GOVERNMENT COLLEGE OF TECHNOLOGY

(An Autonomous Institution Affiliated to Anna University)

Coimbatore - 641 013

Regulations, Curriculum And Syllabi For

B.TECH. INFORMATION TECHNOLOGY

(Full Time)

2012
Regulations

CURRICULUM FOR CANDIDATES ADMITTED
DURING 2012-2013 AND ONWARDS
FOUR YEAR B.TECH. PROGRAMME
BRANCH : B.TECH. INFORMATION TECHNOLOGY

FIRST SEMESTER

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	L	T	P	C
		THEORY							
1	12I1Z1	COMMUNICATION SKILLS IN ENGLISH-I	25	75	100	3	1	0	4
2	12I1Z2	ENGINEERING MATHEMATICS- I	25	75	100	3	1	0	4
3	12I103	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	25	75	100	4	0	0	4
4	12I104	MATERIALS SCIENCE	25	75	100	3	0	0	3
5	12I105	APPLIED CHEMISTRY	25	75	100	3	0	0	3
6	12I106	PROGRAMMING IN C	25	75	100	3	1	0	4
		PRACTICAL							
7	12I107	WORKSHOP	25	75	100	0	0	3	2
8	12I108	CHEMISTRY LABORATORY	25	75	100	0	0	3	2
9	12I109	C PROGRAMMING LABORATORY	25	75	100	0	0	3	2
		TOTAL			900				28

SECOND SEMESTER

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	L	T	P	C
		THEORY							
1	12I2Z1	COMMUNICATION SKILLS IN ENGLISH - II	25	75	100	3	1	0	4
2	12I2Z2	ENGINEERING MATHEMATICS- II	25	75	100	3	1	0	4
3	12I203	ENGINEERING PHYSICS	25	75	100	3	0	0	3
4	12I204	OBJECT ORIENTED PROGRAMMING USING C++	25	75	100	3	0	0	3
5	12I205	DIGITAL SYSTEMS	25	75	100	3	0	2	4
6	12I206	DATA STRUCTURES AND APPLICATIONS – I	25	75	100	3	1	0	4
		PRACTICAL							
7	12I207	PHYSICS LABORATORY	25	75	100	0	0	3	2
8	12I208	ENGINEERING GRAPHICS	25	75	100	2	0	3	4
9	12I209	OBJECT ORIENTED PROGRAMMING LABORATORY	25	75	100	0	0	3	2
		TOTAL			900				30

THIRD SEMESTER

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	L	T	P	C
		THEORY							
1	12I3Z1	ENGINEERING MATHEMATICS- III	25	75	100	3	1	0	4
2	12I302	DISCRETE MATHEMATICS	25	75	100	3	1	0	4
3	12I303	MICROPROCESSORS, MICRO CONTROLLERS AND APPLICATIONS	25	75	100	3	0	0	3
4	12I304	ANALOG AND DIGITAL COMMUNICATION	25	75	100	4	0	0	4
5	12I305	DATA STRUCTURES AND APPLICATIONS –II	25	75	100	3	1	0	4
6	12I306	PROGRAMMING IN JAVA	25	75	100	3	0	2	4
		PRACTICAL							
7	12I307	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	25	75	100	0	0	3	2
8	12I308	DATA STRUCTURES LABORATORY	25	75	100	0	0	3	2
		TOTAL			800				27

FOURTH SEMESTER

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	L	T	P	C
		THEORY							
1	12I401	PROBABILITY, RANDOM PROCESSES AND QUEUING THEORY	25	75	100	3	1	0	4
2	12I402	ENVIRONMENTAL SCIENCE AND ENGINEERING	25	75	100	3	0	0	3
3	12I403	DATABASE SYSTEMS	25	75	100	3	0	0	3
4	12I404	COMPUTER ARCHITECTURE	25	75	100	3	0	0	3
5	12I405	SYSTEM PROGRAMMING AND OPERATING SYSTEMS	25	75	100	3	1	0	4
6	12I406	THEORY OF COMPUTATION	25	75	100	3	1	0	4
		PRACTICAL							
7	12I407	DATABASE SYSTEMS LABORATORY	25	75	100	0	0	3	2
8	12I408	SYSTEM PROGRAMMING AND OPERATING SYSTEMS LABORATORY	25	75	100	0	0	3	2
		TOTAL			800				25

