ANNA UNIVERSITY CHENNAI :: CHENNAI 600 025
UNIVERSITY DEPARTMENTS

CURRICULUM – R 2009

B.TECH. (PART TIME) INFORMATION TECHNOLOGY

SEMESTER I

CODE NO.	COURSE TITLE	L	T	P	C
PTMA 9111	Applied Mathematics	3	0	0	3
PTPH 9111	Applied Physics	3	0	0	3
PTCY 9111	Applied Chemistry	3	0	0	3
PTCS 9151	Programming and Data Structures I	3	0	0	3
PTCS 9153	Programming and Data Structures Laboratory - I	0	0	3	2
	TOTAL	**12**	**0**	**3**	**14**

SEMESTER II

CODE NO.	COURSE TITLE	L	T	P	C
PTMA 9212	Transforms and Partial Differential Equations	3	0	0	3
PTEC 9161	Electronic Devices and Circuits	3	0	0	3
PTCS 9203	Programming and Data Structures II	3	0	0	3
PTIT 9201	Computer Organization	3	0	0	3
PTCS 9206	Programming and Data Structures Laboratory II	0	0	3	2
	TOTAL	**12**	**0**	**3**	**14**

SEMESTER III

CODE NO.	COURSE TITLE	L	T	P	C
PTMA 9265	Discrete Mathematics	3	0	0	3
PTCS 9202	Database Management Systems	3	0	0	3
PTCS 9201	Design and Analysis of Algorithms	3	0	0	3
PTCS 9254	Software Engineering	3	0	0	3
PTCS 9205	Database Management Systems Laboratory	0	0	3	2
	TOTAL	**12**	**0**	**3**	**14**

SEMESTER IV

CODE NO	COURSE TITLE	L	T	P	C
PTCS 9252	Operating Systems	3	0	0	3
PTCS 9253	Web Technology	3	0	0	3
PTIT 9303	Computer Networks	3	0	0	3
PTIT 9252	Embedded Systems	3	0	0	3
PTCS 9256	Web Technology Laboratory	0	0	3	2
	TOTAL	**12**	**0**	**3**	**14**

SEMESTER V

CODE NO	COURSE TITLE	L	T	P	C
PTIT9301	Software Project Management	3	0	0	3
PTCS 9027	Data Warehousing and Mining	3	0	0	3
PTIT9304	Distributed Systems	3	0	0	3
E	Elective I	3	0	0	3
PTCS9306	Case Tools Laboratory	0	0	3	2
	TOTAL	**12**	**0**	**3**	**14**

SEMESTER VI

CODE NO	COURSE TITLE	L	T	P	C
PTIT9351	Service Oriented Architecture	3	0	0	3
PTIT9352	Wireless Networks	3	0	0	3
PTIT9354	Grid Computing	3	0	0	3
E	Elective II	3	0	0	3
PTCS 9356	Free and Open Source Software Lab	0	0	3	2
	TOTAL	**12**	**0**	**3**	**14**

SEMESTER VII

CODE NO	COURSE TITLE	L	T	P	C
PTIT9401	Software Testing	3	0	0	3
PTIT9402	Cryptography and Security	3	0	0	3
E	Elective III	3	0	0	3
E	Elective IV	3	0	0	3
PTIT9451	Project Work	0	0	12	6
	TOTAL	**12**	**0**	**12**	**18**

TOTAL NUMBER OF CREDITS: 102

LIST OF ELECTIVES

CODE NO	COURSE TITLE	L	T	P	C
PTCS9351	Digital Signal Processing	3	0	0	3
PTCS9022	Internet Programming	3	0	0	3
PTCS9024	Advanced Database Technology	3	0	0	3
PTCS9023	Unix Internals	3	0	0	3
PTIT9021	Visual Programming	3	0	0	3
PTCS9029	.Net and C# Programming	3	0	0	3
PTIT9022	Computational Linguistics	3	0	0	3
PTIT9023	Artificial Intelligence	3	0	0	3
PTIT9024	Digital Image Processing	3	0	0	3
PTCS9032	Graph theory	3	0	0	3
PTCS9035	Free/Open Source Software	3	0	0	3
PTCS9075	Software Agents	3	0	0	3
PTCS9048	Adhoc and Sensor Networks	3	0	0	3
PTIT9025	Routers and Network Processors	3	0	0	3
PTIT9026	TCP/IP Design and Implementation	3	0	0	3
PTIT9027	Software Metrics	3	0	0	3
PTGE9021	Professional Ethics in Engineering	3	0	0	3
PTGE9022	Total Quality Management	3	0	0	3
PTGE9023	Fundamentals of Nanoscience	3	0	0	3
PTIT9028	User Interface Design	3	0	0	3
PTIT9029	Software Quality Assurance	3	0	0	3
PTIT9030	Knowledge Engineering	3	0	0	3
PTCS9043	Multi-Core Programming	3	0	0	3
PTCS9045	Programming In .Net	3	0	0	3
PTIT9031	Network Programming and Management	3	0	0	3
PTIT9032	Enterprise Resource Planning	3	0	0	3
PTIT9033	Software Design and Architecture	3	0	0	3
PTIT9035	Soft Computing	3	0	0	3
PTCS9044	Bio Informatics	3	0	0	3
PTIT9036	Management Information Systems	3	0	0	3
PTIT9038	Computer Graphics	3	0	0	3
PTCS9031	Cyber Forensics	3	0	0	3
PTIT9034	Business Process Models	3	0	0	3
PTIT9041	Domain Engineering	3	0	0	3
PTIT 9352	Wireless Communications	3	0	0	3
PTIT9040	Multimedia Networks	3	0	0	3

PTMA 9111 **APPLIED MATHEMATICS** **L T P C**
3 0 0 3

(Common to all branches of B.E / B.Tech (PT) Programmes)

UNIT I MATRICES 9

Characteristic equation – Eigenvalues and Eigenvectors of a real matrix – Properties of eigenvalues and eigenvectors – Cayley – Hamilton Theorem – Diagonalization of matrices - Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms .

UNIT II FUNCTIONS OF SEVERAL VARIABLES 9

Partial derivatives – Homogeneous functions and Euler's theorem – Total derivative – Differentiation of implicit functions – Change of variables – Jacobians – Partial differentiation of implicit functions – Taylor's series for functions of two variables - Maxima and minima of functions of two variables.

UNIT III ANALYTIC FUNCTION 9

Analytic functions – Necessary and sufficient conditions for analyticity – Properties – Harmonic conjugates – Construction of analytic function – Conformal Mapping – Mapping by functions w = a + z , az, 1/z, **-** Bilinear transformation.

UNIT IV COMPLEX INTEGRATION 9

Line Integral – Cauchy's theorem and integral formula – Taylor's and Laurent's Series – Singularities – Residues – Residue theorem – Application of Residue theorem for evaluation of real integrals – Use of circular contour and semicircular contour with no pole on real axis.

UNIT V LAPLACE TRANSFORMS 9

Existence conditions – Transforms of elementary functions – Basic properties – Transforms of derivatives and integrals – Initial and Final value theorems – Inverse transforms – Convolution theorem – Transform of periodic functions – Application to solution of linear ordinary differential equations with constant coefficients.

TOTAL= 45 PERIODS

TEXT BOOKS:

1. Grewal B.S., Higher Engineering Mathematics (40^{th} Edition), Khanna Publishers, Delhi (2007).
2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill Co. Ltd., New Delhi (2007).

REFERENCES:

1. Glyn James, Advanced Modern Engineering Mathematics, Pearson Education (2007).
2. Veerarajan, T., Engineering Mathematics (For First Year), Tata McGraw-Hill Pub. Pvt Ltd., New Delhi (2006).

PTPH 9111 APPLIED PHYSICS L T P C
3 0 0 3

UNIT I ULTRASONICS 9

Introduction – Production – magnetostriction effect - magnetostriction generator- piezoelectric effect - piezoelectric generator- Detection of ultrasonic waves properties – Cavitations - Velocity measurement – acoustic grating - Industrial applications – drilling, welding, soldering and cleaning – SONAR - Non Destructive Testing – pulse echo system through transmission and reflection modes - A, B and C –scan displays, Medical applications - Sonograms

UNIT II LASERS 9

Introduction – Principle of Spontaneous emission and stimulated emission. Population inversion, pumping. Einstein's A and B coefficients - derivation. Types of lasers – He-Ne, CO_2, Nd-YAG, Semiconductor lasers - homojunction and heterojunction (Qualitative)- Industrial Applications - Lasers in welding, heat treatment and cutting – Medical applications - Holography (construction and reconstruction).

UNIT III FIBER OPTICS & APPLICATIONS 9

Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, mode) – Double crucible technique of fibre drawing - Splicing, Loss in optical fibre – attenuation, dispersion, bending - Fibre optical communication system (Block diagram) - Light sources - Detectors - Fibre optic sensors – temperature and displacement - Endoscope.

UNIT IV QUANTUM PHYSICS 9

Black body radiation – Planck's theory (derivation) – Deduction of Wien's displacement law and Rayleigh – Jeans' Law from Planck's theory – Compton effect - Theory and experimental verification – Matter waves – Schrödinger's wave equation – Time independent and time dependent equations – Physical significance of wave function – Particle in a one-dimensional box - Electron microscope - Scanning electron microscope - Transmission electron microscope.

UNIT V CRYSTAL PHYSICS 9

Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – 'd' spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – NaCl, ZnS, diamond and graphite structures – Polymorphism and allotropy - Crystal defects – point, line and surface defects- Burger vector.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Palanisamy, P.K., 'Engineering Physics' Scitech publications, Chennai, (2008).
2. Arumugam M. ' Engineering Physics', Anuradha Publications, Kumbakonam, (2007)
3. Sankar B.N and Pillai S.O. 'A text book of Engineering Physics', New Age International Publishers, New Delhi, 2007.

REFERENCES:

1. R. K. Gaur and S.C. Gupta, 'Engineering Physics' Dhanpat Rai Publications, New Delhi (2003)
2. M.N. Avadhanulu and PG Kshirsagar, 'A Text book of Engineering Physics', S.Chand and company, Ltd., New Delhi, 2005.
3. Serway and Jewett, 'Physics for Scientists and Engineers with Modern Physics', 6th Edition, Thomson Brooks/Cole, Indian reprint (2007)

PTCY 9111 APPLIED CHEMISTRY L T P C
3 0 0 3

UNIT I WATER TREATMENT AND POLLUTION 9

Treatment of water –impurities and disadvantages of hard water-Domestic and Industrial treatment - zeolite and ion exchange processes-Portable water-Boiler feed water – conditioning of boiler feed water. Scale and sludge formation –prevention –caustic embrittlement-boiler corrosion–priming and foaming Sewage treatment–Primary, secondary and tertiary treatment–significance of DO, BOD and COD-desalination – reverse osmosis. Control of water,air and land pollution.

UNIT II FUELS 9

Classification of fuels-Proximate and ultimate analysis of coal- coke manufacture-Otto Hoffman by product method-cracking-thermal and catalytic (fixed bed and fluidized bed)-petroleum-refining-factions-composition and uses synthetic petrol-fischer drops methods- Bergius process- knocking-octane number and cetane number-Preparation, composition and uses of producer gas , water gas and natural gas. Flue gas analysis-Orsat apparatus- gross and net calorific values- calculation of minimum requirement of air(simple calculations)- Explosive range –spontaneous ignition temperature

UNIT III THERMODYNAMICS AND SURFACE CHEMISTRY 9

Second law of thermodynamics-entropy and its significance- criteria for spontaneity- free energy-Gibbs, Helmholts and Gibbs-Helmholts equation-applications and problems – Adsorption –types of adsorption- adsorption of gases on solids- adsorption isotherm-Freundlich and Langmuir isotherms-adsorption of solutes from solutions- applications

UNIT IV ELECTROCHEMISTRY - CORROSION AND CATALYSIS 9

Reversible and irreversible cells-electrode potentials-types of electrodes-cell reactions-Nernst equations- electrochemical and galvanic series-fuel cells and solar cells-corrosion-chemical and electrochemical-factors affecting corrosion-sacrifical anode-impressed current cathodic protection-surface treatment and protective coating-Catalysis –classification-characteristics of catalysis – auto catalysis- enzyme catalysis

UNIT V POLYMERS-COMPOSITES AND NANOCHEMISTRY 9

Polymers-definition-classification-thermoplastics and thermosetting plastics differences Preparation, properties and uses of polystyrene, bakelite, PET, polyurethane, Teflon, ureafromaldehyde, polycarbonates-Elastomers-Preparation, properties of Buna-S, nitrile, neoperene and butyl rubber, silicon rubber. Composites-FRP. Nanochemistry-introduction to nanochemistry- preparation and properties of nonmaterial-nano rods, nano wires-nanotubes-carbon nanotubes and their applications.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Dhara S S A text book of Engineering Chemistry, S.Chand & Co Ltd, New Delhi,2002
2. Jain. P.C and Monica Jain, Engineering Chemistry,Dhanpet Rai & Sons, New Delhi 2001

REFERENCES:

1. Puri B R.,Sharma L R and Madhan S. Pathania, Principles of Physical Chemistry, Shoban Lal Nagin Chand & Co. Jalandar-2000.
2. G.B. Sergeev, Nanochemistry.Elsevier Science, New York,2006
3. V.R.Gowarikar, N.V.Viswanathan and Jayadev Sreedhar, Polymer Science, Wiley Eastern Limited, Madras (2006).

PTCS 9151 PROGRAMMING AND DATA STRUCTURES I **L T P C**
3 0 0 3

AIM:
The aim is to review the basics of C programming and to introduce the concepts of Data Structures.

OBJECTIVES:
- To introduce the basics of C programming language.
- To introduce the concepts of ADTs.
- To introduce the concepts of Hashing and Sorting.

UNIT I **8**
Programming Style: Names – Expressions and Statements – Consistency and Idioms – Function Macros – Magic Numbers – Comments – Review of C Programming: Types, Operators and Expressions – Control Flow – Functions and Program

UNIT II **8**
C Programming: Pointers and Arrays – Structures – Input and Output - Files – Preprocessor.

UNIT III **10**
Lists, Stacks, and Queues: Abstract Data Types (ADTs) – List ADT – Stack ADT – Queue ADT

UNIT IV **9**
Trees: Preliminaries – Binary Trees – Search Tree ADT – Binary Search Trees – Hashing: ADT – Hash Function – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing

UNIT V **10**
Sorting: Insertion Sort – Shell Sort – Heap Sort – Merge Sort – Quick Sort – External Sorting

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", 2nd ed., Pearson Education, 1988. (Units 1 and 2)
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd ed., Pearson Education, 1997. (Units 3, 4, 5)

REFERENCES:

1. Robert Kruse, C.L. Tondo, Bruce Leung, "Data Structures,Program Design in C", 2nd ed., Pearson Education, 1997.
2. Brian W. Kernighan and Robert Pike, "The Practice of Programming", Pearson Education, 1999.
3. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
4. Stephen G. Kochan, "Programming in C", 3rd ed., Pearson Education, 2005.
5. Herbert Schildt, "C: The Complete Reference", 4th ed., Tata McGraw-Hill, 2000.
6. Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J. Augenstein, "Data Structures using C", Pearson Education, 1998

PTCS 9153 PROGRAMMING AND DATA STRUCTURES LABORATORY I L T P C
0 0 3 2

- Programs for Control Structures, Arrays, and Functions.
- Programs using pointers.
- Programs using structures.
- Programs using file IO and preprocessing.
- Array implementation of List Abstract Data Type (ADT)
- Linked list implementation and cursor implementation of List ADT
- Stack ADT – Array and linked list implementations
- Implement any Stack application using an appropriate header file for the Stack ADT, a separate source file for the array implementation of the Stack ADT, and a separate source file for the application. Use the linked list implementation instead of the array implementation, keeping the other files the same.
- Implement source files for other applications of the Stack ADT and use the array and linked list implementations interchangeably.
- Implement the Queue ADT in different ways and use it for different applications.
- Search ADT using different implementations including Sorted Link List, Binary Search Tree hashing, and different applications.
- Sorting

TOTAL: 45 PERIODS

PTMA 9212 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS L T P C
3 0 0 3

AIM:

- To facilitate the understanding of the principles and to cultivate the art of formulating physical problems in the language of mathematics.

OBJECTIVES:

- To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems
- To acquaint the student with Fourier transform techniques used in wide variety of situations in which the functions used are not periodic
- To introduce the effective mathematical tools for the solutions of partial differential equations that model physical processes
- To develop Z- transform techniques which will perform the same task for discrete time systems as Laplace Transform, a valuable aid in analysis of continuous time systems

UNIT I FOURIER SERIES 9

Dirichlet's conditions – General Fourier series – Odd and even functions – Half-range Sine and Cosine series – Complex form of Fourier series – Parseval's identity – Harmonic Analysis.

UNIT II FOURIER TRANSFORM 9

Fourier integral theorem – Fourier transform pair-Sine and Cosine transforms – Properties – Transform of elementary functions – Convolution theorem – Parseval's identity.

UNIT III PARTIAL DIFFERENTIAL EQUATIONS 9

Formation – Solutions of first order equations – Standard types and Equations reducible to standard types – Singular solutions – Lagrange's Linear equation – Integral surface passing through a given curve – Solution of linear equations of higher order with constant coefficients.

