Data Types – Resources – GDI – Device Context – Text OUTPUT – Scroll Bars – Keyboard – Mouse – Menus.

UNIT II VISUAL C++ PROGRAMMING 9

Visual C++ Components – Microsoft Foundation Classes Library – Getting Started with AppWizard – Class Wizard – Event Handling – Keyboard and Mouse Events – Graphics Device Interface – Colors – Fonts – Single and Multiple Document Interface – Reading and Writing Documents – Basic – Pen – Brush – WM_SIZE – WM_CHAR Messages – Resources – Bitmaps Creation – Usage of BMP and Displaying a File Existing as a BMP.

UNIT III CONTROLS 9

Dialog Based Applications – Controls – Animate Control – List Box – Combo Box – Label – Edit Box – Radio Button – Frame – Command Button – Image List – CRect Tracker – Tree Control – CTab Control – Dynamic Controls – Slider Control – Progress Control – Inheriting CTreeView – CRicheditView.

UNIT IV DOCUMENT CLASS 9

Document View Architecture – Serialization – Multithreading – Menus – Keyboard Accelerators – Toolbars – Tool Tip – Property Sheet – Model Dialog – Modeless Dialog – CColorDialog – CFileDialog.

UNIT V ADVANCED CONCEPTS 9

Status Bar – To display in existing Status Bar – Creating new Status Bar – Splitter Windows and Multiple Views – Dynamic Link Library – Data Base Management with ODBC – TCP/IP – Winsock and Wininet – ActiveX Control – Creation and Usage – Container Class.

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CS4016 – XML AND WEB SERVICES

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UNIT I XML TECHNOLOGY FAMILY 9

XML – Benefits – Advantages of XML over HTML – EDI – Databases – XML Based Standards – DTD – XML Schemas – X – Files – XML Processing – DOM – SAX – Presentation Technologies – XSL – XFORMS – XHTML – VoiceXML –Transformation – XSLT – XLINK – XPATH – XQuery.

UNIT II ARCHITECTING WEB SERVICES 9

Business Motivations for Web Services – B2B – B2C – Technical Motivations –Limitations of CORBA and DCOM – Service – Oriented Architecture (SOA) – Architecting Web Services – Implementation View – Web Services Technology Stack – Logical View – Composition of Web Services – Deployment View – From Application Server to Peer to Peer – Process View – Life in the Runtime.

UNIT III WEB SERVICES BUILDING BLOCK 9

Transport Protocols for Web Services – Messaging with Web Services – Protocols –SOAP Describing Web Services – WSDL – Anatomy of WSDL – Manipulating WSDL – Web Service Policy Discovering Web Services – UDDI – Anatomy of UDDI – Web Service Inspection – Ad hoc Discovery – Securing Web Services.

UNIT IV IMPLEMENTING XML IN E-BUSINESS 9

B2B – B2C Applications – Different Types of BWB Interaction – Components of E – Business XML Systems – ebBML – RosettaNet – Applied XML in Vertical Industry –Web Services for Mobile Devices.

UNIT V XML AND CONTENT MANAGEMENT 9

Semantic Web – Role of Meta Data in Web Content – Resource Description Framework – RDF SCHEMA – Architecture of Semantic Web – Content Management Workflow – XLANG – WSFL.

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CS4017 – DESIGN AND ANALYSIS OF ALGORITHMS

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UNIT I FUNDAMENTALS 9

Algorithms – Analyzing Algorithms – Asymptotic Notation – Standard Notations and Common Functions – Summation Formulas and Properties – Bounding Summations – Substitution Method – Iteration Method – Master Method – Red –Black Trees – B-Trees.

UNIT II SORTING 9

Heap Sort – Heaps – Maintaining the Heap property – Building a Heap – The Heap Sort Algorithm – Priority Queues – Quick Sort – Description of Quick Sort – Performance of Quick Sort – Randomized Version of Quick Sort – Analysis of Quick Sort – Lower Bound for Sorting – Counting Sort – Radix Sort – Bucket Sort.