FIFTH SEMESTER

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	L	T	P	C
		THEORY							
1	12I501	OBJECT ORIENTED ANALYSIS AND DESIGN	25	75	100	3	0	0	3
2	12I502	INFORMATION CODING TECHNIQUES	25	75	100	3	1	0	4
3	12I503	WEB TECHNOLOGY	25	75	100	3	0	0	3
4	12I504	COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS	25	75	100	3	1	0	4
5	12I505	DESIGN AND ANALYSIS OF ALGORITHMS	25	75	100	3	1	0	4
6	12I506	COMPUTER NETWORKS	25	75	100	3	0	0	3
		PRACTICAL							
7	12I507	WEB TECHNOLOGY LABORATORY	25	75	100	0	0	3	2
8	12I508	NETWORKING LABORATORY	25	75	100	0	0	3	2
		TOTAL			800				25

SIXTH SEMESTER

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	L	T	P	C
		THEORY							
1	12I601	EMBEDDED SYSTEM DESIGN	25	75	100	3	0	0	3
2	12I602	DISTRIBUTED COMPUTING	25	75	100	3	0	0	3
3	12I603	INFORMATION STORAGE MANAGEMENT	25	75	100	3	0	0	3
4	12I604	E-COMMERCE	25	75	100	3	0	0	3
5	12I605	FUNDAMENTALS OF DIGITAL SIGNAL PROCESSING	25	75	100	3	1	0	4
6	12I6Ex	ELECTIVE I	25	75	100	3	0	0	3
		PRACTICAL							
7	12I607	COMMUNICATION LABORATORY	25	75	100	0	0	3	2
8	12I608	GRAPHICS AND MULTIMEDIA LABORATORY	25	75	100	0	0	3	2
		TOTAL			800				23

SEVENTH SEMESTER

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	Credits			
						L	T	P	C
		THEORY							
1	12I701	MANAGEMENT INFORMATION SYSTEM	25	75	100	3	0	0	3
2	12I702	CRYPTOGRAPHY AND NETWORK SECURITY	25	75	100	3	0	0	3
3	12I703	SOFTWARE ENGINEERING	25	75	100	3	0	0	3
4	12I704	MOBILE COMPUTING	25	75	100	3	0	0	3
5	12I7Ex	ELECTIVE II	25	75	100	3	0	0	3
6	12I7Ex	ELECTIVE III	25	75	100	3	0	0	3
		PRACTICAL							
7	12I707	SOFTWARE ENGINEERING LABORATORY	25	75	100	0	0	3	2
8	12I708	NETWORK SECURITY AND ELECTIVE LABORATORY	25	75	100	0	0	3	2
		TOTAL			800				22

EIGHTH SEMESTER

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	Credits			
						L	T	P	C
		THEORY							
1	12I8Ex	ELECTIVE IV	25	75	100	3	0	0	3
2	12I8Ex	ELECTIVE V	25	75	100	3	0	0	3
		PRACTICAL							
3	12I801	PROJECT WORK AND VIVA VOCE	50	150	200	0	0	12	6
		TOTAL			400				12

LIST OF ELECTIVES FOR
B.TECH. INFORMATION TECHNOLOGY
(SIXTH SEMESTER)

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	Credits			
						L	T	P	C
1	12I6E0	APPLIED NUMERICAL METHODS	25	75	100	3	0	0	3
2	12I6E1	ENTERPRISE RESOURCE PLANNING	25	75	100	3	0	0	3
3	12I6E2	OPEN SOURCE SYSTEMS	25	75	100	3	0	0	3
4	12I6E3	BIOINFORMATICS	25	75	100	3	0	0	3
5	12I6E4	OPTIMIZATION TECHNIQUES AND APPLICATIONS	25	75	100	3	0	0	3

(SEVENTH SEMESTER)

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	Credits			
						L	T	P	C
1	12I7E0	HIGH PERFORMANCE ARCHITECTURE	25	75	100	3	0	0	3
2	12I7E1	XML AND WEB SERVICES	25	75	100	3	0	0	3
3	12I7E2	AI AND EXPERT SYSTEMS	25	75	100	3	0	0	3
4	12I7E3	DIGITAL IMAGE PROCESSING	25	75	100	3	0	0	3
5	12I7E4	GRID COMPUTING	25	75	100	3	0	0	3
6	12I7E5	COMPONENT BASED TECHNIQUES	25	75	100	3	0	0	3
7	12I7E6	PRINCIPLES OF WIRELESS COMMMUNICATION	25	75	100	3	0	0	3
8	12I7E7	DATA WAREHOUSING AND DATA MINING	25	75	100	3	0	0	3
9	12I7E8	HIGH PERFORMANCE NETWORKS	25	75	100	3	0	0	3
10	12I7E9	WIRELESS SENSOR NETWORKS	25	75	100	3	0	0	3