UNIT IV APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS 9

Method of separation of Variables – Solutions of one dimensional wave equation and one-dimensional heat equation – Steady state solution of two-dimensional heat equation – Fourier series solutions in Cartesian coordinates.

UNIT V Z – TRANSFORM AND DIFFERENCE EQUATIONS 9

Z-transform – Elementary properties – Inverse Z-transform – Convolution theorem – Initial and Final value theorems – Formation of difference equation – Solution of difference equation using Z-transform.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Grewal, B.S. "Higher Engineering Mathematics", Khanna Publications (2007)

REFERENCES:

1. Glyn James, "Advanced Modern Engineering Mathematics, Pearson Education (2007)
2. Ramana, B.V. "Higher Engineering Mathematics" Tata McGraw Hill (2007).
3. Bali, N.P. and Manish Goyal, "A Text Book of Engineering 7th Edition (2007) Lakshmi Publications (P) Limited, New Delhi.

PTEC 9161 ELECTRONIC DEVICES AND CIRCUITS L T P C
3 0 0 3

UNIT I VOLTAGE AND CURRENT LAWS 9

Nodes, Paths, Loops, and Branches; Kirchoff's Current Law, Kirchoff's Voltage Law, Single Loop Circuit, Single Node-Pair Circuit, Series and Parellel Connected Independent Sources, Resistors in Series and Parellel, Voltage and Current Division

UNIT II CIRCUIT ANALYSIS TECHNIQUES 9

Linearity and Superposition, Sources Transformation, Thevinin and Norton Equivalent Circuits, Maximum Power Transfer, Delta-Wye Conversion, Single Phase and 3 Phase Circuits-Power Factor-Power-Concept of Phasor Diagrams.

UNIT III SEMICONDUCTOR DEVICES 9

PN-Junction Diode- Drift and Diffusion Current-Zener Diode-Zener Regulator-BJT-V-I Charecteristics-CE Configuration-Current Equation h-Parameter Model.JFET- V-I Charesteristics- Current Equation- Transconductance MOSFET-Types DMOS, EMOS – V-I Charesteristics-Moll Current Equation Equalitine Treatment only.

UNIT I V RECTIFIER, AMPLIFIER AND OSCILLATOR 9

FWR-Filter-Capacitors Input Filter-Choke Input Filter – CE Amplification with and without feedback – Analysis and Frequency Response – CS MOSFET Amplifier - Analysis

UNIT V OPERATION AMPLIFIER 9

Introduction of an Inverting Amplifier, Non Inverting Amplifier, Basic Application of Operation Amplifier: Subractor, Summing Amplifier, Digital to Analogue nvertor, Low Pass Filter, First Order Low Pass Filter, First Order High Pass Filter, Integrator, Differentiator.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. David A.Bell 'Electronic Devices and Circuit/ -Oxford press-2008.
2. Robert T.Paynter Introductory Electronic Devices and Circuits – Pearson Education-Sixth Edition

REFERENCES:

1. Denal A.Neamar, Electronic Circuit Analysis and Design – Second Edition – Tata MCGraw Hill, 2002.
2. Adel S.Sedia Keanath Cswith Micro Electronic Circuit-Fourth Edition-Oxford University Press-1998.

PTCS 9203 PROGRAMMING AND DATA STRUCTURES II **L T P C**
3 0 0 3

AIM:

- The aim is to review the basics of C programming and to introduce the concepts of Data Structures.

OBJECTIVES:

- To introduce the basics of C programming language.
- To introduce the concepts of ADTs.
- To introduce the concepts of Hashing and Sorting.

UNIT I **8**

Programming Style: Names – Expressions and Statements – Consistency and Idioms – Function Macros – Magic Numbers – Comments – Review of C Programming: Types, Operators and Expressions – Control Flow – Functions and Program Structure

UNIT II **8**

C Programming: Pointers and Arrays – Structures – Input and Output - Files – Preprocessor.

UNIT III **10**

Lists, Stacks, and Queues: Abstract Data Types (ADTs) – List ADT – Stack ADT – Queue ADT

UNIT IV **9**

Trees: Preliminaries – Binary Trees – Search Tree ADT – Binary Search Trees – Hashing: ADT – Hash Function – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing

UNIT V **10**

Sorting: Insertion Sort – Shell Sort – Heap Sort – Merge Sort – Quick Sort – External Sorting

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, “The C Programming Language”, 2nd ed., Pearson Education, 1988. (Units 1 and 2)
2. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, 2nd ed., Pearson Education, 1997. (Units 3, 4, 5)

REFERENCES:

1. Brian W. Kernighan and Robert Pike, “The Practice of Programming”, Pearson Education, 1999.
2. Aho, Hopcroft and Ullman, “Data Structures and Algorithms”, Pearson Education, 1983.
3. Stephen G. Kochan, “Programming in C”, 3rd ed., Pearson Education, 2005.
4. Herbert Schildt, “C: The Complete Reference”, 4th ed., Tata McGraw-Hill, 2000.
5. Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J. Augenstein, “Data Structures using C”, Pearson Education, 1998.
6. Robert Kruse, C.L. Tondo, Bruce Leung, “Data Structures,Program Design in C”, 2nd ed., Pearson Education, 1997.

PTIT 9201 COMPUTER ORGANIZATION L T P C
3 1 0 4

AIM :

- To understand the basics of digital design, the design of various components of the computer system and its organization.

OBJECTIVES:

- To understand the fundamentals of Boolean logic and functions.
- To design and realize these functions with basic gates, and other components using combinational and sequential logic.
- To understand the design and organization of a von-neumann computer ystem.
- To comprehend the importance of the hardware-software interface.

UNIT I DIGITAL FUNDAMENTALS 9 +3

Number systems and conversions – Boolean algebra and simplification – Minimization Of Boolean functions – Karnaugh map – Quine McCluskey tabulation method **–** Logic gates – NAND – NOR implementation.

UNIT II COMBINATIONAL AND SEQUENTIAL CIRCUITS 9+3

Design of combinational circuits – Adder / Subtracter – Encoder – Decoder – Mux / Demux – Comparators – Flip Flops – Triggering – Master – Slave Flip Flop – State diagrams and minimization – Counters – Registers.

UNIT III BASIC STRUCTURE OF COMPUTERS 9 +3

Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes – RISC – CISC. ALU design – Fixed point and floating point operations.

UNIT IV PROCESSOR DESIGN 9 +3

Fundamental concepts – Execution of a complete instruction – Hardwired control – Micro programmed control. Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations

UNIT V MEMORY AND I/O SYSTEMS 9 +3

Memory Technology – Memory hierarchy – Cache Memory – Design Methods – Virtual Memory – Input/Output System – Programmed I/O – DMA and Interrupts – Functions of I/O devices and interfaces.

L : 45 , T : 15 ,TOTAL : 60 PERIODS

TEXT BOOKS:

1. Morris Mano, “Digital Design”, Third Edition, Pearson Education, 2002.
2. Carl Hamacher, Zvonko Vranesic And Safwat Zaky, “Computer Organization”, Fifth Edition,Tata McGraw Hill, 2002.

REFERENCES:

1. Charles H. Roth, Jr., “Fundamentals of Logic Design”, Fifth Edition, Jaico Publishing House, 2003.
2. William Stallings, “Computer Organization and Architecture – Designing for Performance”, Sixth Edition, Pearson Education, 2003.
3. David A. Patterson And John L. Hennessy, “Computer Organization and Design: The Hardware/Software Interface”, Third Edition, Elsevier, 2005.
4. John P. Hayes, “Computer Architecture and Organization”, Third Edition, Tata McGraw Hill, 1998.

PTCS 9206 PROGRAMMING AND DATA STRUCTURES LAB II **L T P C**
0 0 3 2

Experiments in the following:

1. Data abstraction, Implementation of any one of the following List, Stack, Queue ADTs, using Header files, Separate compilation of implementation and application. Search ADT, Binary Search Tree., Header files, Separate Compilation.

2. Use of Standard Template Library: Strings, Containers

3. Use of STL: Iterators

4. Operator Overloading

5. Templates,

6. Exception handling, Class Hierarchies

7. AVL Tree

8. Splay Tree

9. B Tree

10. Graph algorithms

TOTAL: 45 PERIODS

PTMA9264 DISCRETE MATHEMATICS L T P C
3 1 0 4

AIM:

- To extend student's Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

OBJECTIVES:

At the end of the course, students would

- Have knowledge of the concepts needed to test the logic of a program.
- Have an understanding in identifying structures on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.
- Be aware of the counting principles
- Be exposed to concepts and properties of algebraic structures such as semi groups, monoids and groups.

UNIT I LOGIC AND PROOFS 9 + 3

Propositional Logic – Propositional equivalences-Predicates and quantifiers – Nested Quantifiers – Rules of inference-introduction to proofs – proof methods and strategy.

UNIT II COMBINATORY 9 + 3

Mathematical induction – Strong induction and well ordering – The basics of counting - The pigeonhole principle – Permutations and combinations – Recurrence relations-Solving linear recurrence relations-generating functions – Inclusion and exclusion and applications.

UNIT III GRAPHS 9 + 3

Graphs and graph models – Graph terminology and special types of graphs Representing graphs and graph isomorphism – connectivity – Euler and Hamilton paths.

UNIT IV ALGEBRAIC STRUCTURES 9 + 3

Algebraic systems – Semi groups and monoids – Groups-Subgroups and homomorphisms – Cosets and Lagrange's theorem – Ring & Fields.

UNIT V LATTICES AND BOOLEAN ALGEBRA 9 + 3

Partial ordering – Posets – Lattices as Posets – Properties of lattices-Lattices as algebraic systems – Sub lattices – direct product and Homomorphism – Some special lattices – Boolean algebra

L: 45, T: 15, TOTAL= 60 PERIODS

TEXT BOOKS:

1. Kenneth H.Rosen, "Discrete Mathematics and its Applications", 6th Edition, Special Indian edition , Tata McGraw – Hill Pub. Co. Ltd., New Delhi, (2007).
2. Trembly J.P. and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 30th Re-print (2007).

REFERENCES:

1. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, (2002).
2. Thomas Koshy,"Discrete Mathematics with Applications", Elsevier Publications, (2006).
3. Seymour Lipschutz and Mark Lipson," Discrete Mathematics", Schaum's Outlines, Tata McGraw – Hill Pub. Co. Ltd., New Delhi, 2007, Second edition, Fifth reprint, (2007).

PTCS 9202 DATABASE MANAGEMENT SYSTEMS **L T P C**
3 0 0 3

AIM:

- To provide a strong foundation in database technology and an introduction to the current trends in this field.

OBJECTIVES:

- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To have an introductory knowledge about the Storage and Query processing techniques

UNIT I INTRODUCTION **9**

Purpose of Database System -– Views of data – Data Models – Database Languages –– Database System Architecture – Database users and Administrator – Entity– Relationship model – E-R Diagrams -- Introduction to relational databases

UNIT II RELATIONAL MODEL **9**

The relational Model – The catalog- Types– Keys - Relational Algebra – Domain Relational Calculus – Tuple Relational Calculus - Fundamental operations – Additional Operations- SQL fundamentals - Integrity – Triggers - Security – Advanced SQL features –Embedded SQL– Dynamic SQL- Missing Information– Views – Introduction to Distributed Databases and Client/Server Databases

UNIT III DATABASE DESIG **9**

Functional Dependencies – Non-loss Decomposition – Functional Dependencies – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form- Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form

UNIT IV TRANSACTIONS **9**

Transaction Concepts - Transaction Recovery – ACID Properties – System Recovery – Media Recovery – Two Phase Commit - Save Points – SQL Facilities for recovery – Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Intent Locking – Deadlock- Serializability – Recovery Isolation Levels – SQL Facilities for Concurrency

UNIT V 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 – Static Hashing – Dynamic Hashing – Query Processing Overview – Catalog Information for Cost Estimation – Selection Operation – Sorting – Join Operation – Database Tuning.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", Fifth Edition, Tata McGraw Hill, 2006 (Unit I and Unit-V) .
2. C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.(Unit II, III and IV)

REFERENCES:

1. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", FourthEdition , Pearson / Addision wesley, 2007.
2. Raghu Ramakrishnan, "Database Management Systems", Third Edition, McGraw Hill, 2003.
3. S.K.Singh, "Database Systems Concepts, Design and Applications", First Edition, Pearson Education, 2006.

PTCS 9201 DESIGN AND ANALYSIS OF ALGORITHMS **L T P C**
3 0 0 3

AIM:

- The aim is to introduce the basics of algorithm design paradigms and analysis to enable designing of efficient algorithms.

OBJECTIVES:

- To introduce the basic concepts of algorithm analysis
- To introduce the design paradigms for algorithm design
- To introduce the basic complexity theory.

UNIT I **9**

The Role of Algorithms in Computing-Getting Started-Growth of Functions – Recurrences-The Substitution Method- The Recurrence Tree Method-The Master Method -Probabilistic Analysis and Randomized Algorithms-The Hiring Problem-Random Variables-Randomized Algorithms.

UNIT II **9**

Quicksort-Description-Performance-Randomized version-Analysis. Sorting in linear time-Lower bounds for sorting-Counting sort-Medians and order statistics-Minimum and maximum-Selection in expected linear time- Selection in worst-case linear time-Dynamic Programming – Matrix chain multiplication –Elements of Dynamic programming- Longest common sequences.

UNIT III **9**

Greedy Algorithms-Activity selection problem-Elements of Greedy Strategy-Huffman code.Matrix Operations-Properties of matrices-Strassen's algorithm-Solving systems of linear equations-Inverting matrices.

UNIT IV **9**

Linear Programming-Standard and slack forms-Formulating problems-Simplex algorithm-Duality-Initial basic feasible solution - String Matching-Naive string matching algorithm-Knuth-Morris-Pratt algorithm.

UNIT V **9**

NP-completeness-Polynomial time-Polynomial-time verification-NP-completeness and reducibility-NP-completeness proofs - NP-completeness problems. Approximation Algorithms-The vertex-cover problem-The traveling-salesman problem.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, Cliford Stein, "Introduction to Algorithms", Second Edition, Prentice Hall of India, 2007.

REFERENCE :

1. Jon Kleinberg, Eva Tardos, "Algorithm Design", Pearson Education, 2006.
2. Michael T. Goodrich, Toberto Tamassisa, " Algorithm Design: Foundations, Analysis and Internet Examples", Wiley Student Edition, 2007.
3. Anany Levitin, "Introduction to Design and Analysis of Algorithms", Pearson Education, 2003.

PTCS 9254 SOFTWARE ENGINEERING **L T P C**
3 0 0 3

AIM:

- The course is intended to give Software Engineering principles in classical sense.

OBJECTIVES:

- To be aware of a member of generic models to structure the software development process.
- To understand fundamental concepts of requirements engineering and requirements specification.
- To understand different notion of complexity at both the module and system level
- To be aware of some widely known design methods.
- To understand the role and contents of testing activities in different life cycle phases.

UNIT I **9**

The Evolving role of Software – Software – The changing Nature of Software – Legacy software —A generic view of process– A layered Technology – A Process Framework – The Capability Maturity Model Integration (CMMI) – Process Assessment – Personal and Team Process Models. Product and Process. Process Models – The Waterfall Model – Incremental Process Models – Incremental Model – The RAD Model – Evolutionary Process Models – Prototyping – The Spiral Model – The Concurrent Development Model – Specialized Process Models – the Unified Process.

UNIT II **9**

Software Engineering Practice – communication Practice – Planning practice Modeling practice– Construction Practice –Deployment. Requirements Engineering - Requirements Engineering tasks – Initiating the requirements Engineering Process-Eliciting Requirements – Developing Use cases – Building the Analysis Models – Elements of the Analysis Model – Analysis pattern – Negotiating Requirements – Validating Requirements.

UNIT III **9**

Requirements Analysis – Analysis Modeling approaches – data modeling concepts – Object oriented Analysis – Scenario based modeling – Flow oriented Modeling – Class based modeling – creating a behaviour model.

UNIT IV **9**

Design Engineering – Design process -Design Quality-Design model-User interface Design – Testing strategies- strategies Issues for conventional and object oriented software-validation testing –system testing –Art of debugging – Project management

UNIT V **9**

Software evolution - Verification and Validation -Critical Systems Validation – Metrics for Process, Project and Product-Quality Management -Process Improvement –Risk Management- Configuration

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Roger S.Pressman, Software Engineering: A Practitioner's Approach, McGraw Hill International edition, Sixth edition, 2005.
2. Ian Sommerville, Software Engineering, 8th Edition, Pearson Education, 2008(unit v)

REFERENCES:

1. Stephan Schach, Software Engineering, Tata McGraw Hill, 2007.
2. Pfleeger and Lawrence Software Engineering: Theory and Practice, Pearson Education, second edition, 2001

PTCS 9205	**DBMS LAB**	**L T P C**
		0 0 3 2

Experiments in the following topics:

1. Data Definition, Manipulation of base tables and views
2. High level programming language extensions.
3. Front end tools
4. Forms
5. Triggers
6. Menu Design
7. Importing/ Exporting Data
8. Reports.
9. Database Design and implementation (Mini Project).

TOTAL: 45 PERIODS

PTCS 9252 OPERATING SYSTEMS L T P C
3 0 0 3

AIM:

- The course introduces the students to the basic principles of operating systems.