UNIT III DYNAMIC PROGRAMMING AND GREEDY ALGORITHMS 9

Matrix Chain Multiplication – Elements of Dynamic Programming – Longest Common Subsequence – Optimal Polygon Triangulation – Greedy Algorithms – An Activity Selection Problem – Elements of Greedy Strategy – Huffman Codes – Amortized Analysis – The Aggregate Method.

UNIT IV ADVANCED ALGORITHMS 9

Flow Networks – The Ford – Fulkerson Method – Maximum Bipartite Matching – The Naïve String Matching Algorithm – The Rabin – Karp Algorithm – String Matching with Finite Automata – The Knuth – Morris – Pratt Algorithm – The Boyer – Moore Algorithm.

UNIT V NP-COMPLETENESS AND APPROXIMATION ALGORITHMS 9

Polynomial Time – Polynomial Time Verification – NP Completeness and Reducibility – NP Completeness Proofs – NP Complete Problems – The vertex – Cover Problem – The Subset Sum Problem

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CS4018 – DISTRIBUTED SYSTEMS

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UNIT I INTRODUCTION AND COMMUNICATION 8

Introduction – Middleware – Client-Server Model - Remote Procedure Call – Message-Oriented Communication – Threads in Distributed Systems – Code Migration.

UNIT II DISTRIBUTED OPERATING SYSTEMS 12

Issues in Distributed Operating Systems – Lamport’s Logical Clock – Vectors Clock – Casual Ordering – Global States – Election Algorithm – Distributed Transactions – Distributed Dead-Lock – Agreement Protocol – Distributed File Systems.

UNIT III DISTRIBUTED SHARED MEMORY AND FAULT TOLERANCE 9

Introduction – Data Centric Consistency Models – Client Centric Consistency Models – Distribution Protocol – Consistency Protocol – Sequential Consistency and Ivy – Release Consistency and Munin – Introduction to Fault – Distributed Commit.

UNIT IV FAULT TOLERANCE AND CONSENSUS 8

Introduction to Fault Tolerance – Distributed Commit Protocols – Byzantine Fault Tolerance – Impossibilities in Fault Tolerance.

UNIT V CASE STUDIES 8

Distributed Object Based System – CORBA – COM and Globe – Distributed Coordination-based System – TIB/Rendenvous – JINI.

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EC4253 – DIGITAL SIGNAL PROCESSING

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UNIT I SIGNALS SYSTEMS 9

Basic Elements of Digital Signal Processing – Concepts of Frequency in Continuous Time and Discrete Time Signals – Sampling Theorem – Discrete Time Signals – Discrete Time Systems – Analysis of Linear Time Invariant Systems – Z Transform – Convolution and Correlation.

UNIT II FFT 9

Introduction to DFT – Efficient Computation of DFT Properties of DFT – FFT Algorithms – Radix-2 and Radix-4 FFT Algorithms – Decimation in Time – Decimation in Frequency Algorithms – Use of FFT Algorithms in Linear Filtering and Correlation.

UNIT III IIR FILTER DESIGN 9

Structure of IIR – System Design of Discrete Time IIR Filter from Continuous Time Filter – IIR Filter Design by Impulse Invariant – Bilinear Transformation – Approximation Derivatives – Design of IIR Filter in the Frequency Domain.

UNIT IV FIR FILTER DESIGN 9

Symmetric and Asymmetric FIR Filters – Linear Phase Filter – Windowing Technique – Rectangular – Kaiser Windows – Frequency Sampling Techniques – Structures for FIR Systems.

UNIT V FINITE WORD LENGTH EFFECTS 9

Quantization Noise – Derivation for Quantization Noise Power – Fixed Point and Binary Floating Number Representation – Comparison – Over Flow Error – Truncation Error – Coefficient Quantization Error – Limit Cycle Oscillation – Signal Scaling – Analytical Model of Sample and Hold Operations – Application of DSP – Model of Speech Wave Form – Vocoder.

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