(EIGHTH SEMESTER)

S. No.	Subject Code	Course title	Session marks	Final Exam marks	Total marks	Credits			
						L	T	P	C
1	12I8E0	SOFTWARE TESTING	25	75	100	3	0	0	3
2	12I8E1	FUZZY LOGIC AND NEURAL NETWORKS	25	75	100	3	0	0	3
3	12I8E2	CLOUD COMPUTING	25	75	100	3	0	0	3
4	12I8E3	SOFTWARE PROJECT MANAGEMENT	25	75	100	3	0	0	3
5	12I8E4	COMPUTER VISION	25	75	100	3	0	0	3
6	12I8E5	SERVICE ORIENTED ARCHITECTURE	25	75	100	3	0	0	3
7	12I8E6	CRYPTOGRAPHY AND CRYPTANALYSIS	25	75	100	3	0	0	3
8	12I8E7	SEMANTIC WEB	25	75	100	3	0	0	3
9	12I8E8	VIRTUALIZATION TECHNIQUES	25	75	100	3	0	0	3
10	12I8E9	SOFTWARE QUALITY ASSURANCE	25	75	100	3	0	0	3

12I1Z1 COMMUNICATION SKILLS IN ENGLISH-I

[Common to all branches]

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UNIT-I (09)

Tenses - Word formation- Vocabulary (Synonyms & Antonyms)- Listening and transfer of information-Pronunciation Practice-Word Stress-Sentence Stress-Intonation-Introducing oneself-Role play activities based on real life situations-Non-Verbal Communication -Reading Comprehension (Skimming and Scanning)- An introduction to Letter Writing – E-Tender Notices

UNIT-II (09)

Technical Vocabulary-Abbreviations & Acronyms- Commonly Confused Words- Active Voice to Passive Voice-Impersonal Passive- Listening at Specific Contexts such as Airport, Railway Station, Bus Stand, Sea Port/Shipboard etc - Debates on Chosen Topics -Reading For Identifying Stylistic Features- Recommendations-Letter to the Editor of a News Paper

UNIT-III (09)

Subject-Verb Agreement (Concord) - Preposition-Listening to News in English- Mini Oral Presentation on the assumption of a historian, celebrity, famous Personality etc.- Reading and Note-making- - Notice-Agenda- Memo-Advertisement and Slogan Writing

UNIT-IV (09)

Common Errors in English-Conditional Statements -Use of Modal Auxiliaries- Definition-Listening to a Discussion at a Business Meeting- Group Discussion on chosen topics-Reading for interpreting tables, charts etc. - Writing E-mails-Graphic Description

UNIT-V (09)

Extensive Reading- APJ Abdul Kalam's "Wings of Fire"- An Abridged Special Edition for Students.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Book

   *Meenakshi Raman, Sangeetha Sharma, "**Technical Communication: English Skills for Engineers**" Oxford University Press: New Delhi, 2008*

Reference Books

*1. Rizvi Ashrav.M, "**Effective Technical Communication**" Tata McGraw Hill' New Delhi, 2005*

*2. Herbert, A.J, "**Structure of Technical English**": the English Language Society. Authentic NET Resources.*

12I1Z2 ENGINEERING MATHEMATICS – I

[Common to all branches]

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3 1 0 4

UNIT I MATRICES   (09)

Characteristic equation – Eigen values and Eigen vectors of a real matrix - Properties of Eigen values - Cayley-Hamilton Theorem(statement only) and applications- Diagonalisation by similarity transformation - Reduction of quadratic form to canonical form.

UNIT II HYPERBOLIC FUNCTIONS   AND SOLID GEOMETRY   (09)

Hyperbolic functions and Inverse Hyperbolic functions -Identities-Real and imaginary parts- solving problems using hyperbolic functions. Sphere – tangent plane – Orthogonal spheres - Cone- right circular cone – Cylinder – right circular cylinder.

UNIT III APPLICATIONS OF DIFFERENTIAL CALCULUS   (09)

Curvature - cartesian and polar coordinates – centre and radius of curvature - circle of curvature -Evolutes - Envelopes - Evolutes as envelope of normal.

UNIT IV FUNCTION OF SEVERAL VARIABLES   (09)

Function of two variables - Taylor's theorem (statement only) and expansions - maxima and minima - constrained maxima and minima by Lagrangian multiplier method - Jacobians - differentiation under integral sign.