OBJECTIVES:

- To be aware of the evolution of operating systems
- To learn what processes are, how processes communicate, how process synchronization is done and how to manage processes
- To have an understanding of the main memory and secondary memory management techniques.
- To understand the I/O Subsystem
- To have an exposure to Linux and Windows 2000 operating systems

UNIT I OPERATING SYSTEMS OVERVIEW 9

Operating system – Types of Computer Systems – Computer-system operation – I/O structure – Hardware Protection – System components – System calls – System programs – System structure – Process concept – Process scheduling – Operations on processes – Cooperating processes – Interprocess communication – Communication in client-server systems – Multithreading models – Threading issues – Pthreads.

UNIT II PROCESS MANAGEMENT 10

Scheduling criteria – Scheduling algorithms – Multiple-processor scheduling – Real time scheduling – Algorithm Evaluation – Process Scheduling Models - The critical-section problem – Synchronization hardware – Semaphores – Classic problems of synchronization – Critical regions – Monitors – System model – Deadlock characterization – Methods for handling deadlocks – Recovery from deadlock

UNIT III STORAGE MANAGEMENT 9

Memory Management – 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 concept – Access methods – Directory structure – File-system mounting – Protection – Directory implementation – Allocation methods – Free-space management – Disk scheduling – Disk management – Swap-space management.

UNIT V CASE STUDY 8

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 PERIODS

TEXT BOOK:

1. Silberschatz, Galvin and Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons Inc 2003.

REFERENCES:

1. Andrew S. Tanenbaum, “Modern Operating Systems”, Second Edition, Addison Wesley, 2001.
2. Gary Nutt, “Operating Systems”, Second Edition, Addison Wesley, 2003.
3. H M Deital, P J Deital and D R Choffnes, “Operating Systems”, Pearson Education, 2004.

PTCS 9253 WEB TECHNOLOGY L T P C
3 0 0 3

AIM:

- To provide an introduction to Java and basic Web concepts and enable the student to create simple Web based applications.

OBJECTIVES:

- To introduce the features of object oriented programming languages using Java
- To design and create user interfaces using Java frames and applets
- To have a basic idea about network programming using Java
- To create simple Web pages and provide client side validation
- To create dynamic web pages using server side scripting

UNIT I **9**

Java fundamentals – Class, Object – Inheritance – Polymorphism – Packages – Interfaces – Exception handling

UNIT II **9**

I/O – AWT – Event handling – Introduction to Threads - Basics of Networking –TCP and UDP sockets – Connecting to the Web

UNIT III **9**

Applets – JDBC – Swings – Remote Method Invocation

UNIT IV **9**

World Wide Web – HTML – List –Tables – Frames – Forms – HTTP commands – XML – DTD, Schema – XSLT – XML Parser – Client side scripting

UNIT V **9**

Server side scripting – JSP – Servlets – Session management – Cookies

TOTAL: 45 PERIODS

TEXTBOOKS:

1. Deitel and Deitel, "Java – How to program", 3rd ed., Pearson Education, 2001.
2. Robert W. Sebesta, "Programming the World Wide Web", 3rd ed.,Pearson Education, 2006. (Units 4,5)

REFERENCES :

1. Herbert Schildt, "Java – The Complete Reference", 7th ed., Tata McGraw Hill, 2007.
2. Chris Bates, "Web Programming", 3rd ed., Wiley, 2006.
3. Black Book, "Java 6 Programming", Dreamtech Press, 2007.
4. Deitel, "Java How to Program", Pearson Education, 2003.
5. W Clay Richardson, et al, "Professional Java JDK 6 Edition", Wrox, 2007.

PTIT 9303 COMPUTER NETWORKS **L T P C**
3 0 0 3

AIM :

- To understands the concepts of computer networks

OBJECTIVES:

- To understand the layering concepts in computer networks
- To understand the functions of each layer
- To have knowledge in different applications that use computer networks

UNIT I **7**

Network architecture – Layers – Physical links – Channel access on links – SDMA – TDMA – FDMA – CDMA – Hybrid multiple access techniques - Issues in the data link layer - Framing – Error correction and detection – Link-level flow control

UNIT II **7**

Medium access – Ethernet – Token ring – FDDI – Wireless LAN – Bridges and Switches

UNIT III **11**

Circuit switching – Packet switching – Virtual circuit switching – IP – ARP – RARP – DHCP – ICMP – Routing algorithms – RIP – OSPF – Subnetting – CIDR – Interdomain routing – BGP – IPv6 – Multicasting – Congestion avoidance in network layer

UNIT IV **10**

UDP – TCP – Flow control – Congestion control – Queueing discipline – Congestion avoidance – QoS – RPC

UNIT V **10**

Email (SMTP, MIME, POP3, IMAP) – HTTP – DNS- SNMP – Telnet – FTP – TFTP

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”, Fourth Edition, Morgan Kaufmann Publishers Inc., 2007.
2. James F. Kurose, Keith W. Ross, “Computer Networking, A Top-Down Approach Featuring the Internet”, Third Edition, Addison Wesley, 2005.

REFERENCES:

1. Nader F. Mir, “Computer and Communication Networks”, First Edition, Pearson Education, 2007
2. Douglas E. Comer, “Computer Networks and Internets with Internet Applications”, Fourth Edition, Pearson Education, 2003.
3. Andrew S. Tanenbaum, “Computer Networks”, Fourth Edition, Pearson Education, 2002.
4. William Stallings, “Data and Computer Communication”, Eighth Edition, Pearson Education, 2007.

PTIT 9252 EMBEDDED SYSTEMS L T P C
3 0 0 3

AIM :

- To understand hardware and the software aspects of embedded systems.

OBJECTIVES:

- To understand the architecture of embedded processors, microcontrollers, and peripheral devices.
- To appreciate the nuances of programming micro-controllers in assembly for embedded systems.
- To understand the challenges in developing operating systems for embedded systems.
- To learn about programming these systems in high-level languages such as C.

UNIT I EMBEDDED COMPUTING 9

Challenges of Embedded Systems – Embedded system design process. Embedded processors – 8051 Microcontroller, ARM processor – Architecture, Instruction sets and programming.

UNIT II MEMORY AND INPUT / OUTPUT MANAGEMENT 9

Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupt handling.

UNITIII PROCESSES AND OPERATING SYSTEMS 9

Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Performance issues.

UNIT IV EMBEDDED C PROGRAMMING 9

Programming embedded systems in C – C-looping structures – Register allocation – Function calls – Pointer aliasing – structure arrangement – bit fields – unaligned data and endianness – inline functions and inline assembly – portability issues.

UNIT V EMBEDDED SYSTEM DEVELOPMENT 9

Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design issues – Design methodologies – Case studies – Complete design of example embedded systems.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Wayne Wolf, “Computers as Components:Principles of Embedded Computer System Design”, Elsevier, 2006.
2. Muhammed Ali Mazidi, Janice Gillispie Mazidi and Rolin D. McKinlay, “The 8051 Microcontroller and Embedded Systems”, Pearson Education, Second edition, 2007 (unit 1)
3. .Andrew N Sloss, D. Symes, C. Wright, ” Arm system developers guide”, Morgan Kauffman/ Elsevier, 2006. (unit 4)

REFERENCES:

1. Michael J. Pont, “Embedded C”, Pearson Education , 2007.
2. Steve Heath, “Embedded System Design” , Elsevier, 2005.

PTCS 9256 WEB TECHNOLOGY LOBORATORY L T P C
0 0 3 2

AIM:

- To enable the students to program in Java and to create simple Web based applications.

OBJECTIVES:

- To write simple programs using Java
- To design and create user interfaces using Java frames and applets
- To write I/O and network related programs using Java
- To create simple Web pages and provide client side validation
- To create dynamic web pages using server side scripting

EXPERIMENTS IN THE FOLLOWING:

1. Java Fundamentals, Classes, Objects
2. Inheritance, Polymorphism
3. Interfaces, Exception handling
4. I/O, AWT
5. Socket Programming
6. Applets, Swings
7. Database connectivity
8. RMI
9. XML, Style sheet, Parser
10. Client side scripting
11. JSP, Servlets
12. Session Management

TOTAL: 45 PERIODS

PTIT 9301 SOFTWARE PROJECT MANAGEMENT L T P C
3 0 0 3

AIM:

- This course aims at the role of software developers in getting exposure on planning and controlling aspect of software development

OBJECTIVES:

- To understand the roles of the project manager
- To understand the threats and opportunities in project management
- To gain Expertise in size, effort and cost estimation techniques
- To understand the techniques available with which a project's aims and objectives, timetable, activities, resources and risks can be kept under control
- To understand the social and political problems a project will encounter--against which the technical problems pale into insignificance--and to begin to understand how to approach non-technical problems
- To Appreciate of other management issues like team structure, group dynamics
- To understand communication

UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT 9

Project Definition – Contract Management – Activities Covered by Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II PROJECT EVALUATION 9

Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation. – software effort estimation

UNIT III ACTIVITY PLANNING 9

Objectives – Project Schedule – Sequencing and Scheduling Activities – Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning and Control.

UNIT IV MONITORING AND CONTROL 9

Resource allocation - identifying and scheduling resources – publishing resource and cost schedule – scheduling sequence - Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Priortizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance.

UNITV MANAGING PEOPLE AND ORGANIZING TEAMS 9

Introduction – Understanding Behavior – Organizational Behaviour - Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team – Decision Making – Leadership – Organizational Structures – Stress – Health And Safety – Case Studies.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Bob Hughes, Mikecotterell, “Software Project Management”, Third Edition,Tata McGraw Hill, 2004.

REFERENCES:

1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Royce, “Software Project Management”, Pearson Education, 1999.
3. Jalote, “Software Project Management in Practice”, Pearson Education, 2002.
4. Robert T. Futrell, Donald F. Shefer and Linda I. Shefer, “Quality Software Project Management”, Pearson Education, 2003.

PTCS 9027 DATA WAREHOUSING AND MINING L T P C
3 0 0 3

AIM:

- To serve as an introductory course to under graduate students with an emphasis on the design aspects of Data Mining and Data Warehousing

OBJECTIVES:

This course has been designed with the following objectives:

- To introduce the concept of data mining with in detail coverage of basic tasks, metrics, issues, and implication. Core topics like classification, clustering and association rules are exhaustively dealt with.
- To introduce the concept of data warehousing with special emphasis on architecture and design.

UNIT I DATA WAREHOUSING 10

Data warehousing Components –Building a Data warehouse –- Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata.

UNIT II BUSINESS ANALYSIS 8

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools – OLAP Tools and the Internet.

UNIT III DATA MINING 8

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues –Data Preprocessing.

UNIT IV ASSOCIATION RULE MINING AND CLASSIFICATION 11

Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining Various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Backpropagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods - Prediction

UNITV CLUSTERING AND APPLICATIONS AND TRENDS IN DATA MINING 8

Cluster Analysis - Types of Data – Categorization of Major Clustering Methods - K-means – Partitioning Methods – Hierarchical Methods - Density-Based Methods –Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data - Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Alex Berson and Stephen J. Smith, " Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Second Edition, Elsevier, 2007.

REFERENCES:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, " Introduction To Data Mining", Person Education, 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay ", Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta, " Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
4. Soumendra Mohanty, "Data Warehousing Design, Development and Best Practices", Tata McGraw – Hill Edition, 2006.

PTIT 9304 DISTRIBUTED SYSTEMS L T P C
3 0 0 3

AIM:

The aim of the course is to convey an insight into the fundamental concepts, principles, and state-of-the-art practice underlying the design of distributed systems.

OBJECTIVES:

- To understand the importance of communication in distributed environment and the actual implementation of various communication mechanisms
- To study how a distributed operating system works and how it differs from the single processor OS.
- To learn how to manage the resources in a distributed environment
- To learn how to make a distributed systems fault tolerant
- To study how the above-mentioned techniques have been used in actual, real-life distributed systems.

UNIT I COMMUNICATION IN DISTRIBUTED ENVIRONMENT 8

Introduction – Various Paradigms in Distributed Applications – Remote Procedure Call – Remote Object Invocation – Message-Oriented Communication – Unicasting, Multicasting and Broadcasting – Group Communication.

UNIT II DISTRIBUTED OPERATING SYSTEMS 12

Issues in Distributed Operating System – Threads in Distributed Systems – Clock Synchronization – Causal Ordering – Global States – Election Algorithms –Distributed Mutual Exclusion – Distributed Transactions – Distributed Deadlock – Agreement Protocols .

UNIT III DISTRIBUTED RESOURCE MANAGEMENT 10

Distributed Shared Memory – Data-Centric Consistency Models – Client-Centric Consistency Models – Ivy – Munin – Distributed Scheduling – Distributed File Systems – Sun NFS.

UNIT IV FAULT TOLERANCE AND CONSENSUS 7

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+ – Distributed Coordination-Based System – JINI.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. George Coulouris, Jean Dollimore, Tim Kindberg, “Distributed Systems Concepts and Design”, Third Edition, Pearson Education Asia, 2002.
2. Hagit Attiya and Jennifer Welch, “Distributed Computing: Fundamentals, Simulations and Advanced Topics”, Wiley, 2004.

REFERENCES:

1. Mukesh Singhal, “Advanced Concepts In Operating Systems”, McGrawHill Series in Computer Science, 1994.
2. A.S.Tanenbaum, M.Van Steen, “Distributed Systems”, Pearson Education, 2004.
3. M.L.Liu, “Distributed Computing Principles and Applications”, Pearson Addison Wesley, 2004.

PTCS 9306 CASE TOOLS LAB L T P C
0 0 3 2

AIM:

- Scope of this lab is to understand the application of case tools, which focuses on the following software engineering activities:

OBJECTIVES:

- Software requirements analysis and specification
- Software design
- Software implementation
- Software testing and maintenance
- Communication skills and teamwork
- Modeling techniques and CASE tools
- Software project planning and management

1. Study of case tools such as rational rose or equivalent tools

2. **Requirements**
   Implementation of requirements engineering activities such as elicitation, validation, management using case tools

4. **Analysis and design**
   Implementation of analysis and design using case tools.

5. Study and usage of software project management tools such cost estimates and scheduling

6. Documentation generators - Study and practice of Documentation generators.

7. Data modeling using automated tools.

8. Practice reverse engineering and re engineering using tools.

9. Exposure towards test plan generators, test case generators, test coverage and software metrics.

10. Meta modeling and software life cycle management.

TOTAL: 45 PERIODS

PTIT 9351 SERVICE ORIENTED ARCHITECTURE **L T P C**
3 0 0 3

AIM:

- To provide an overview of Service Oriented Architecture and enable the student to create applications in a collaborative environment.

OBJECTIVES:

- To study the importance of Service Oriented Architecture.
- Implementation of SOA in the Java and .NET frameworks.
- To study the advanced features of SOA.

UNIT I **9**

Introduction – Service Oriented Enterprise – Service Oriented Architecture (SOA) – SOA and Web Services – Multi-Channel Access – Business Process management – Extended Web Services Specifications – Overview of SOA – Concepts – Key Service Characteristics – Technical Benefits – Business Benefits

UNIT II **9**

SOA and Web Services – Web Services Platform – Service Contracts – Service-Level Data Model – Service Discovery – Service-Level Security – Service-Level Interaction patterns – Atomic Services and Composite Services – Proxies and Skeletons – Communication – Integration Overview – XML and Web Services - .NET and J2EE Interoperability – Service-Enabling Legacy Systems – Enterprise Service Bus Pattern

UNIT III **9**

Multi-Channel Access – Business Benefits – SOA for Multi Channel Access – Tiers – Business Process Management – Concepts – BPM, SOA and Web Services – WS-BPEL – Web Services Composition

UNIT IV **9**

Java Web Services – JAX APIs – JAXP – JAX-RPC – JAXM – JAXR – JAXB

UNIT V **9**

Metadata Management – Web Services Security – Advanced Messaging – Transaction Management

TOTAL: 45 PERIODS

TEXTBOOKS:

1. Eric Newcomer, Greg Lomow, “Understanding SOA with Web Services”, Pearson Education, 2005.
2. James McGovern, Sameer Tyagi, Michael E Stevens, Sunil Mathew, “Java Web Services Architecture”, Elsevier, 2003. (Unit 4)

REFERENCES:

1. Thomas Erl, “Service Oriented Architecture”, Pearson Education, 2005.
2. Frank Cohen, “FastSOA”, Elsevier, 2007.
3. Scott Campbell, Vamsi Mohun, “Mastering Enterprise SOA”, Wiley, 2007.
4. Eric Pulier, Hugh Taylor, “Understanding Enterprise SOA”, Dreamtech Press, 2007.
5. Jeff Davies, “The Definitive Guide to SOA”, Apress, 2007.
6. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services”, Pearson Education, 2004.

PTIT 9352 WIRELESS NETWORKS **L T P C**
3 0 0 3

AIM:

- To introduce the concepts of Wireless Communication to explore the various types of existing Wireless Networks and to learn programming in Wireless environment.

OBJECTIVES:

- To understand the concepts of Wireless Communication
- To discuss the features of IEEE 802.11 Wireless LANS
- To learn the various types of cellular telephone systems
- To explain the role of TCP/IP in Mobile networks
- To understand the WAP framework

UNIT I WIRELESS COMMUNICATION 7

Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation - MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks

UNIT II WIRELESS LAN 9

IEEE 802.11 Standards – Architecture – Services – Mobile Ad hoc Networks- WiFi and WiMAX - Wireless Local Loop

UNIT III MOBILE COMMUNICATION SYSTEMS 11

GSM-architecture-Location tracking and call setup- Mobility management- Handover-Security-GSM SMS –International roaming for GSM- call recording functions-subscriber and service data mgt –-Mobile Number portability -VoIP service for Mobile Networks – GPRS –Architecture-GPRS procedures-attach and detach procedures-PDP context procedure-combined RA/LA update procedures-Billing

UNIT IV MOBILE NETWORK AND TRANSPORT LAYERS 9

Mobile IP – Dynamic Host Configuration Protocol-Mobile Ad Hoc Routing Protocols– Multicast routing-TCP over Wireless Networks – Indirect TCP – Snooping TCP – Mobile TCP – Fast Retransmit / Fast Recovery – Transmission/Timeout Freezing-Selective Retransmission – Transaction Oriented TCP- TCP over 2.5 / 3G wireless Networks

UNIT V APPLICATION LAYER 9

WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile- caching model-wireless bearers for WAP - WML – WMLScripts - WTA - iMode- SyncML

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2003.
2. William Stallings, “Wireless Communications and Networks”, Pearson Education, 2002.

REFERENCES:

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

PTIT 9354 **GRID COMPUTING** **L T P C**
3 0 0 3

AIM:

- To understand the latest advances in the field of computation to optimize the utilization of resources.

OBJECTIVES:

- To enable resource sharing across networks.
- To integrate heterogeneous computing systems and data
- Resources with the aim of providing a global computing Space.
- To manage and schedule the resources in grid environments.
- To know the standards and protocols used.
- To Know the middleware in grid computing.

UNIT I CONCEPTS AND ARCHITECTURE 9

Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing-Anatomy and Physiology of Grid-Review of Web Services-OGSA-WSRF.

UNIT II GRID MONITORING 9

Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- GridICE – JAMM -MDS-Network Weather Service-R-GMA-Other Monitoring Systems- Ganglia and GridMon

UNIT III GRID SECURITY AND RESOURCE MANAGEMENT 9

Grid Security-A Brief Security Primer-PKI-X509 Certificates-Grid Security-Grid Scheduling and Resource Management-Scheduling Paradigms- Working principles of Scheduling -A Review of Condor, SGE, PBS and LSF-Grid Scheduling with QoS**.**

UNIT IV DATA MANAGEMENT AND GRID PORTALS 9

Data Management-Categories and Origins of Structured Data-Data Management Challenges-Architectural Approaches-Collective Data Management Services-Federation Services-Grid Portals-First-Generation Grid Portals-Second-Generation Grid Portals.

UNIT V GRID MIDDLEWARE 9

List of globally available grid Middlewares - Case Studies-Current version of Globus Toolkit and gLite - Architecture, Components and Features.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Maozhen Li, Mark Baker, The Grid: Core Technologies, John Wiley & Sons ,2005.

REFERENCES:

1. Foster & Carl Kesselman, The Grid 2 – Blueprint for a New Computing Infrastructure , Morgan Kaufman – 2004.
2. Joshy Joseph & Craig Fellenstein, Grid Computing, Pearson Education 2004.
3. Fran Berman, Geoffrey Fox, Anthony J.G.Hey, Grid Computing: Making the Global Infrastructure a Reality", John Wiley and Sons, 2003
4. URLs : www.globus.org and glite.web.cern.ch (Unit V)

PTCS 9356 FREE AND OPEN SOURCE SOFTWARE LABORATORY LTP C
0 0 3 2

AIM:

- The student will get exposure to operating system and networking concepts at source code level.

OBJECTIVES:

- To learn the setting up gnu/Linux-based servers and workstation
- To learn shell programming
- To learn to configure application and server software
- To learn to perform system administration tasks
- To learn to use free and open source components.

1. GNU/Linux OS installation (provide details of how to detect hardware, configure disk partitions & filesystems and successfully install a GNU/Linux distribution)

2. Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management

3. User and group management, file ownerships and permissions, PAM authentication, Introduction to common system configuration files & log files

4. Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, ethernet, leased line)

5. Configuring additional hardware - sound cards, displays & display cards, network cards, modems, usb drives, CD writers

6. Performing every day tasks using GNU/Linux - accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs

7. Setting up email servers - using postfix (for SMTP services), courier (for IMAP & POP3 services), squirrelmail (for webmail services)

8. Setting up web servers - using Apache (for HTTP services), Setting up proxy services, printer services, firewall

9. Using the GNU Compiler Collection - getting acquainted with the the GNU compiler tools - the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), and the assembler (gas)

10. Understanding build systems - constructing makefiles and using make, using autoconf and autogen to automatically generate makefiles tailored for different development environments, Using flex (lex) and bison (yacc) to design parsers

TOTAL: 45 PERIODS

PTIT 9401 SOFTWARE TESTING **L T P C**
3 0 0 3

AIM:

- The course looks at the role of developers in areas such as test planning, implementation, and defect tracking. It explains how to review and manage test requirements and how to incorporate testing into the software development life cycle.

OBJECTIVES:

- To determine software testing objectives and criteria
- To develop and validate a test plan
- To select and prepare test cases
- To identify the need for testing
- To prepare testing policies and standards
- To use testing aids and tools
- To test before buying a software package
- Test after maintenance and enhancement changes
- To measure the success of testing efforts

UNIT I INTRODUCTION **8**

Testing as an Engineering Activity – Testing as a Process – testing axioms - Basic Definitions – Software Testing Principles – The Tester's Role in a Software Development Organization – Origins of Defects – cost of defects - Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support for Developing a Defect Repository – Defect Prevention Strategies

UNIT II TEST CASE DESIGN **11**

Test Case Design Strategies – Using Black Box Approach to Test Case Design - Random Testing – Requirements based testing – Boundary Value Analysis – Decision tables - Equivalence Class Partitioning - State-based testing – Cause-effect graphing – Error guessing - Compatibility testing – User documentation testing – Domain testing
Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing - Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White–box Based Test Design – code complexity testing – Evaluating Test Adequacy Criteria.

UNIT III LEVELS OF TESTING **9**

The Need for Levels of Testing – Unit Test – Unit Test Planning –Designing the Unit Tests - The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination
System Testing – Acceptance testing – Performance testing - Regression Testing – Internationalization testing – Ad-hoc testing - Alpha , Beta Tests – testing OO systems – Usability and Accessibility testing – Configuration testing - Compatibility testing – Testing the documentation – Website testing

UNIT IV TEST MANAGEMENT **9**

People and organizational issues in testing – organization structures for testing teams – testing services - Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process - Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

UNIT V TEST AUTOMATION 8

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation - Test metrics and measurements –project, progress and productivity metrics

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Srinivasan Desikan and Gopalaswamy Ramesh, " Software Testing – Principles and Practices", Pearson education, 2006.
2. Ilene Burnstein, "Practical Software Testing", Springer International Edition, 2003.

REFERENCES:

1. Ron Patton, " Software Testing", Second Edition, Sams Publishing, Pearson Education, 2007
2. Renu Rajani, Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques", Tata McGraw Hill, 2004.
3. Edward Kit, "Software Testing in the Real World – Improving the Process", Pearson Education, 1995.
4. Boris Beizer, "Software Testing Techniques" – 2nd Edition, Van Nostrand Reinhold, New York, 1990.
5. Aditya P. Mathur, "Foundations of Software Testing – Fundamental algorithms and techniques", Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008

PTIT 9402 CRYPTOGRAPHY AND SECURITY L T P C
3 0 0 3

AIM:

- To introduce the fundamentals of Cryptography and its application to security.

OBJECTIVES:

- To understand the mathematics behind Cryptography
- To understand the standard algorithms used to provide confidentiality provide integrity and authenticity.
- To get a working knowledge of network security, data base security and DS security issues in order to build secure systems.

UNIT I 9

Security trends – Attacks and services – Classical crypto systems – Different types of ciphers – LFSR sequences – Basic Number theory – Congruences – Chinese Remainder theorem – Modular exponentiation – Fermat and Euler's theorem – Legendre and Jacobi symbols – Finite fields – continued fractions.

UNIT II 9

Simple DES – Differential cryptoanalysis – DES – Modes of operation – Triple DES – AES – RC5, RC4 – RSA – Attacks – Primality test – factoring.

UNIT III 9

Discrete Logarithms – Computing discrete logs – Diffie-Hellman key exchange – Elliptic curve cryptography Key exchange - ElGamal Public key cryptosystems – Message Authentication codes - Hash functions – Hash algorithms - Secure Hash – Birthday attacks - MD5 – Authentication protocols - Digital signatures – RSA, ElGamal, DSA.

UNIT IV **9**

Authentication applications – Kerberos, X.509, PKI – Electronic Mail security – PGP, S/MIME – IP security – Web Security – SSL, TLS, SET – system security.

UNIT V **9**

Trusted Operating systems – security models – designing trusted OS – assurance – Data base security – multi-level databases – multi-level security.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Wade Trappe, Lawrence C Washington, " Introduction to Cryptography with coding theory", 2nd ed, Pearson, 2007.
2. William Stallings, "Crpyptography and Network security Principles and Practices", Pearson/PHI, 4th ed, 2006.
3. PFleeger and Pfleeger, "Security in computing", 3rd ed, PHI/Pearson, 2003.

REFERENCE :

1. Wenbo Mao, "Modern Cryptography Theory and Practice", Pearson 2004.

PTCS 9351 DIGITAL SIGNAL PROCESSING **L T P C**
3 0 0 3

AIM:

- To give an understanding on the study that deals with the representation of signals as ordered sequences of numbers and how to process those ordered sequences.

OBJECTIVES:

- To understand the basics of signals and system by analyzing the various transformations available and determine their use to DSP
- To study on the various digital filtering techniques and how to apply to DSP
- To study on the ways to estimate signal parameters, and transform a signal into a form that is more informative.
- To give students a flavour on the applications of DSP in the areas of speech and image

UNIT I SIGNALS AND SYSTEMS **9**

Basic elements of DSP – concepts of frequency in Analog and Digital Signals – sampling theorem – Discrete – time signals, systems – Analysis of discrete time LTI systems – Z transform – Convolution (linear and circular) – Correlation.

UNIT II FREQUENCY TRANSFORMATIONS **9**

Introduction to DFT – Properties of DFT – Filtering methods based on DFT – FFT Algorithms - Decimation – in – time Algorithms, Decimation – in – frequency Algorithms – Use of FFT in Linear Filtering – DCT.

UNIT III IIR FILTER DESIGN **9**

Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (HPF, BPF, BRF) filter design using frequency translation

UNIT IV FIR FILTER DESIGN 9

Structures of FIR – Linear phase FIR filter – Filter design using windowing techniques, Frequency sampling techniques – Finite word length effects in digital Filters

UNIT V APPLICATIONS 9

Multirate signal processing – Speech compression – Adaptive filter – Musical sound processing – Image enhancement.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. John G. Proakis & Dimitris G.Manolakis, "Digital Signal Processing – principles,
2. Algorithms & Applications", Fourth edition, Pearson education / Prentice Hall, 2007.
3. Emmanuel C..Ifeachor, & Barrie.W.Jervis, "Digital Signal Processing", Second edition, Pearson Education / Prentice Hall, 2002.

REFERENCE BOOKS:

1. Sanjit K. Mitra, "Digital Signal Processing – A Computer Based Approach" ,Tata McGraw Hill, Fourth Edition, 2007 .
2. Alan V.Oppenheim, Ronald W. Jchafer & Hohn. R.Back, "Discrete Time Signal Processing", Pearson Education, Second Edition, 2001.
3. Andreas Antoniou, "Digital Signal Processing", Tata McGraw Hill.

PTCS 9022 INTERNET PROGRAMMING L T P C
3 0 0 3

AIM:

- To provide an overview of 3-tier architecture and enable the student to create enterprise applications.

OBJECTIVES:

- To introduce the feature of the J2EE framework and the usage of MVC architecture.
- To design and create user interfaces using JSP.
- To write the business logic for the middle tier.
- To provide transaction and security support for enterprise applications.
- To study the features of other frameworks.

UNIT I 9

Introduction – 3 tier architecture – working with model-view-controller – JCP – J2EE XML based APIs – Application servers

UNIT II 9

Presentation tier and EIS tier – servlet programming – JSP – Java Mail – JMS – Java transactions – JNDI – Java authentication and authorization services – Java cryptography (9)

UNIT III 9

Service Tier and Data tier – EJB architecture – session beans – entity beans – message driven beans – JDBC – J2EE connector architecture

UNIT IV **9**

Web Services – J2EE Web Services – patterns – presentation, service tier and Data tier patterns – J2ME

UNIT V

AJAX - Struts – JSF – Hibernate – Spring **9**

TOTAL: 45 PERIODS

TEXT BOOKS:

1. McGovern et al, "J2EE 1.4 Bible", Wiley India, 2007.
2. Black Book, "Java Server Programming", Dreamtech Press, 2007. (Unit V)

REFERENCES :

1. Cay S Horstmann, Gary Cornell, "Core Java 2" Vol II, 7th ed, Pearson Education, 2005.
2. W Clay Richardson, et al, "Professional Java JDK 6 Edition", Wrox, 2007

PTCS 9024 ADVANCED DATABASE TECHNOLOGY **L T P C**
3 0 0 3

AIM:

- Advanced database aims at providing an understanding of the principles used in the design of different kinds of data models. It is also deals with the Transaction management of these different databases.

OBJECTIVES:

- To understand about different data models that can be used for specialized applications
- To make the students to get familiarized with transaction management of advanced database models
- To develop in-depth knowledge about web and intelligent database systems.
- To provide an introductory concept about the way in which data can be stored in multimedia databases.

UNIT I RELATIONAL MODEL ISSUES **9**

ER Model - Normalization – Query Processing – Query Optimization - Transaction Processing - Concurrency Control – Recovery - Database Tuning.

UNIT II DISTRIBUTED DATABASES **9**

Parallel Databases – Inter and Intra Query Parallelism – Distributed Database Features – Distributed Database Architecture – Fragmentation – Distributed Query Processing – Distributed Transactions Processing **–** Concurrency Control – Recovery – Commit Protocols.

UNIT III OBJECT ORIENTED DATABASES **9**

Introduction to Object Oriented Data Bases - Approaches – Modeling and Design - Persistence – Query Languages - Transaction - Concurrency – Multi Version Locks – Recovery – POSTGRES – JASMINE –GEMSTONE - ODMG Model.

UNIT IV EMERGING SYSTEMS **9**

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

UNIT V CURRENT ISSUES **9**

Rules - Knowledge Bases - Active and Deductive Databases - Multimedia Databases– Multimedia Data Structures – Multimedia Query languages - Spatial Databases.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Thomas Connolly and Carlolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education 2003.

REFERENCES:

1. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Fifth Edition, Pearson Education, 2006.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", Fifth Edition, Tata McGraw Hill, 2006.
3. C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.

PTCS 9023 UNIX INTERNALS **L T P C**
3 0 0 3

AIM:

- To understand about the file system, system calls, process, memory Management and I/O in UNIX.

OBJECTIVES:

- To introduce the architecture of the Unix Operating System.
- To understand the buffer structure
- To introduce Inodes
- To know what is super block
- To cover various system calls
- To study system boot and the Init process
- To introduce process states
- To introduce signals
- To understand memory management
- To study IPC mechanisms

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– 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 PERIODS

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.
3. Uresh Vahalia, "Unix Internals: The New Frontiers", Pearson Education, 1996.

PTIT 9021 VISUAL PROGRAMMING L T P C
3 0 0 3

AIM:

- To introduce windows programming and to cover visual C++ in detail.

OBJECTIVES:

- To introduce event driven programming
- To develop and display a window
- To illustrate the working of message loop
- To introduce window messages
- To illustrate the data types
- To program using Bitmaps
- To develop dialog based applications
- To use static controls
- To use dynamic controls
- To understand document view architecture
- To understand modal and modeless dialogs
- To develop DLL.

UNIT I 8

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 - An Introduction to GDI – Device context- Text output- Scroll Bars – Keyboard – Mouse – Menus.

UNIT II 10

Visual C++ components – Introduction to Microsoft Foundation Classes Library – Getting started with AppWizard – Class Wizard – Event handling – Keyboard and Mouse events - Graphics Device Interface, Colors, Fonts, Pen, Brush, Single and Multiple document

interface - Reading and Writing documents – WM – SIZE, WM-CHAR messages. Resources – Bitmaps creation, usage of BMP and displaying a file existing as a BMP.

UNIT III **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 , CtabControl - Dynamic controls – slider control , progress control. Inheriting CTreeView – CricheditView

UNIT IV **9**

Document view Architecture, Serialization - Multithreading. Menus – Keyboard Accelerators – Tool bars – Tool tip - property sheet. Modal Dialog, Modeless Dialog - CColorDialog, CfileDialog

UNIT V **9**

Status bars – 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, Exception handling and MFC debugging support.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Charles Petzold, "Programming Windows", Microsoft press, 1998.
2. David Kruglinski.J, "Programming Microsoft Visual C++", Fifth Edition, Microsoft press, 1998.