UNIT V INTEGRAL CALCULUS   (09)

Gamma and Beta functions - Double integration - Cartesian and Polar Coordinates – change of order of integration - Area as double integral – Triple integration –Volume as a triple integral - Transformation to Cylindrical and Spherical co-ordinates.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Books

1. *Veerarajan.T., "**Engineering Mathematics**" for Semesters I and II , Tata McGraw Hill Publishing   Co., New Delhi., 2010.*

2. *Dr.Kandasamy.P., Dr.Thilagavathy.K and Dr.Gunavathy.K., "**Engineering Mathematics**"   for First Year B.E/B.Tech, S. Chand & Co., Ram Nagar, New Delhi, 2010.*

Reference Books

1. *N.P.Bali., Dr. Manish Goyal., "**A text book of Engineering Mathematics**" vol. I , University science Press, New Delhi,   2010.*

2. *H.C.Taneja., "**Advanced Engineering Mathematics**" vol. I, I.K.International Pub.House Pvt.Ltd., New Delhi, 2007.*

3. *Baburam., "**Engineering Mathematics**" vol. I, Pearson, New Delhi, 2010.*

4. *B.V.Ramana., "**Higher Engineering Mathematics**" Tata McGraw Hill Publishing   Co., New Delhi, 2007.*

5. *Grewal B.S., "**Higher Engineering Mathematics**" (40th Edition) Khanna Publishers, New Delhi., 2007*

12I103 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

[Common to CSE & IT]

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4 0 0 4

UNIT I FUNDAMENTALS OF DC AND AC CIRCUITS (12)

Fundamentals of DC circuits: Ohm's law, Kirchhoff's law, Simple resistive circuits –Effects of series and parallel resistances-Mesh and Nodal analysis.

Fundamentals of AC circuits: RMS and Average values of sine wave, Formfactor,peakfactor, Single phase AC circuits-impedance, power and power factor-RL,RC,RLC circuits-simple AC circuits.

UNIT II MACHINES AND TRANSFORMERS (12)

Electrical machines: Construction, Principle of operation, Basic Equations and Applications of DC Generator,DC Motors, Single Phase Transformer, Induction Motors and stepper Motors.

UNIT III INTRODUCTION TO SEMICONDUCTORS AND DIODES (12)

Semi conductors-N Type and P-Type- Construction and static characteristics of Junction diode.Power Supplies: Half Wave and Full Wave Rectifiers, Voltage Regulator, Zener Regulator, Filters-Voltage Multiplier-Introduction to SMPS and UPS.

UNIT IV TRANSISTORS-INTRODUCTIN TO SMALL SIGNAL AMPLIFIER (12)

Transistor-Types-Transistor characteristics Curve- Transistor as switch- Measuring gain-Amplification-Common Emitter, Common Base and Common Collector Amplifiers- Stabilizing the Amplifier-Field effect transistors, Junction field effect transistor-N Channel and P-Channel JFET, Priniciple of working of JFET and MOSFET-Characteristics, UJT and its characteristics.

UNIT V OP-AMP (12)

Basic information of op-amp-ideal op-amp- Basic inverting amplifier- Basic non-inverting amplifier- Differential amplifier-Dc-Characteristics of op-amp-op amp application: Inverting , non inverting- Summing amplifier, adder, Subtractor-op amp using diodes: Rectifier, Clipper, Clamper- Multiplier and divide using op-amp- Basic differentiator and integrator using op-amp.

LECTURE:60 TUTORIAL:0 TOTAL: 60

Text Books

Edward Hughes, I Mackenzie Smith, **"Electrical and Electronic Technology "**, 10th Edition, Pearson Education 2008.

Reference Books

1. *Prem Kumar and Arumugam,* **" Introduction to circuits analysis"**, *Khanna Publishers.*

2. *B.L .Theraja,* **" Electrical Technology"**-*Vol I & II-Nirja construction and development company,New Delhi.*

3. *K.Baskaran and J.Rangarajan,"* **Electric Circuits and Elecronic Devices"** *Pratheeba Publishers.*

4. *D.Roy Choudhury; Shail Jain,* **" Linear integrated Circuits"**,*4th edition, New Age science Limited,2011.*

5. *Millman and Hawkins-* **Electronic Devices and Circuits**.

12I104 - MATERIALS SCIENCE

[Common to all branches]

L T P C

3 0 0 3

UNIT-I CONDUCTING MATERIALS (09)

Introduction to Conductors – classical free electron theory of metals – Draw backs of classical theory – quantum theory - Electrical and Thermal conductivity of Metals – Derivation for Wiedemann – Franz law – Lorentz number — Fermi distribution function - effect of temperature – density of energy states – calculation of Fermi energy- carrier concentration in metals.

UNIT-II SEMICONDUCTING MATERIALS AND DEVICES (09)

Introduction – Properties – elemental and compound semiconductors - Intrinsic and extrinsic semiconductors – properties - Carrier concentration in intrinsic Semiconductor - variation of Fermi level with temperature and carrier concentration - Electrical Conductivity – band gap determination - extrinsic semiconductors - Carrier concentration in P- type and N-type semiconductors – variation of Fermi level with temperature and impurity concentration – Hall effect- Determination of Hall Co-efficient in N type and P type Semiconductor - Applications.

UNIT-III MAGNETIC AND SUPER CONDUCTING MATERIALS (09)

Introduction - Origin of magnetic moment - Bohr magnetron - Dia, Para, and Ferro magnetic materials - Domain theory of ferromagnetism - Hysteresis - Hard and Soft magnetic materials. Ferrites - structure and applications. - Magneto optical recording and readout – Superconductivity - Types of superconductors - BCS theory of superconductivity (qualitative) - properties- High T_c superconductors, Applications of superconductors- SQUID, Cryotron, Magnetic levitation.

UNIT-IV DIELECTRICS (09)

Introduction to dielectric materials – Electric polarization and Dipole moment - Electrical susceptibility – dielectric constant – Various polarization mechanisms in dielectrics - electronic, ionic, orientational and space charge polarization – frequency and temperature dependent of polarization – internal field – Claussius – Mosotti relation (derivation) – dielectric loss – dielectric breakdown –$BaTiO_3$ - Applications of dielectric materials.

UNIT-V MODERN ENGINEERING MATERIALS (09)

Metallic glasses- preparation of metallic glasses- properties – applications of the metallic glasses - Shape Memory Alloys (SMA) - Characteristics, properties of NiTi alloy - applications of the Shape memory alloys - advantages and disadvantages of SMA - Nanomaterials-synthesis –chemical vapour deposition – Sol Gels – ball Milling – properties of nanoparticles and applications of nanoparticles – Carbon Nanotubes (CNT) – structure – properties – applications of the CNTs.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

Ganesan S. Iyandurai N, "**Engineering Physics II**", Gems Publishers, Coimbatore 2009.

Reference Books

1. Jayakumar S, "**Materials Science**", RK Publishers, Coimbatore, 2004

2. William D Callister Jr, "**Materials Science and Engineering – An Introduction**",John Wiley and Sons Inc.,6th edition, New York, 2003

3. James F Shackelford, S "**Introduction to materials Science for Engineers**", 6th Macmillan Publishing Company, New York, 2004

12I105 – APPLIED CHEMISTRY

[Common to all branches]

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UNIT I BASIC ELECTROCHEMISTRY   (09)

EMF and thermodynamic principles of electrochemical systems- Nernst equation, problems- applications of emf measurement – potentiometric titrations- acid alkali, redox reactions – pH measurements using glass electrode- ion selective electrode- fluoride analysis, solubility of sparingly soluble salts – concentration cells – electrode/electrolyte – simple examples – Polarisation – concentration – over voltage.

UNIT II BATTERIES   (09)

Batteries - components – Characteristics – voltage , current , capacity, electrical storage density, energy density, discharge rate – types of batteries (primary and secondary)– primary- Zn- MnO_2, Zn- AgO , Zn- HgO , Li- SO_2Cl - cells- construction and working- Comparison of performance of primary cells–Secondary- Lead acid, Ni- Cd, Ni-Fe-Lithium ion batteries – Components – Characteristics-functioning-comparison of performances.

UNIT III CORROSION   (09)

Corrosion-spontaneity –chemical- oxidation corrosion- nature of oxides- Pilling and Bedworth rule - electrochemical corrosion – general mechanism- differential aeration- Pitting, Galvanic & stress corrosion. Prevention of corrosion-Proper design of structures, cathodic protection (sacrificial anode and impressed current cathodic), Inhibitors – Protective coatings- Paints, electro plating (plating of chromium and nickel only), electroforming and electropolishing - applications.

UNIT IV PLANAR TECHNOLOGY   (09)

Silicon-polycrystalline and single crystalline - crystal growth techniques-Czochralski process and float zone process-wafer preparation-PN junction formation by solid fusion-open type diffusion system, Ion implantation and molecular beam epitaxy –Deposition of dielectrical layers by crystal vapor deposition and sputtering techniques – Fabrication silicon devices - Masking and photolithography- Etching techniques wet and electrochemical – metal deposition techniques.