REFERENCES:

1. Steve Holzner, "Visual C++ 6 programming", Wiley Dreamtech India PVt. Ltd., 2003.
2. Kate Gregory "Microsoft Visual C++ .Net", Que, 2003.
3. Herbert Schildt , " MFC programming from the GroundUp" , Second Edition, Osborne/Tata McGraw – Hill, 1998.
4. Pappar and Murray, "Visual C++: The Complete Reference", Tata McGraw – Hill, 2000

PTCS 9029 .NET AND C# PROGRAMMING **L T P C**
3 0 0 3

AIM:

- To provide an introduction to the .NET framework and enable the student to program in C#.

OBJECTIVES:

- To study basic and advanced features of the C# language
- To create form based and web based applications
- To study the internals of the .NET framework

UNIT I **9**

C# and the .NET framework – C# basics – Objects and types – Inheritance – Arrays – Operators and casts – Indexers

UNIT II **9**

Delegates and events – Strings and regular expressions – Generics – Collections – Memory management and pointers – Errors and exceptions

UNIT III **9**

Tracing and events - threading and synchronization - .Net security – localization – Manipulating XML - Managing the file system – basic network programming

UNIT IV **9**

Window based applications – Data access with .NET – basics of ASP .NET - Introduction to web services

UNIT V **9**

Architecture – Assemblies – shared assemblies – CLR hosting – Appdomains – Reflection

TOTAL: 45 PERIODS

TEXTBOOK:

1. Christian Nagel et al. "Professional C# 2005 with .NET 3.0", Wiley India, 2007

REFERENCES:

1. Jesse Liberty, "Programming C#", O'Reilly, 2001.
2. Andrew Troelson, "Pro C# with .NET 3.0", Apress, 2007.
3. Kevin Hoffman, "Visual C# 2005", Pearson Education, 2006.
4. S. Thamarai Selvi, R. Murugesan, "A Text Book on C#", Pearson Education, 2003.

PTIT 9022 COMPUTATIONAL LINGUISTICS **L T P C**
3 0 0 3

AIM:

- The aim of this course is to understand the issues and challenges in tackling natural language and the use of statistical approaches in this challenging area.

OBJECTIVES:

- To study the features of natural languages including Indian Languages
- To grasp Morphology and Parts-of-Speech and its processing
- To understand Probabilistic Models for language processing
- To comprehend the models for Syntax analysis
- To understand Semantics and Pragmatics of natural language

UNIT I INTRODUCTION **9**

Issues – Motivation – Theory of Language -Features of Indian Languages – Issues in Font – Coding Techniques – sorting & searching issues.

UNIT II MORPHOLOGY AND PARTS-OF-SPEECH **9**

Phonology – Computational Phonology - Words and Morphemes – Segmentation – Categorization and Lemmatisation – Word Form Recognition – Valency - Agreement - Regular Expressions and Automata – Morphology- Morphological issues of Indian Languages – Transliteration.

UNIT III PROBABILISTIC MODELS **9**

Probabilistic Models of Pronunciation and Spelling – Weighted Automata – N- Grams – Corpus Analysis – Smoothing – Entropy - Parts-of-Speech – Taggers – Rule based models – Hidden Markov Models – Speech Recognition

UNIT IV SYNTAX 9

Basic Concepts of Syntax – Parsing Techniques – General Grammar rules for Indian Languages – Context Free Grammar – Parsing with Context Free Grammars – Top Down Parser – Earley Algorithm – Features and Unification - Lexicalised and Probabilistic Parsing.

UNIT V SEMANTICS AND PRAGMATICS: 9

Representing Meaning – Computational Representation – Meaning Structure of Language – Semantic Analysis – Lexical Semantics – WordNet – Pragmatics – Discourse – Reference Resolution – Text Coherence – Dialogue Conversational Agents.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Daniel Jurafskey and James H. Martin "Speech and Language Processing", Prentice Hall, 2000.
2. Ronald Hausser "Foundations of Computational Linguistics", Springer-Verleg, 1999.

REFERENCES:

1. James Allen "Natural Language Understanding", Benjamin/Cummings Publishing Co. 1995.
2. Steve Young and Gerrit Bloothooft "Corpus – Based Methods in Language and Speech Processing", Kluwer Academic Publishers, 1997.

PTIT 9023 ARTIFICIAL INTELLIGENCE L T P C
3 0 0 3

AIM

- The aim of this course is to provide an introduction to some basic issues and algorithms in artificial intelligence (AI). The course also provides an overview of intelligent agent design, where agents perceive their environment and act rationally to fulfill their goals. The course approaches AI from an algorithmic, computer science-centric perspective.

OBJECTIVES

- To be familiar with the history of AI, philosophical debates, and be able to discuss the potential and limitations of the subject in its current form.
- To identify the kind of problems that can be solved using AI techniques; to know the relation between AI and other areas of computer science
- To have knowledge of generic problem-solving methods in AI.
- To understand the basic techniques of knowledge representation and their use.
- To know what the basic components of an intelligent agent are, and how this relates to other advanced subjects such as information retrieval, database systems, computer vision, robotics, human-computer interaction, reactive systems etc.
- To be able to implement basic decision making algorithms, including search-based problem solving techniques, and first-order logic.
- To know the basic issues in machine learning, and be able to apply straightforward techniques to learn from observed data.
- To be able to explain the difficulty of computer perception with examples from different modalities, and be able to show how perception affects intelligent systems design.

UNIT I INTRODUCTION 9

Intelligent Agents –Environments – Behavior – Structure – Artificial Intelligence – Present and Future - Problem Solving –agents – examples– uninformed search strategies – Avoiding repeated states – searching with partial information.

UNIT II SEARCHING TECHNIQUES 9

Informed search strategies –greedy – best first – A* - local search algorithms and optimization – local search in continuous spaces **–** Constraint satisfaction problems (CSP) – Backtracking search and Local search – Structure **–** Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision games – elements of chance –

UNIT III KNOWLEDGE REPRESENTATION AND REASONING 9

Logical Agents – Wumpus world - Propositional logic - First order logic - syntax and semantics – Using first order logic – Inference – forward chaining – backward chaining**–** Knowledge representation **–** Ontological Engineering **–** Categories and objects – Actions **–** Simulation and events **–** Mental events and mental objects.

Reasoning with Default Information – Truth Maintenance Systems – Reasoning with Uncertain Information – Axioms of Probability – Independence – Bayes' Rule and it's use

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 - Reinforcement learning – Passive reinforcement learning **–** Active reinforcement learning **–** Generalization in reinforcement learning.

UNIT V APPLICATIONS 9

Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation - Perception – image Formation – Image Processing – Object Recognition – Robotics – Robotic Perception – Planning –Moving –Robotic Software Architecture.

TOTAL: 45 PERIODS

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. George F. Luger, "Artificial Intelligence-Structures and Strategies for Complex Problem Solving", Pearson Education, 2002.

PTIT 9024 DIGITAL IMAGE PROCESSING **L T P C**
3 0 0 3

AIM:

- The aim is to inculcate a basic training in the processing of images for practical applications in the domain of medical, remoting sessions and in general.

OBJECTIVES:

- To introduce basic concepts in acquiring, storage and Process of images
- To introduce for enhancing the quality of images.
- To introduce techniques for extraction and processing of region of interest
- To introduce case studies of Image Processing.

UNIT I FUNDAMENTALS OF IMAGE PROCESSING 9

Introduction – Steps in Image Processing Systems – Image Acquisition – Sampling and Quantization – Pixel Relationships – Colour Fundamentals and Models, File Formats, Image operations – Arithmetic, Geometric and Morphological.

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UNIT II IMAGE ENHANCEMENT 9

Spatial Domain Gray level Transformations Histogram Processing Spatial Filtering – Smoothing and Sharpening. Frequency Domain: Filtering in Frequency Domain – DFT, FFT, DCT – Smoothing and Sharpening filters – Homomorphic Filtering.

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UNIT III IMAGE SEGMENTATION AND FEATURE ANALYSIS 9

Detection of Discontinuities – Edge Operators – Edge Linking and Boundary Detection – Thresholding – Region Based Segmentation – Morphological WaterSheds – Motion Segmentation, Feature Analysis and Extraction.

UNIT IV MULTI RESOLUTION ANALYSIS AND COMPRESSIONS 9

Multi Resolution Analysis : Image Pyramids – Multi resolution expansion – Wavelet Transforms.Image Compression : Fundamentals – Models – Elements of Information Theory – Error Free Compression – Lossy Compression – Compression Standards.

UNIT V APPLICATIONS OF IMAGE PROCESSING 9

Image Classification – Image Recognition – Image Understanding – Video Motion Analysis – Image Fusion – Steganography – Digital Compositing – Mosaics – Colour Image Processing..

TOTAL: 45 PERIODS

TEXT BOOK :

1. Rafael C.Gonzalez and Richard E.Woods, “Digital Image Processing” Second Edition, Pearson Education, 2003.

REFERENCES:

1. Milan Sonka, Vaclav Hlavac and Roger Boyle, “Image Processing, Analysis and Machine Vision”, Second Edition, Thomson Learning, 2001
2. Anil K.Jain, “Fundamentals of Digital Image Processing”, PHI, 2006.
3. Sanjit K. Mitra, & Giovanni L. Sicuranza, “Non Linear Image Processing”, Elsevier, 2007.
4. Richard O. Duda, Peter E. HOF, David G. Stork, “Pattern Classification” Wiley Student Edition, 2006.

PTCS 9032 **GRAPH THEORY** **L T P C**
3 0 0 3

AIM:

- Knowledge of basic Graph Theory and development of skills in problem solving.

OBJECTIVES:

- Acquiring knowledge of the basic tools in Graph Theory. Some advanced topics including some algorithms.

UNIT I INTRODUCTION 9

Graphs – Introduction – Isomorphism – Sub graphs – Walks, Paths, Circuits – Connectedness – Components – Euler Graphs – Hamiltonian Paths and Circuits – Trees – Properties of trees – Distance and Centers in Tree – Rooted and Binary Trees.

UNIT II TREES,CONNECTIVITY,PLANARITY 9

Spanning trees – Fundamental Circuits – Spanning Trees in a Weighted Graph – Cut Sets – Properties of Cut Set – All Cut Sets – Fundamental Circuits and Cut Sets – Connectivity and Separability – Network flows – 1-Isomorphism – 2-Isomorphism – Combinational and Geometric Graphs – Planer Graphs – Different Representation of a Planer Graph.

UNIT III MATRICES,COLOURING AND DIRECTED GRAPH 9

Incidence matrix – Submatrices – Circuit Matrix – Path Matrix – Adjacency Matrix – Chromatic Number – Chromatic partitioning – Chromatic polynomial – Matching – Covering – Four Color Problem – Directed Graphs – Types of Directed Graphs – Digraphs and Binary Relations – Directed Paths and Connectedness – Euler Graphs – Adjacency Matrix of a Digraph.

UNIT IV ALGORITHMS 9

Algorithms: Connectedness and Components – Spanning tree – Finding all Spanning Trees of a Graph – Set of Fundamental Circuits – Cut Vertices and Separability – Directed Circuits.

UNIT V ALGORITHMS 9

Algorithms: Shortest Path Algorithm – DFS – Planarity Testing – Isomorphism.

TOTAL: 45 PERIODS

TEXT BOOKS:

Narsingh Deo, “Graph Theory: With Application to Engineering and Computer Science”, Prentice Hall of India, 2003.

REFERENCES:

1. R.J. Wilson, “Introduction to Graph Theory”, Fourth Edition, Pearson Education, 2003.

PTCS 9035 FREE/OPEN SOURCE SOFTWARE L T P C
3 0 0 3

AIM:

- To understand the FOSS Philosophy and use a Linux distribution to learn installation, administration and programming in this environment

OBJECTIVES:

- To impart a first hand knowledge on the FOSS philosophy and methodology
- To enable the students to install and use Linux distribution
- To train the students in Linux desktop usage and some commonly used programs
- To encourage students to apply OSS philosophy and migrate to FOSS in their own domains
- To develop application programs using FOSS
-

UNIT I HISTORY AND OVERVIEW OF GNU/LINUX AND FOSS 3

Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential—global and Indian.

UNIT II SYSTEM ADMINISTRATION 10

GNU/Linux OS installation--detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution ; Basic shell commands -logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ; Introduction to common system configuration files & log files ; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line) ; Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process ; Performing every day tasks using gnu/Linux --accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Window system configuration and utilities--configure X windows, detect display devices ; Installing software from source code as well as using binary packages

UNIT III SERVER SETUP AND CONFIGURATION 10

Setting up email servers--using postfix (SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services) ; Setting up web servers --using apache (HTTP services), php (server-side scripting), perl (CGI support) ; Setting up file services --using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux / Unix networks) ; Setting up proxy services --using squid (http / ftp / https proxy services) ; Setting up printer services -using CUPS (print spooler), foomatic (printer database) ; Setting up a firewall -Using netfilter and iptables

UNIT IV PROGRAMMING TOOLS 12

Using the GNU Compiler Collection --GNU compiler tools ; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems --constructing make files and using make, using autoconf and autogen to

automatically generate make files tailored for different development environments ; Using source code versioning and management tools --using cvs to manage source code revisions, patch & diff ; Understanding the GNU Libc libraries and linker -linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools --gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practicies and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed & awk scripting

UNIT V APPLICATION PROGRAMMING 10

Basics of the X Windows server architecture ; Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localisation support.

TOTAL: 45 PERIODS

REFERENCES:

1. N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005.
2. Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002.
3. Carla Schroder, Linux Cookbook, First Edition, O'Reilly Cookbooks Series, 2004.

ON-LINE MATERIAL

Open Sources: Voices from the Open Source Revolution, First Edition, January 1999, ISBN: 1-56592-582-3. URL: http://www.oreilly.com/catalog/opensources/book/toc.html The Linux Cookbook: Tips and Techniques for Everyday Use, First Edition, Michael Stutz, 2001. URL: http://dsl.org/cookbook/cookbook_toc.html The Linux System Administrators' Guide, Lars Wirzenius, Joanna Oja, Stephen Stafford, and Alex Weeks, December 2003. URL: http://www.tldp.org/guides.html Using GCC, Richard Stallman et al. URL: http://www.gnu.org/doc/using.htmlAn Introduction to GCC, Brian Gough. URL: http://www.network- theory.co.uk/docs/gccintro/GNU Autoconf, Automake and Libtool, Gary V. Vaughan, Ben Elliston, Tom Tromey and Ian Lance Taylor. URL: http://sources.redhat.com/autobook/ Open Source Development with CVS, Third Edition, Karl Fogel and Moshe Bar. URL: http://cvsbook.red-bean.com/Advanced Bash Scripting Guide, Mendel Cooper, June 2005. URL: http://www.tldp.org/guides.htmlGTK+/GNOME Application Development, Havoc Pennington. URL: http://developer.gnome.org/doc/GGAD Python Tutorial, Guido van Rossum, Fred L. Drake, Jr., Editor. URL: http://www.python.org/doc/current/tut/tut.html

PTCS9075 SOFTWARE AGENTS L T P C
3 0 0 3

UNIT I AGENTS – OVERVIEW 9

Agent Definition – Agent Programming Paradigms – Agent Vs Object – Aglet – Mobile Agents – Agent Frameworks – Agent Reasoning.

UNIT II JAVA AGENTS 9

Processes – Threads- FIPA – ACL – DIA GAL– Daemons – Components – Java Beans – ActiveX – Sockets – RPCs – Distributed Computing – Aglets Programming – Jini Architecture – Actors and Agents – Typed and proactive messages.

UNIT III MULTIAGENT SYSTEMS 9

Reasoning about Multi agent Interaction between agents – Reactive English Agents Dutch – Combinational Spectrum – Cognitive Agents – Interaction protocols – Agent coordination – Agent negotiation – Agent Cooperation – Agent Organization – Self-Interested agents in Electronic Commerce Applications – Probabilistic Agents – Temporal Agents.

UNIT IV INTELLIGENT SOFTWARE AGENTS 9

Interface Agents – Agent Communication Languages – Agent Knowledge Representation – Agent Adaptability – Belief Desire Intension – Mobile Agent Applications- Argumentaic and Knowledge Sharing Agent.

UNIT V AGENTS AND SECURITY 9

Agent Security Issues – Mobile Agents Security – Protecting Agents against Malicious Hosts – Untrusted Agent – Black Box Security – Authentication for agents – Security issues for Aglets.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Bigus & Bigus, " Constructing Intelligent agents with Java ", Wiley, 1997.
2. Bradshaw, " Software Agents ", MIT Press, 2000.

REFERENCES:

1. Russel, Norvig, "Artificial Intelligence: A Modern Approach", Second Edition, Pearson Education, 2003.
2. Richard Murch, Tony Johnson, "Intelligent Software Agents", Prentice Hall, 2000.
3. Gerhard Weiss, “Multi Agent Systems – A Modern Approach to Distributed Artificial I Intelligence”, MIT Press, 2000.
4. “Holewgenous Agent Systems”, by V.S. Subramanian, P. Bonathi , J.Dix, T.Eila, MIT Press –ISBN: 0262194368

PTCS 9048 ADHOC AND SENSOR NETWORKS L T P C
3 0 0 3

AIM:

- To provide a strong foundation in wireless adhoc networks and specialized adhoc networks like most networks and sensor networks.