UNIT V POLYMERS   (09)

Monomers-functionality, Degree of polymerization-Coordination polymerization Zeigler-Natta catalyst, Polymers, structure , properties and their end uses of Polycarbonate, PVC, Polyamide, PET, Polyester, Teflon, Epoxy resin, Polyurethane, PMMA. Compounding of plastics- ingredients and functions, Fabrication-compression molding-Injection moulding-blow moulding & Extrusion moulding -Conducting polymers, poly acetylene, mechanism of conduction-natural rubber-vulcanization of rubberBiodegradable polymers - polylactide, cellulose, and starch.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Books

*1. Vairam S. and Ramadevi A., **Engineering Chemistry**, 1st Edn, Gem publishers, Coimbatore (2011).*

*2. Jain P.C & Jain. M,, **Engineering Chemistry**, 17ᵗʰ edn Dhanpat Rai publications (p) Ltd, New Delhi. (2008)*

Reference Books

1. *Puri Br, Sharma, Lr, Pathania M.S.* **Principles of Physical Chemistry**, *Vishal Publications Co(2008).*

2. *Thiyagi .M. S.* **Introduction to Semiconductor Materials and devices**, *John Wiley   & sons, Singapore(2000)*

3. *Pletcher D , Walsh,* **Industrial Electrochemistry**, *2 nd Edn. Kluwer, the language of Science, (2008)*

4. *Linden,* **Hand book of batteries and fuel cells**, *vol.1, 1 st Edn, Mc Graw Hill (1984).*

5. *Engineering Chemistry,* **A text book of Chemistry for Engineers**, *Wiley India Pvt . Ltd, (2011).*

12I106 PROGRAMMING IN C

[Common to CIVIL, EEE, ECE, CSE, IT & IBT]

L T P C

3 1 0 4

UNIT I BASICS OF COMPUTER, PROGRAMMING AND INFORMATION TECHNOLOGY   (09)

Digital Computer Fundamentals- Block diagram of a computer-Components of a Computer system-Applications of Computers-Hardware and Software definitions-Categories of Software-Booting-Installing and Uninstalling Software-Software privacy-Software terminologies-Information Technology Basics-History of Internet-Internet Tools. Problem solving Techniques-Program-Program development cycle-Algorithm-Flow Chart-Pseudo Code-Program control structures-Types and generation of programming languages-Development of algorithms for simple problems.

UNIT II BASIC ELEMENTS OF C   (09)

Introduction to C-C Declaration- Operators and Expressions-Input and output Functions- Decision statements: If-If else-Nested If else-If else If ladder-break-continue-goto-switch-nested switch case-Switch case and nested ifs-Loop control: for, nested for, while, do-while- do while statement with while loop-Arrays: initialization, characteristics, types and operations.

UNIT III POINTERS AND FUNCTIONS   (09)

Strings and Standard functions: Declaration and initialization, formats, standard, conversion and memory functions, applications; Pointers-pointers and address- declaration-void ,wild, constant pointers –arithmetic operations with pointers-pointers and arrays- pointers to pointers-pointers to pointers- pointers and strings; Functions-return statement-types-call by value and reference-returning more values, function as an argument, function with operators, decision statements, loop statements, arrays and pointers, recursion-Tower of Hanoi.

UNIT IV STORAGE CLASSES, STRUCTURE AND UNION   (09)

Storage classes: auto-extern-static-register; Preprocessor directives; Structures: Declaration and initialization, structure within structure-Array Of Structures-pointer to structure-structure and functions-typedef-bit fields- enumerated data types; union: calling BIOS and DOS services-union of structures.

UNIT V FILES, GRAPHICS AND DYNAMIC MEMORY ALLOCATION   (09)

Files: streams and file types-operations-File I/O-read and write-other –creating, processing and updating files-simple file handling programs-low level programming-command line arguments- Environment variables; Graphics: initialization-functions-library functions-text-patterns and styles-mouse programming-drawing non common figures; Dynamic memory allocation.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Books

1. *ITL Education solutions Limited, "**Introduction to Information Technology**",Pearson Education(India), 2005. (Unit I)(Chapter:1,7,9,10,15,16)*

2. *Ashok N. Kamthane, " **Programming in C**", Pearson Education,Second Edition,2012.*

Reference Books

1. *Byron Gottfried, "**Programming with C**", II Edition,(Indian Adapted Edition),TMH publications,2006.*

2. *Brain W.kernighan and Dennis M.Ritchie, "**The C programming language**" , Pearson Education Inc.(2005).*

3. *E. Balagurusamy, "**Programming in ANSI C**", 5E, Tata McGraw-Hill Education, 2011.*

12I107 WORKSHOP

[Common to all branches]

L T P C
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1. Introduction to use of tools and equipments in Carpentry, Welding, Foundry and Sheet metal.

2. Safety aspects in Welding, Carpentry and Foundry.

3. Half lap Joint and Dovetail Joint in Carpentry

4. Welding of Lap joint, Butt joint and T-joint

5. Preparation of Sand mould for cube, conical bush, pipes and V pulley.

6. Fabrication of parts like tray, frustum of cone and square box in sheet metal.

Total : 45

12I108 – CHEMISTRY LABORATORY

[Common to all branches]

L T P C
0 0 3 2

LIST OF EXPERIMENTS

1.   Estimation of hardness by EDTA method

2.   Estimation of chloride by argentometric method

3.   Determination Dissolved oxygen by Winkler's method

4.   Estimation of available chlorine in bleaching powder

5.   Estimation of copper and zinc in brass sample

6.   Estimation of manganese in steel sample.

7.   Surface area of activated carbon by adsorption technique using acetic acid

8.   Estimation of calcium and magnesium in magnesite ore

9.   Estimation of manganese in pyrolusite ore

10.   Conduct metric titration of mixture of strong and weak acids using strong base

11.   Potentiometric titration (Ferrous iron versus potassium dichromate)

12.   Estimation of sodium or potassium using flame photometer

13.   Estimation nickel using spectrophotometer

14.   Estimation of iron by spectrophotometer.

(Any twelve experiments only)

Reference Books

1. *A.O.Thomas, **Practical Chemistry**, 6th Edn, Scientific book centre, Kannanore (1995)*

2. *Arthur I. Vogel, **Quantitative Inorganic Analysis**, 3rd Edn, ELBS (1970)*

12I109 C PROGRAMMING LABORATORY

(Common to CIVIL, EEE, EIE, ECE, CSE, IT & IBT)

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EXERCISES ILLUSTRATING THE FOLLOWING CONCEPTS:

1.   Operators , Expressions and IO formatting

2.   Decision Making and Looping

3.   Arrays and Strings

4.   Functions and Recursion

5.   Pointers

6.   Dynamic Memory Allocation

7.   Structures

8.   Unions

9.   Files

10.   Command line arguments

11.   Graphics.

12.   Mini Project

12I2Z1 COMMUNICATION SKILLS IN ENGLISH-II

[Common to all branches]

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UNIT I (09)

Use of Relative Clauses-Noun Phrases- Listening to Conversations- Telephonic Conversational Skills Paralinguistic Communication (Articulation, Stress and Pause) – Cloze Reading-Reading to practice stress, pause etc. -Process Description- Transcoding.

UNIT II (09)

Cause and Effect Expressions-Time and Contracted Time Statements- Listening to Narration/Speech – Extemporaneous -Instructions with Imperatives- Reading for inferring meaning: Lexical and Contextual - Understanding the organisation of the Texts -Writing Articles (Technical & General).

UNIT III (09)

Phrasal Verbs -American and British Vocabulary- Video Listening: Listening to Authentic Clippings in English (Movie/ Play)-Making Speeches (Introducing a Chief Guest, Delivering Welcome Address, Proposing Vote of Thanks)-Reading for understanding discourse cohesion-Logical Connectives- Minutes of the Meeting.

UNIT IV (09)

Idiomatic Expressions -Numerical Expressions- Listening to authentic songs in English-Mock Interviews-Reading for identifying the topic sentence in each paragraph-An Introduction to Different kinds of Report-Report on an Industrial Visit-Report on an accident.

UNIT V (09)

Abstract – foot notes-bibliography-plagiarism- Technical Style- Presentation of a Mini Project Report of 25 to 30 pages on one of the topics from the First Year B.E Syllabus or similar topics.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Reference Books

1. *Meenakshi Raman, Sangeetha Sharma, "**Technical Communication: English Skills for Engineers"** Oxford University Press: New Delhi, 2008*

2. *Rizvi Ashrav.M, "**Effective Technical Communication**" Tata McGraw Hill:New Delhi, 2005*

3. *Herbert, A.J, "**Structure of Technical English**": the English Language Society*

4. *Authentic NET Resources*

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12I2Z2 ENGINEERING MATHEMATICS – II

[Common to CSE & IT]

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UNIT I VECTOR CALCULUS (09)

Gradient , Divergence , Curl – Directional derivative – Irrotational and Solenoidal fields-Vector identities - Line, Surface and Volume Integrals – Green's Theorem in a Plane , Gauss Divergence and Stoke's Theorems (Statements only) – Verifications and Applications.