OBJECTIVES:

- To understand the issues of MAC layer and routing protocols
- To study about the different types of adhoc routing protocols
- To learn about the QoS aware adhoc routing protocols
- To study about power and energy management in adhoc networks
- To understand the routing and models of mesh networks.
- To study about the architecture and protocols of wireless sensor networks

UNIT I ROUTING 9

Cellular and Ad hoc wireless networks – Issues of MAC layer and Routing – Proactive, Reactive and Hybrid Routing protocols – Multicast Routing – Tree based and Mesh based protocols – Multicast with Quality of Service Provision

UNIT II QUALITY OF SERVICE 9

Real-time traffic support – Issues and challenges in providing QoS – Classification of QoS Solutions – MAC layer classifications – QoS Aware Routing Protocols – Ticket based and Predictive location based Qos Routing Protocols

UNIT III ENERGY MANAGEMENT AD HOC NETWORKS 9

Need for Energy Management – Classification of Energy Management Schemes – Battery Management and Transmission Power Management Schemes – Network Layer and Data Link Layer Solutions – System power Management schemes

UNIT IV MESH NETWORKS 9

Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – Opportunistic Routing – Self Configuration and Auto Configuration - Capacity Models – Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks

UNIT V SENSOR NETWORKS 9

Introduction – Sensor Network architecture – Data Dissemination – Data Gathering – MAC Protocols for sensor Networks – Location discovery – Quality of Sensor Networks – Evolving Standards – Other Issues – Recent trends in Infrastructure less Networks

TOTAL :45 PERIODS

TEXT BOOK:

1. C. Siva Ram Murthy and B.S.Manoj, “Ad hoc Wireless Networks – Architectures and Protocols’, Pearson Education, 2004

REFERENCES:

1. Feng Zhao and Leonidas Guibas, “Wireless Sensor Networks”, Morgan Kaufman
2. Publishers, 2004.
3. C.K.Toh, “Adhoc Mobile Wireless Networks”, Pearson Education, 2002.
4. Thomas Krag and Sebastin Buettrich, ‘Wireless Mesh Networking’, O’Reilly Publishers, 2007.

PTIT9025 ROUTERS AND NETWORK PROCESSORS L T P C
3 0 0 3

AIM :

- To understand the internals of a router and get an experience of designing such systems.

OBJECTIVES :

- To learn the functions of a router, and its architecture.
- To learn about Network processors – their architecture, programming issues, and design issues.

UNIT I ROUTING IN IP NETWORKS 9

Static Routes – Dynamic Routes – RIP v1, RIP v2 – IGRP – EIGRP – SPF – Integrated IS-IS – IP Traffic engineering – Traffic, Stochasticity, Delay and Utilization – Application view – Architecture Framework – EGP, BGP routing.

UNIT II ROUTER ARCHITECTURE 9

Function of Router – Types – Elements – Packet flow – Packet Processing - Algorithms And Data Structures (packet buffer allocation, etc) - Packet processing functions (Bridge Algorithm, Table Lookup And Hashing, etc)- Protocol Software (threads, Interrupts, etc) - Hardware Architectures For Protocol Processing - Classification And Forwarding – Switching Fabrics.

UNIT III NETWORK PROCESSORS 9

Scalability With Parallelism And Pipelining - Complexity Of Network Processor Design (packet processing, ingress & egress processing, Macroscopic Data Pipelining And Heterogeneity etc) - Network Processor Architectures : architectural variety, Primary architectural characteristics, Packet Flow, Clock Rates, software architecture, Assigning Functionality To The Processor Hierarchy.

UNIT IV NP ARCHITECTURES 9

Issues In Scaling A Network Processor (processing hierarchy and scaling)– examples of commercial Network Processors : Multi-Chip Pipeline, Augmented RISC Processor, Embedded Processor Plus Coprocessors, etc. - Design Tradeoffs and consequences (Programmability Vs. Processing Speed , speed vs functionality. etc).

UNIT V CASE STUDY – NP ARCHITECTURE AND PROGRAMMING 9

Intel NP - Multithreaded Architecture Overview – Basic Features, ExternalConnections, Internal components – Embedded RISC processor (instruction set, internal peripheral unit, User And Kernel Mode Operation) -Packet Processor Hardware (microsequencing, instruction set, etc) – memory interfaces – system and control interface components Bus interface -Software Development Kit – IXP instruction set – MicroEngine Programming - thread synchronization – developing sample applications.

TOTAL: 45 PERIODS

TEXTBOOKS:

1. Douglas E. Comer ”Network System Design using Network Processors” Prentice Hall, 2006.
2. Deepankar Medhi, Karthikeyan Ramasamy, “Network Routing : Algorithms, Protocols, and Architecture”, Elsevier, 2007.

REFERENCES:

1. Patrick Crowley, M A Franklin, H Hadimioglu, PZ Onufryk, “Network Processor Design, Issues and Practices Vol - I”, Morgan Kauffman,2002.
2. http://www.npforum.org/
3. http://www.intel.com/design/network/products/npfamily/

PTIT 9026 TCP/IP DESIGN AND IMPLEMENTATION L T P C
3 0 0 3

AIM:

- To study about the internetworking concepts and functionalities of TCP and IP software and to design data structures for implementing those functionalities.

OBJECTIVES:

- To understand the IP addressing schemes which provides the base for Layer 2 and Layer 3 header field detection, error reporting and dynamic address mapping.
- To develop data structures for basic protocol functions of TCP/IP and to understand and use the various members in the respective structures.
- To design and implement data structures for maintaining multiple local and global timers that will govern over various modules of TCP and IP software.

UNIT I INTRODUCTION 9

Internetworking concepts and architecture model – classful Internet address – CIDR – Subnetting and Supernetting – AARP – RARP- IP- IP Routing – ICMP – IPV6.

UNIT II TCP 9

Services – header – connection establishment and termination – interactive data flow – bulk 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 – comparision – 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.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Douglas E Comer,"Internetworking with TCP/IP Principles,Protocols and Architecture",Vol 1 V edition 2006 and Vol 2, III Edition, 1999.
2. W.Richard Stevens "TCP/IP Illustrated" Vol 1. Pearson Education, 2003.

REFERENCES:

1. Forouzan, " TCP/IP Protocol Suite" Second Edition, Tata MC Graw Hill, 2003.
2. W.Richard Stevens "TCP/IP Illustrated" Volume 2, Pearson Education 2003

PTIT 9027 SOFTWARE METRICS L T P C
3 0 0 3

AIM :

- To provide some fundamental concepts in Software measurement and Metrics.

LEARNING OBJECTIVE:

- To be aware of Core metrics for product, quality, process
- To familiarize with the concepts of Software quality and tools for quality metrics
- To learn more about software reliability
- To understand important concepts of complexity metrics and OO metrics

UNIT I **9**

IT Organization – the need for Metrics – Interpreting the Metrics – Managing the data – Acquiring IT Metrics Information – Limitations – Analysis of Old Data Vs New Data – Graphical Analysis – Core of Software Planning – Measuring Core Metrics (Product, Quality, Process Productivity) Work Output Measurements.

UNIT II **9**

Software Development Process Models – Clean Room Methodology – Defect Prevention Process – Software Productivity Research Assessment- Malcolm Bridge Assessment – ISO 9000 – Software Quality Metrics – Defect Density – Customer Satisfaction Metrics – In Process Quality Metrics.

UNIT III **9**

Metrics for Software Maintenance – Ishikawa's seven basic tools – Their Use in Software Development – Defect Removal Effectiveness – Quality Planning – Cost Effectiveness of Phase Defect Removal – Quality Management Models – Rayleigh Model – Reliability Growth Model.

UNIT IV **9**

Process Metrics for Software Testing – Test Progress Scurve Testing Defect Arrivals, backup, Overtime – CPU Utilization during test – Possible Metrics for Acceptance - Testing to Evaluate.

UNIT V **9**

Complexity Metrics and Models – Lines of Code – Halstead Software Metrics – Cyclomatic Complexity – Syntactic Constructs – Structure Metrics – OO Metrics – CK OO Metric Suit – Productivity Metrics – Quality and Quality Management Metrics.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Stephen H. Kan, "Metrics and Models in Software Quality Engineering", First Edition, Pearson Education, 2003.
2. IT Measurement – A Practical Advice from the Experts", International Function Point Users Group, Pearson Education, Asia, 2002 (Unit I).

PTGE9021 PROFESSIONAL ETHICS IN ENGINEERING **L T P C**
3 0 0 3

UNIT I ENGINEERING ETHICS **9**

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional Ideals and Virtues – Uses of Ethical Theories

UNIT II ENGINEERING AS SOCIAL EXPERIMENTATION **9**

Engineering as Experimentation – Engineers as responsible Experimenters – Research Ethics - Codes of Ethics – Industrial Standards - A Balanced Outlook on Law – The Challenger Case Study

UNIT III ENGINEER'S RESPONSIBILITY FOR SAFETY **9**

Safety and Risk – Assessment of Safety and Risk – Riysis – Reducing Risk – The Government Regulator's Approach to Risk - Chernobyl Case Studies and Bhopal

UNIT IV RESPONSIBILITIES AND RIGHTS **9**

Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) - Discrimination

UNIT V GLOBAL ISSUES **9**

Multinational Corporations – Business Ethics - Environmental Ethics – Computer Ethics - Role in Technological Development – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Honesty – Moral Leadership – Sample Code of Conduct

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill, New York (2005).
2. Charles E Harris, Michael S Pritchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Thompson Learning, (2000).

REFERENCES:

1. Charles D Fleddermann, "Engineering Ethics", Prentice Hall, New Mexico, (1999).
2. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, (2003)
3. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, (2001)
4. Prof. (Col) P S Bajaj and Dr. Raj Agrawal, "Business Ethics – An Indian Perspective", Biztantra, New Delhi, (2004)
5. David Ermann and Michele S Shauf, "Computers, Ethics and Society", Oxford University Press, (2003)

PTGE9022 TOTAL QUALITY MANAGEMENT **L T P C**
3 0 0 3

UNIT I INTRODUCTION **9**

Introduction - Need for quality - Evolution of quality - Definition of quality - Dimensions of manufacturing and service quality - Basic concepts of TQM - Definition of TQM – TQM Framework - Contributions of Deming, Juran and Crosby – Barriers to TQM.

UNIT II TQM PRINCIPLES **9**

Leadership – Strategic quality planning, Quality statements - Customer focus Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement – PDSA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

UNIT III TQM TOOLS & TECHNIQUES I **9**

The seven traditional tools of quality – New management tools – Six-sigma: Concepts, methodology, applications to manufacturing, service sector including IT – Bench marking – Reason to bench mark, Bench marking process – FMEA – Stages, Types.

UNIT IV TQM TOOLS & TECHNIQUES II **9**

Quality circles – Quality Function Deployment (QFD) – Taguchi quality loss function – TPM – Concepts, improvement needs – Cost of Quality – Performance measures.

UNIT V QUALITY SYSTEMS **9**

Need for ISO 9000- ISO 9000-2000 Quality System – Elements, Documentation, Quality auditing- QS 9000 – ISO 14000 – Concepts, Requirements and Benefits – Case studies of TQM implementation in manufacturing and service sectors including IT.

TOTAL : 45 PERIODS

TEXT BOOK

1. Dale H.Besterfiled, et at., “Total Quality Management”, Pearson Education Asia, Third Edition, Indian Reprint (2006).

REFERENCE BOOKS

1. James R. Evans and William M. Lindsay, “The Management and Control of Quality”, 6th Edition, South-Western (Thomson Learning), 2005.
2. Oakland, J.S. “TQM – Text with Cases”, Butterworth – Heinemann Ltd., Oxford, 3rd Edition, 2003.
3. Suganthi,L and Anand Samuel, “Total Quality Management”, Prentice Hall (India) Pvt. Ltd.,2006.
4. Janakiraman,B and Gopal, R.K, “Total Quality Management – Text and Cases”, Prentice Hall (India) Pvt. Ltd., 2006.

PTGE9023 FUNDAMENTALS OF NANOSCIENCE **L T P C**
3 0 0 3

UNIT I INTRODUCTION **10**

Nanoscale Science and Technology- Implications for Physics, Chemistry, Biology and Engineering-Classifications of nanostructured materials- nano particles- quantum dots, nanowires-ultra-thinfilms-multilayered materials. Length Scales involved and effect on properties: Mechanical, Electronic, Optical, Magnetic and Thermal properties. Introduction to properties and motivation for study (qualitative only).

UNIT II PREPARATION METHODS **10**

Bottom-up Synthesis-Top-down Approach: Precipitation, Mechanical Milling, Colloidal routes, Self-assembly, Vapour phase deposition, MOCVD, Sputtering, Evaporation, Molecular Beam Epitaxy, Atomic Layer Epitaxy, MOMBE.

UNIT III PATTERNING AND LITHOGRAPHY FOR NANOSCALE DEVICES **5**

Introduction to optical/UV electron beam and X-ray Lithography systems and processes, Wet etching, dry (Plasma /reactive ion) etching, Etch resists-dip pen lithography

UNIT IV PREPARATION ENVIRONMENTS **10**

Clean rooms: specifications and design, air and water purity, requirements for particular processes, Vibration free environments: Services and facilities required. Working practices, sample cleaning, Chemical purification, chemical and biological contamination, Safety issues, flammable and toxic hazards, biohazards.

UNIT V CHARECTERISATION TECHNIQUES **10**

X-ray diffraction technique, Scanning Electron Microscopy - environmental techniques, Transmission Electron Microscopy including high-resolution imaging, Surface Analysis techniques- AFM, SPM, STM, SNOM, ESCA, SIMS-Nanoindentation

TOTAL: 45 PERIODS

TEXT BOOKS:

1. A.S. Edelstein and R.C. Cammearata, eds., “Nanomaterials: Synthesis, Properties and Applications”, Institute of Physics Publishing, Bristol and Philadelphia, 1996.
2. N John Dinardo, “Nanoscale charecterisation of surfaces & Interfaces”, 2nd Edition, Weinheim Cambridge, Wiley-VCH, 2000

REFERENCES:

1. G Timp (Editor), “Nanotechnology”, AIP press/Springer, 1999
2. Akhlesh Lakhtakia (Editor), “The Hand Book of Nano Technology,Nanometer Structure”, Theory, Modeling and Simulations”, Prentice-Hall of India (P) Ltd, New Delhi, 2007.

PTIT9028 USER INTERFACE DESIGN L T P C
3 0 0 3

AIM:

- To understand that User Interface Design is as important as Functionality Design to study the basic principles User-Centered Design

OBJECTIVES:

- To study the basic characteristics of graphics and web interfaces
- To study the basics of Human Computer Interaction
- To study the basics of WIMP interfaces
- To study the multimedia interfaces for the web
- To study the principles of evaluating interfaces

UNIT I INTRODUCTION 8

Human–Computer Interface – Characteristics Of Graphics Interface –Direct Manipulation Graphical System – Web User Interface –Popularity –Characteristic & Principles.

UNIT II HUMAN COMPUTER INTERACTION 7

User Interface Design Process – Obstacles –Usability –Human Characteristics In Design – Human Interaction Speed –Business Functions –Requirement Analysis – Direct – Indirect Methods – Basic Business Functions – Design Standards – General Design Principles – Conceptual Model Design – Conceptual Model Mock-Ups

UNIT III WINDOWS 12

Characteristics– Components– Presentation Styles– Types– Managements– Organizations– Operations– Web Systems– System Timings - Device– Based Controls Characteristics– Screen – Based Controls — Human Consideration In Screen Design – Structures Of Menus – Functions Of Menus– Contents Of Menu– Formatting – Phrasing The Menu – Selecting Menu Choice– Navigating Menus– Graphical Menus. Operate Control – Text Boxes– Selection Control– Combination Control– Custom Control– Presentation Control.

UNIT IV MULTIMEDIA 9

Text For Web Pages – Effective Feedback– Guidance & Assistance– Internationalization– Accessibility– Icons– Image– Multimedia – Coloring.

UNIT V EVALUATION 9

Conceptual Model Evaluation – Design Standards Evaluation – Detailed User Interface Design Evaluation

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Wilbent. O. Galitz ,“The Essential Guide To User Interface Design”, John Wiley& Sons, 2001.
2. Deborah Mayhew, The Usability Engineering Lifecycle, Morgan Kaufmann, 1999 (UNIT II and V)

REFERENCES:

1. Ben Sheiderman, “Design The User Interface”, Pearson Education, 1998.
2. Alan Cooper, “The Essential Of User Interface Design”, Wiley – Dream Tech Ltd., 2002.
3. Sharp, Rogers, Preece, ‘Interaction Design’, Wiley India Edition, 2007

PTIT9029 SOFTWARE QUALITY ASSURANCE L T P C
3 0 0 3

AIM:

- To learn the importance of Software Quality Assurance.

OBJECTIVES:

- To study the concepts of Software Quality Assurance
- To learn about Managing Software Quality
- To study and learn how to apply Software Quality Assurance metrics and analysis techniques
- To study Software Quality Program and Planning
- To get acquainted with Software Quality Assurance Standardization

UNIT I FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE 9

The Role of SQA – SQA Plan – SQA considerations – SQA people – Quality Management – Software Configuration Management

UNIT II MANAGING SOFTWARE QUALITY 9

Managing Software Organizations – Managing Software Quality – Defect Prevention – Software Quality Assurance Management

UNIT III SOFTWARE QUALITY ASSURANCE METRICS 9

Software Quality – Total Quality Management (TQM) – Quality Metrics – Software Quality Metrics Analysis

UNIT IV SOFTWARE QUALITY PROGRAM 9

Software Quality Program Concepts – Establishment of a Software Quality Program – Software Quality Assurance Planning – An Overview – Purpose & Scope.

UNIT V SOFTWARE QUALITY ASSURANCE STANDARDIZATION 9

Software Standards–ISO 9000 Quality System Standards - Capability Maturity Model and the Role of SQA in Software Development Maturity – SEI CMM Level 5 – Comparison of ISO 9000 Model with SEI's CMM

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Mordechai Ben-Menachem / Garry S Marliss, "Software Quality", Vikas Publishing House, Pvt, Ltd., New Delhi.(UNIT III to V)
2. Watts S Humphrey, " Managing the Software Process", Pearson Education Inc.(UNIT I and II)

REFERENCES:

1. Gordon G Schulmeyer, "Handbook of Software Quality Assurance", Third Edition, Artech House Publishers 2007
2. Nina S Godbole, "Software Quality Assurance: Principles and Practice", Alpha Science International, Ltd, 2004

PTIT9030 KNOWLEDGE ENGINEERING L T P C
3 0 0 3

UNIT I INTRODUCTION 9

Knowledge Representation and Reasoning – First order Logic – Syntax, Semantics Pragmatics – Expressing Knowledge – Levels of Representation – Knowledge Acquisition and Sharing – Sharing Ontologies – Language Ontologies –Language Patterns – Tools for Knowledge Acquisition

UNIT II RESOLUTION AND REASONING 9

Proportional Case – Handling Variables and Qualifies – Dealing with Intractability – Reasoning with Horn Clauses - Procedural Control of Reasoning – Rules in Production – Description Logic - Issues in Engineering -Vivid Knowledge – Beyond Vivid.

UNIT III REPRESENTATION 9

Object Oriented Representations – Frame Formalism – Structured Descriptions – Meaning and Entailment - Taxonomies and Classification – Inheritance – Networks – Strategies for Defeasible Inheritance – Formal Account of Inheritance Networks.

UNIT IV DEFAULTS, UNCERTAINTY AND EXPRESSIVENESS 9

Defaults – Introduction – Closed World Reasoning – Circumscription – Default Logic Limitations of Logic – Fuzzy Logic – Nonmontonic Logic – Theories and World – Semiotics – Auto epistemic Logic - Vagueness – Uncertainty and Degrees of Belief – Noncategorical Reasoning – Objective and Subjective Probability.

UNIT V ACTIONS AND PLANNING 9

Explanation and Diagnosis – Purpose – Syntax, Semantics of Context – First Order Reasoning – Modal Reasoning in Context – Encapsulating Objects in Context – Agents – Actions – Situational Calculus – Frame Problem – Complex Actions – Planning – Strips – Planning as Reasoning – Hierarchical and Conditional Planning.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Ronald Brachman, Hector Levesque “Knowledge Representation and Reasoning “, The Morgan Kaufmann Series in Artificial Intelligence 2004
2. John F. Sowa, “ Knowledge Representation: Logical, Philosophical, and Computational Foundations”, 2000

REFERENCE:

1. Arthur B. Markman, “Knowledge Representation”, Lawrence Erlbaum Associates,1998

PTCS9043 **MULTI-CORE PROGRAMMING** **L T P C**
3 0 0 3

AIM :

- To learn about the techniques useful for programming parallel architectures in general, and multi-core processors in particular.

OBJECTIVES :

- To realize the difference between programming for serial processors and parallel processors.
- To understand the challenges in parallel and multi-threaded programming.
- To learn about the various parallel programming paradigms, and solutions.

UNIT I INTRODUCTION TO MULTIPROCESSORS AND SCALABILITY ISSUES **9**

Scalable design principles – Principles of processor design – Instruction Level Parallelism, Thread level parallelism. Parallel computer models –- Symmetric and distributed shared memory architectures – Performance Issues – Multi-core Architectures - Software and hardware multithreading – SMT and CMP architectures – Design issues – Case studies – Intel Multi-core architecture – SUN CMP architecture.

UNIT II PARALLEL PROGRAMMING **9**

Fundamental concepts – Designing for threads. Threading and parallel programming constructs – Synchronization – Critical sections – Deadlock. Threading APIs.

UNIT III OPENMP PROGRAMMING **9**

OpenMP – Threading a loop – Thread overheads – Performance issues – Library functions. Solutions to parallel programming problems – Data races, deadlocks and livelocks – Non-blocking algorithms – Memory and cache related issues.

UNIT IV MPI PROGRAMMING **9**

MPI Model – collective communication – data decomposition – communicators and topologies – point-to-point communication – MPI Library.

UNIT V MULTITHREADED APPLICATION DEVELOPMENT **9**

Algorithms, program development and performance tuning.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Shameem Akhter and Jason Roberts, “Multi-core Programming”, Intel Press, 2006.
2. Michael J Quinn, Parallel programming in C with MPI and OpenMP, Tata Mcgraw Hill, 2003.

REFERENCES :

1. John L. Hennessey and David A. Patterson, “ Computer architecture – A quantitative approach”, Morgan Kaufmann/Elsevier Publishers, 4th. edition, 2007.
2. David E. Culler, Jaswinder Pal Singh, “Parallel computing architecture : A hardware/ software approach” , Morgan Kaufmann/Elsevier Publishers, 1999.

PTCS9045 **PROGRAMMING IN .NET** **L T P C**
3 0 0 3

AIM:

- To enable the student to use the advanced features of C# programming in the .NET framework.

OBJECTIVES:

- To study and implement applications using the Presentation Foundation.
- To study the features associated with enterprise services.
- To create distributed applications using Web services and remoting.
- To study the features of the Workflow Foundation
- To introduce the concepts of the Compact Framework.

UNIT I **9**

Windows Presentation Foundation – Overview – Event Handling – Data Binding – Windows Forms Integration – ASP.NET Introduction - ADO.NET and Data Binding – ASP.NET Development - Custom Controls – Master Pages – Site Navigation – Security – Themes – Web Parts - ASP.NET AJAX

UNIT II **9**

Communication – Web Services with ASP.NET – SOAP, WSDL, Web Services - .NET Remoting - .NET Remoting Architecture - .NET Remoting Features – Mobile Web Services

UNIT III **9**

Enterprise Services – Overview – COM+ Application – Message Queuing

UNIT IV **9**

Windows Workflow Foundation – Activities – Custom Activities – Workflows – Workflow Services – Hosting Workflows – Directory Services – Architecture – Administration Tools

UNIT V **9**

. NET Compact Framework – Compact Edition Data Stores – Errors, Testing and Debugging – Optimizing performance – Packaging and Deployment – Networking and Mobile Devices – Security

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Christian Nagel et al. “Professional C# 2005 with .NET 3.0”, Wiley India , 2007
2. Andy Wigley, Daniel Moth, Peter Foot, “Mobile Development Handbook”, Microsoft Press, 2007.

REFERENCES:

1. Andrew Troelson, “Pro C# with .NET 3.0”, Apress, 2007.
2. Kevin Hoffman, “Visual C# 2005”, Pearson Education, 2006.
3. Justin Smith, “Inside Windows Communication Foundation”, Microsoft Press, 2007.

PTIT 9031 NETWORK PROGRAMMING AND MANAGEMENT L T P C
3 0 0 3

AIM:

- To understand the features of network sockets and to learn socket programming.

OBJECTIVES:

- To introduce TCP and UDP Sockets
- To explain the issues in the development of server software
- To discuss routing sockets, raw sockets and other advanced sockets
- To develop standard network applications
- To develop network management utilities in Layer 2 and Layer 3

UNIT I INTRODUCTION 9

Overview of TCP/IP – Client/Server Paradigm – Program Interface to Protocols – Socket Abstraction and Address Structure – Construction of messages – Byte ordering and Address conversion functions – Client software design – Issues in Server Design – I/O Multiplexing – Select and Poll functions – TCP and UDP Sockets

UNIT II CLIENT/SERVER DESIGN 9

Simple Client/Server Applications using TCP and UDP sockets – Echo, Daytime, Time applications – Iterative Servers using TCP and UDP sockets – Process Structure – Concurrent Connection Oriented Servers – Concurrent UDP servers – Multiprotocol and Multiservice servers

UNIT III ADVANCED SOCKETS 9

Routing Sockets – Broadcasting and Multicasting – Advanced UDP sockets – Out of band data – Threads, Threaded servers – Raw Sockets – Signal driven I/O – IPv4 and IPv6 Interoperability – Daemon processes – Advanced I/O functions – Non blocking I/O – Mutexes and Condition variables

UNIT IV APPLICATION DEVELOPMENT 9

Application Level Gateways – Remote Procedure Call – Distributed Program Generation – Network File System – Mail server and client – TELNET – FTP client/server – Web Server – Simple DNS Application

UNIT V NETWORK MANAGEMENT 9

DNS MX client application – Development of Ping Utility – WHOIS query – IP level network tapping – Layer 2 Network Tapping

TOTAL: 45 PERIODS

TEXT BOOKS:

1. W. Richard Stevens, “Unix Network Programming – Vol I”, Second Edition, Pearson Education, 1998.
2. D.E Comer and David L Stevens, “TCP/IP Illustrated – Vol III”, Second Edition, Pearson Education, 1996.

PTIT9032 ENTERPRISE RESOURCE PLANNING L T P C
3 0 0 3

AIM:

- The student understands the basic concepts of Enterprise Resource Planning and its role in improving the business dynamics.

OBJECTIVES:

- To provide an integrated view of various facets of business, including planning, manufacturing, sales, finance and marketing.
- To understand the development of software to integrate business activities such as inventory management and control, order tracking, customer service, finance and human resources.
- To become aware of the software applications and tools that are available to business to use to drive out costs and improve efficiency.
- To understand the paths and pitfalls of the implementation process

UNIT I INTRODUCTION TO ERP 9

Overview – Benefits of ERP – ERP and Related Technologies – Business Process Reengineering – Data Warehousing – Data Mining – On–line Analytical Processing – Supply Chain Management.

UNIT II ERP IMPLEMENTATION 9

Implementation Life Cycle – Implementation Methodology – Hidden Costs – Organizing Implementation – Vendors, Consultants and Users – Contracts – Project Management and Monitoring.

UNIT III BUSINESS MODULES 9

Business Modules in an ERP Package – Finance – Manufacturing – Human Resource – Plant Maintenance – Materials Management – Quality Management – Sales and Distribution.

UNIT IV ERP MARKET 9

ERP Market Place – SAP AG – PeopleSoft – Baan Company – JD Edwards World Solutions Company – Oracle Corporation – QAD – System Software Associates.

UNIT V ERP – PRESENT AND FUTURE 9

Turbo Charge the ERP System – EIA – ERP and E–Commerce – ERP and Internet – Future Directions in ERP.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Alexis Leon, “ERP Demystified”, Tata McGraw Hill, 1999.
2. Joseph A. Brady, Ellen F. Monk, Bret J. Wangner, “Concepts in Enterprise Resource Planning” , Thomson Learning, 2001.

REFERENCES:

1. Vinod Kumar Garg and N.K .Venkata Krishnan, “Enterprise Resource Planning – concepts and Planning”, Prentice Hall, 1998.
2. Jose Antonio Fernandez, “ The SAP R /3 Hand book”, Tata McGraw Hill, 1998.
3. Fu, “SAP BW: A Step by Step Guide”, First Edition, Pearson Education, 2003.

PTIT9033 SOFTWARE DESIGN AND ARCHITECTURE L T P C
3 0 0 3

AIM:

- To provide an overview of Service Oriented Architecture and enable the student to create applications in a collaborative environment.

OBJECTIVES:

- To study the importance of Service Oriented Architecture.
- Implementation of SOA in the Java and .NET frameworks.
- To study the advanced features of SOA.

UNIT I **9**

Nature of design process – Characteristics of design activities, Essential elements of design- Factors affecting design quality - Design Quality models – Design principles – Notion of Software architecture – Simple case studies.

UNIT II **9**

Description of software Architectures – Architectural design space – Scenario based analysis and evaluation – SAAM and ATAM methods - formalizing the architectural styles – Tools for architectural design.

UNIT III **9**

Describing the detailed design – Design representations – rationale for software design methods- Design process – Simple design Practices – Stepwise refinement, Incremental design.

UNIT IV **9**

Structured system analysis and Structured design – Jackson structured Programming and Development.

UNIT V **9**

Object concept – Component based development – Formal approach to design – Design patterns- Design Review.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Hong Zhu, “Software Design Methodology – From principles to Architectural styles”, Elsevier, 2006.
2. Mary Shaw and David Garlan, 'Software Architecture – Perspectives on an emerging Discipline”, PHI, 2003. (UNIT I and II)
3. David Budgen, “Software Design”, Pearson Education, 2004. (UNIT –III to V)
4. Bass, L., Clements P. and Kazman, R., “Software Architecture in Practice, Addison Wesley, 1998.

PTIT9035 **SOFT COMPUTING** **L T P C**
3 0 0 3

AIM:

- To give an overall understanding on the theories that are available to solve hard real-world problems

OBJECTIVES:

- To give the students an overall knowledge of soft computing theories and fundamentals
- To give an understanding on the fundamentals of non-traditional technologies and approaches to solving hard real-world problems
- Fundamentals of artificial neural networks, fuzzy sets and fuzzy logic and genetic algorithms.
- Use of ANN, Fuzzy sets to solve hard real-world problems
- To given an overview of Genetic algorithms and machine learning techniques to solving hard real-world problems
- To study about the applications of these areas

UNIT I INTRODUCTION 9

Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence – Neural Networks - Scope and Evolution – Models of Neural Networks – Feed forward Networks – Supervised Learning Neural Networks – Associative memory networks – Unsupervised learning networks – Special Networks

UNIT II FUZZY SETS AND FUZZY LOGIC 9

Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations - Fuzzy Rules Non – interactive fuzzy sets – Fuzzification– Intuition , inference, Rank ordering – Defuzzification – Max-membership principle, centroid method, center of sums, center of largest area.

UNIT III FUZZY MEASURES AND REASONING 9

Fuzzy arithmetic and measures – Fuzzy reasoning – approximate reasoning – categorical, qualitative, syllogistic, dispositional – Fuzzy inference systems – fuzzy decision making – individual, multiperson, multi objective, Bayesian – fuzzy logic control system – architecture, model and application

UNIT IV MACHINE LEARNING AND GENETIC ALGORITHM 9

Machine Learning Techniques – Machine Learning Using Neural Nets – Genetic Algorithms (GA) – Simple and General GA – Classification of Genetic Algorithm – Messy, Adaptive, Hybrid, Parallel – Holland Classifier System

UNIT V APPLICATION AND IMPLEMENTATION SOFT COMPUTING 9

Genetic algorithms -. Traveling Salesperson Problem, Internet Search Techniques – Fuzzy Controllers – Bayesian Belief networks for Rocket Engine Control - Neural Network, Genetic algorithm and Fuzzy logic implementation in C++ and Matlab

TOTAL: 45 PERIODS

TEXT BOOK:

1. S.N. Sivanandam and S.N. Deepa, “Principles of Soft Computing”, Wiley India Ltd., First Indian Edition, 2007

REFERENCES:
1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji 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 Edn., 2003.
3. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall, 1995.
4. Amit Konar, "Artificial Intelligence and Soft Computing", First Edition,CRC Press, 2000.
5. Simon Haykin, "Neural Networks: A Comprehensive Foundation", Second Edition Prentice Hall, 1999.
6. Mitchell Melanie, "An Introduction to Genetic Algorithm", Prentice Hall, 1998.
7. David E. Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, 1997.

PTCS 9044 BIOINFORMATICS L T P C
3 0 0 3

AIM:

- By using the well-tested and successful approach of problem-based learning, students will learn through applying the strategies and tools used in bioinformatics to topical problems drawn from ongoing research and applications in a variety of fields.

OBJECTIVES:

- To emphasize how to use the computer as a tool for biomedical research.
- To understand the use of Databases and Data mining concepts in the field of biology
- To study and understand the various modeling techniques that are used for modeling biological data
- To explore visualization techniques for DNA and RNA molecules
- To be aware of the microarray technology for genome expression study

UNIT I INTRODUCTION 9

Need for Bioinformatics technologies – Overview of Bioinformatics technologies – Structural bioinformatics – Data format and processing – secondary resources and applications – Role of Structural bioinformatics - Biological Data Integration System.

UNIT II DATAWAREHOUSING AND DATAMINING IN BIOINFORMATICS 9

Bioinformatics data – Datawarehousing architecture – data quality – Biomedical data analysis – DNA data analysis – Protein data analysis – Machine learning – Neural network architecture and applications in bioinformatics

UNIT III MODELING FOR BIOINFORMATICS 9

Hidden markov modeling for biological data analysis – Sequence identification – Sequence classification – multiple alignment generation – Comparative modeling – Protein modeling – genomic modeling – Probabilistic modeling – Bayesian networks – Boolean networks - Molecular modeling – Computer programs for molecular modeling

UNIT IV PATTERN MATCHING AND VISUALIZATION 9

Gene regulation – motif recognition – motif detection – strategies for motif detection – Visualization – Fractal analysis – DNA walk models – one dimension – two dimension – higher dimension – Game representation of Biological sequences – DNA, Protein, Amino acid sequences.

UNIT V MICROARRAY ANALYSIS 9

Microarray technology for genome expression study – image analysis for data extraction – preprocessing – segmentation – gridding – spot extraction – normalization, filtering – cluster analysis – gene network analysis – Compared Evaluation of Scientific Data Management Systems – Cost Matrix – Evaluation model - Benchmark - Tradeoffs

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Yi-Ping Phoebe Chen (Ed), "BioInformatics Technologies", First Indian Reprint, Springer Verlag, 2007.
2. Zoe lacroix and Terence Critchlow, "BioInformatics – Managing Scientific data", First Indian Reprint, Elsevier, 2004

REFERENCES:

1. Zoe Lacroix and Terence Critchlow, "Bioinformatics – Managing Scientific Data", First Edition, Elsevier, 2004
2. Bryan Bergeron, "Bio Informatics Computing", Second Edition, Pearson Education, 2003.
3. Arthur M Lesk, "Introduction to Bioinformatics", Second Edition, Oxford University Press, 2005

PTIT9036 MANAGEMENT INFORMATION SYSTEMS L T P C
3 0 0 3

AIM:

- To understand the design, development and management of information systems.

OBJECTIVES:

- To know the basics of managing the information
- To understand the design, development and maintenance of information systems.
- To understand basic issues in knowledge management and information systems.

UNIT I INFORMATION SYSTEM AND ORGANIZATION 9

Matching the Information System Plan to the Organizational Strategic Plan – Identifying Key Organizational Objective and Processes and Developing an Information System Development – User role in Systems Development Process – Maintainability and Recoverability in System Design.

UNIT II REPRESENTATION AND ANALYSIS OF SYSTEM STRUCTURE 9

Models for Representing Systems: Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) – Information Flow – Process Flow – Methods and

Heuristics – Decomposition and Aggregation – Information Architecture – Application of System Representation to Case Studies.

UNIT III SYSTEMS, INFORMATION AND DECISION THEORY 9

Information Theory – Information Content and Redundancy – Classification and Compression – Summarizing and Filtering – Inferences and Uncertainty – Identifying Information needed to Support Decision Making – Human Factors – Problem characteristics and Information System Capabilities in Decision Making.

UNIT IV INFORMATION SYSTEM APPLICATION 9

Transaction Processing Applications – Basic Accounting Application – Applications for Budgeting and Planning – Other use of Information Technology: Automation – Word Processing – Electronic Mail – Evaluation Remote Conferencing and Graphics – System and Selection – Cost Benefit – Centralized versus Decentralized Allocation Mechanism.

UNIT V DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS 9

Systems analysis and design – System development life cycle – Limitation – End User Development – Managing End Users – off– the shelf software packages – Outsourcing – Comparison of different methodologies.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Laudon K.C, Laudon J.P, Brabston M.E, “Management Information Systems - Managing the digital firm”, Pearon Education, 2004.

REFERENCES:

1. Turban E.F, Potter R.E, “Introduction to Information Technology”; Wiley, 2004.
2. Jeffrey A.Hoffer, Joey F.George, Joseph S. Valachich, “Modern Systems Analysis and Design”, Third Edition, Prentice Hall, 2002.

PTIT9038 COMPUTER GRAPHICS L T P C
3 0 0 3

AIMS:

- Introduce concepts of low level imaging and Graphics primitives
- Introduce students to the theory implementation and application of modern computer graphics techniques
- Introduce application of computer graphics techniques to selected problems in Modeling, Rendering, Interaction and Animation

OBJECTIVES:

- The students will be able to understand all graphics primitives, two dimensional and three dimensional object creation and manipulation techniques
- Students will have clear knowledge about Graphics programming concepts
- Students will gain knowledge on Fractal based objects and Shading, Shadowing and Rendering Techniques.

UNIT I 2D PRIMITIVES 9

Output primitives – Line, Circle and Ellipse drawing algorithms - Attributes of output primitives – Two dimensional Geometric transformation - Two dimensional viewing – Line, Polygon, Curve and Text clipping algorithms

UNIT II 3D CONCEPTS 9

Parallel and Perspective projections - Three dimensional object representation – Polygons, Curved lines, Splines, Quadric Surfaces,- Visualization of data sets - 3D transformations – Viewing -Visible surface identification.

UNIT III GRAPHICS PROGRAMMING 9

Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Raster, Keyframe - Graphics programming using OPENGL – Basic graphics primitives – Drawing three dimensional objects - Drawing three dimensional scenes

UNIT IV RENDERING 9

Introduction to Shading models – Flat and Smooth shading – Adding texture to faces – Adding shadows of objects – Building a camera in a program – Creating shaded objects – Rendering texture – Drawing Shadows.

UNIT V FRACTALS 9

Fractals and Self similarity – Peano curves – Creating image by iterated functions – Mandelbrot sets – Julia Sets – Random Fractals – Overview of Ray Tracing – Intersecting rays with other primitives – Adding Surface texture – Reflections and Transparency – Boolean operations on Objects

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Donald Hearn, M.Pauline Baker, Computer Graphics – C Version, second edition, Pearson Education,2004.
2. F.S. Hill, Computer Graphics using OPENGL, Second edition, Pearson Education,2003.

REFERENCES:

1. James D. Foley, Andries Van Dam, Steven K. Feiner, John F. Hughes, Computer Graphics- Principles and practice, Second Edition in C, Pearson Education, 2007.

PTCS9031 CYBER FORENSICS L T P C
3 0 0 3

AIM:

- To study different types of Cyberforensic technologies and enable the student to have a foundation in this emerging area.

OBJECTIVES:

- To study the fundamentals of computer forensics
- To have an overview of techniques for Data Recovery and Evidence Collection
- To study various threats associated with security and information warfare
- To study the tools and tactics associated with cyberforensics.

UNIT I 9

Computer Forensics Fundamentals – Types of Computer Forensics Technology – Types of Vendor and Computer Forensics Services

UNIT II 9

Data Recovery – Evidence Collection and Data Seizure – Duplication and Preservation of Digital Evidence – Computer Image Verification and Authentication

UNIT III **9**

Discover of Electronic Evidence – Identification of Data – Reconstructing Past Events – Networks

UNIT IV **9**

Fighting against Macro Threats – Information Warfare Arsenal – Tactics of the Military – Tactics of Terrorist and Rogues – Tactics of Private Companies

UNIT V **9**

The Future – Arsenal – Surveillance Tools – Victims and Refugees – Advanced Computer Forensics

TOTAL: 45 PERIODS

TEXTBOOK:

1. John R. Vacca, "Computer Forensics", Firewall Media, 2004.

REFERENCES :

1. Chad Steel, "Windows Forensics", Wiley India, 2006.
2. Majid Yar, "Cybercrime and Society", Sage Publications, 2006.
3. Robert M Slade, "Software Forensics", Tata McGrawHill, 2004.

PTIT9034 BUSINESS PROCESS MODELS **L T P C**
3 0 0 3

AIM:

- To understand the way the dynamics of a business are modeled with processes

OBJECTIVES:

- To understand the internal business processes
- To understand the external business processes
- To study the basics of business process modeling
- To understand the nature of large processes
- To study the methods for managing the process

UNIT I UNDERSTANDING BUSINESS PROCESS **9**

Organizations as Systems, Effective Operations Management, Adding Value, Competing on Capabilities, Value Chain and Competitive Advantage

UNIT II CUSTOMER AND MATERIALS PROCESSING **9**

Marketing in a Changing World, Relationship Marketing, Purchasing, Concept of a Manufacturing System, Logistics and Competitive Strategy, Reverse Logistics, The triumph of Process

UNIT III PROCESS MODELING **9**

Process Modeller's Needs, Basic Concepts in Process Modeling, Modeling with RADS, Animating a Process

UNIT IV LARGE PROCESSES **9**

Micro-Modeling of Processes, Modeling Large Processes, Process Patterns.

UNIT V MANAGING THE MODELING 9

Modeling the Materials in the Process, Analyzing a Process Model, Managing the Modeling.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Davis Barnes (Editor), "Understanding Business : Process", Routledge, USA, 2000 [UNITS 1,2]
2. Martyn A Ould, "Business Processes : Modelling and Analysis for Re-Engineering and Improvement" , John Wiley & Sons, USA, 1995 [UNITS3,4,5]

REFERENCES:

1. Howard Smith and Peter Fingar, "Business Process Management (BPM) : TheThird Wave", Meghan-Kiffer Press, USA, 2003
2. Roger Burlton, "Business Process Management : Profiting from Process",SAMS, USA, 2001
3. Mike Jacka J, Paulette J Keller, "Business Process Mapping : Improving Customer Satisfaction", John Wiley & Sons, USA, 2001
4. Faisal Haque, " e-Enterprise : Business Models, Architecture and Components", Cambridge University Press, UK, 2000.
5. Ulric J Gelinas, Steve G Sutton and Jane Fedorowicz, "Business Processes and Information Technology", Thompson Learning, India, 2004

PTIT 9041 DOMAIN ENGINEERING L T P C
3 0 0 3

AIM:

- To understand the methods and tools for identifying and Representing the commonalities across different domains

OBJECTIVES:

- To study the basic principle of domain analysis and scoping
- To understand some domain engineering methods
- To understand the principles of modeling the features
- To understand the concepts of generative programming
- To study the languages and tools used for domain engineering

UNIT I DOMAIN ANALYSIS AND SCOPING 9

Domain Analysis. Domain Design and Domain Implementation. Application Engineering. Product-Line Practices. Key Domain Engineering Concepts. Domain. Domain Scope and Scoping. Relationships between Domains. Features and Feature Models. Method Tailoring and Specialization. Survey of Domain Analysis and Domain Engineering Methods

UNIT II DOMAIN ENGINEERING METHODS 9

Feature-Oriented Domain Analysis (FODA). FODA Process. Organization Domain Modeling (ODM). The ODM Process. Draco. Capture. Domain Analysis and Reuse Environment (DARE). Domain-Specific Software Architecture (DSSA) Approach, Algebraic Approach. Other Approaches. Domain Engineering and Related Approaches.

UNIT III FEATURE MODELING 9

Feature Modeling. Feature Models. Feature Diagrams. Mandatory Features. Optional Features. Alternative Features. Or-Features. Normalized Feature Diagrams. Expressing

Commonality in Feature Diagrams. Expressing Variability in Feature Diagrams. Other Infon-nation Associated with Feature Diagrams in a Feature Model. Assigning Priorities to Variable Features. Availability Sites, Binding Sites, and Binding Modes. Sites. Availability Sites. Binding Sites and Binding Modes. Relationship between Optimizations and Availability Sites, Binding Sites, and Binding Modes.

UNIT IV GENERATIVE PROGRAMMING 9

Generative Domain Models. Main Development Steps in Generative Programming. dapting Domain Engineering for Generative Programming. Domain-Specific Languages. DEMRAL: Example of a Domain Engineering Method for Generative Programming. Outline of DEMRAL. Domain Analysis. Domain Definition. Domain Modeling. Identification of Key Concepts. Feature Modeling. Feature Starter Set for ADTs. Feature Starter Set for Algorithms. Domain Design. Scope Domain Model for Implementation. Identify Packages.

UNIT V LANGUAGES AND TOOLS 9

Hume, DSL Paradigm, Stratego/XT, Run-time Code Generation in C++.

TOTAL: 45 PERIODS

TEXTBOOKS

1. Czarnecki Krysztof, Eisenecker Ulrich, Generative programming : methods, tools and applications, Lavoisier, 2000.
2. C. Lengauer, Domain- Specific Program Generation, Springer, 2004

PTIT 9352 WIRELESS COMMUNICATIONS L T P C
3 0 0 3

AIM:

- Wireless technology has become the most exciting area in telecommunications and networking. The rapid growth of mobile telephone use, various satellite services, and now the wireless Internet and wireless LANs are generating tremendous changes in telecommunications and networking. The aim is to provide the learner with a basic understanding of the various IMT-2000 based 3rd generation radio and network technologies and their respective deployment and migration options.

OBJECTIVES:

- To introduce the underlying technologies of wireless communication.
- To explain the benefits and limitations of various techniques for providing multiple users access to scarce radio spectrum resources.
- To provide a detailed study of the four generations of wireless cellular and mobile telephony, technologies, applications and other issues.

UNIT I 9

Overview-Principles of CDMA-Radio channel access- Spread Spectrum-Power control-Handovers-Wideband CDMA Air interface- Physical layer-FEC encoding/decoding-Error detection-Frequency and time synchronization- Channels- Spreading and scrambling codes- Diversity.

UNIT II 9

Modulation techniques and spread spectrum- Spreading techniques- Codes- Channel coding – Wideband CDMA air interface- Protocol stack- Media Access Control (MAC)-Radio Link control (RLC)- Radio Resource Control (RRC) – User plane – PDC protocol-Data protocols.

UNIT III **9**

UMTS network structure- Core network- UMTS Radio access network – GSM Radio access network- Interfaces – Network Protocols.New concepts in UMTS Network – Location services-Opportunity driven multiple access – Multimedia Messaging services – Gateway location register – Support of localized service area.

UNIT IV **9**

3G services – Service categories – Tele services Bearer services – Supplementary services – Service capabilities – QoS classes – 3G Applications.Introduction to IMS, Architecture – CSCF – Media gateway – Application Servers – IMS Protocols: SIP, RTP/RTCP and other IMS protocols – IMS Services.

UNIT V **9**

Introduction to 4G networks - DVB-H- Wireless Local Loop (WLL) WLL Architecture, WLL Technologies and frequency spectrum, WLL products, LMDS

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Juha Korhonen, “Introduction to 3G Mobile communications”, Artech House, 2001, (Unit 1,2,3)
2. Miikka Poikselka, Aki Niemi, Hisham Khartabil, Georg Mayer, the IMS: IP Multimedia Concepts and Services, 2nd Edition John Wiley & Sons 2006, (Unit 4)
3. Jeffrey G. Andrews Fundamentals of WiMAX: Understanding Broadband Wireless Networking, Prentice Hall, 2007, (Unit 5)

REFERENCES:

1. Clint Smith, Daniel Collins, Daniel Collins, 3G Wireless Networks, McGraw-Hill Companies, 2006
2. Garg.V.K "IS-95 CDMA and cdma 2000", first Indian reprint 2002, Pearson Education
3. Heikki Kaaranen, Siamäk Naghian, Lauri Laitinen, Ari Ahtiainen , Valtteri Niemi, UMTS Networks: Architecture, Mobility and Services, John Wiley & Sons; 1st edition 2001
4. Frank Ohrtman, WiMAX Handbook, McGraw-Hill Professional; 1 edition 2005

PTIT9040 **MULTIMEDIA NETWORKS** **L T P C**
3 0 0 3

AIM:

- To explain the requirements of a network to support multimedia applications and possible solutions to be included in TCP/IP network.

OBJECTIVES:

- To understand the limitations of TCP/IP networks in the context of multimedia communication
- To study about the various network level solutions
- To study about the various end-to-end solutions
- To learn multimedia Communication in wireless networks
- To study about various multimedia communication standards

UNIT I LIMITATIONS OF TCP/IP NETWORKS 9

Success of the Internet – Best Effort Service model – Advantages and limitations of best Effort Model – Possible enhancements over TCP/IP – Characteristics and Expectations of Multimedia Applications – Quality of Service – Guaranteed Service Model

UNIT II NETWORK LEVEL SOLUTIONS 9

Integrated Services Architecture – Traffic Shaping – Resource Reservation – Admission Control – Differentiated Services Architecture – Per Hop Behavior – ATM Networks – MPLS networks – QoS Aware Routing – Open loop congestion control schemes – Content Distribution Networks – MBONE networks

UNIT III END TO END SOLUTIONS 9

Different Streaming Architectures – RTSP – Functions of a Media Player and Media Server – Forward correction Techniques – RTP and RTCP – Voice over IP – Principles and Applications - H.323 and SIP Standards – XTP Standard

UNIT IV MULTIMEDIA OVER WIRELESS NETWORKS 9

Bandwidth adaptation techniques – Scalable Video Coding for Adaptive Straming applications – Channel Modeling and Wireless Internet – Cross layer Wireless Multimedia – QoS support in Wireless Environment

UNIT V MULTIMEDIA COMMUNICATION STANDARDS 9

Audio/Video Streams – Video Encoding Standards – Speech Encoding Standards – Multimedia multiplexing and Synchronization – Audio/Video Compression Standards

TOTAL: 45 PERIODS

TEXT BOOKS:

1. William Stallings, “High Speed Networks and Internets – Performance and Quality of Service”, Second Edition, Pearson Education, 2002.
2. James F Kurose and Keith W Ross, “Computer Networking: A Top Down Approach Featuring the Internet”, Second Edition, Pearson Education, 2003.

REFERENCES:

1. Fred Halsall, “Multimedia Communications – Applications, Networks, Protocols and Standards”, Pearson Education, 2001.
2. S V Raghavan, Satish K Tripathi, “Networked Multimedia Systems Concepts, Architecture and Design”, Prentice Hall, 1997
3. Ralf Steinmetz, Klara Nahrstedt, “Multimedia Computing, Communications and Applications”, Pearson Education, 1995.