UNIT II ORDINARY DIFFERENTIAL EQUATIONS (09)

Linear equations of Second and Higher order with constant coefficients-Simultaneous first order   Linear   equations with constant coefficients - Linear equations of Second and Higher order with variable coefficients -Legendre type Method of variation of parameters-method of reduction of order.

UNIT III COMPLEX DIFFERENTIATION (09)

Functions of a Complex variable-Analytic functions- Cauchy Riemann equations and sufficient conditions(excluding proof)–Harmonic and orthogonal properties of analytic functions –Construction of analytic functions-Conformal mappings : $w = z + a$, az ,$1/z$, z^2, e^z ,cosz, sinz and Bilinear Transformation.

UNIT IV COMPLEX INTEGRATION (09)

Cauchy's integral theorem, Cauchy's integral formula -Taylor's and Laurent's theorems (Statements only) and expansions – Poles and Residues – Cauchy's Residue theorem – Contour integration – Circular and semicircular contours

UNIT V LAPLACE TRANSFORMATIONS (09)

Laplace transforms - Properties and standard transforms-Transforms of unit step, unit impulse and error functions – Transforms of periodic functions - Inverse Laplace transforms - Initial and Final value theorems –Convolution theorem(statement only) and applications- Applications to Solution of Linear y differential equations of second order with constant coefficients.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Books

1. *Veerarajan.T., "**Engineering Mathematics" for Semesters I and II** , Tata McGraw Hill Publishing Co., New Delhi., 2010.*

2. *Dr.Kandasamy.P., Dr.Thilagavathy.K and Dr.Gunavathy.K., "**Engineering Mathematics**"   for First Year B.E/B.Tech, S. Chand & Co., Ram Nagar, New Delhi, 2010.*

Reference Books

1. *N.P.Bali., Dr. Manish Goyal., "**A text book of Engineering Mathematics**" vol. II , University science Press, New Delhi,   2010.*

2. *H.C.Taneja., "**Advanced Engineering Mathematics**" vol.II, I.K.International Pub. House Pvt.Ltd., New Delhi, 2007.*

3. *Baburam., "**Engineering Mathematics**", Pearson, New Delhi, 2010.*

4. *B.V.Ramana., "**Higher   Engineering Mathematics**" Tata McGraw Hill Publishing   Co., New Delhi, 2007.*

5. *Grewal B.S., "**Higher Engineering Mathematics**"(40ᵗʰ Edition) Khanna Publishers, New Delhi., 2007.*

12I203 ENGINEERING PHYSICS

[Common to CSE & IT]

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UNIT I LASERS (09)

Introduction- Principle of laser action - characteristics of laser - Spontaneous emission and Stimulated emission –Einstein's coefficients - population inversion – methods of achieving population inversion -Types of pumping –Optical Resonator - Types of Lasers – Principle, construction and working of different types of laser- CO_2, Nd-YAG, Semiconductor laser and Dye laser- applications of laser -Lasers in microelectronics, welding, heat treatment, cutting – holography – construction and reconstruction of a hologram – applications of holography.

UNIT II FIBER OPTICS AND APPLICATIONS (09)

Introduction – Basics Principles involved in fiber optics- Total internal reflection – Structure of optical fiber –Propagation of light through optical fiber –Derivation for Numerical Aperture and acceptance angle - fractional index change - Preparation of optical fiber- Crucible and Crucible technique - Classification of optical fiber based on materials, refractive index profile and Modes - Splicing-fusion and multiple splices - Light sources for fiber optics.- LED- Detectors- Principle of photo detection - PIN Photodiode, - Fiber optical communication links-Fiber optic sensors-Temperature, displacement.

UNIT III QUANTUM PHYSICS AND APPLICATIONS (09)

Limitations of classical Physics - Introduction to Quantum theory - Dual nature of matter and radiation- de-Broglie wavelength in terms of voltage, energy, and temperature –Heisenberg's Uncertainty principle – verification - Schrödinger's Time independent and Time dependent wave equations – physical significance of a wavefunction - Particle in a one dimensional deep potential well– microscope – basic definitions of microscope - Electron microscope-Scanning Electron Microscope (SEM)-Transmission Electron Microscope (TEM).

UNIT IV ULTRASONICS (09)

Introduction – properties of ultrasonic waves – production of ultrasonic waves Magnetostriction effect- Magnetostriction generator- Piezoelectric crystals - Piezoelectric effect- Piezoelectric generator- Detection of ultrasonic wave – kundt's tube method – sensitive flame method – thermal detector method – piezo electric detector method- cavitation - industrial applications- ultrasonic drilling- ultrasonic welding- ultrasonic soldering and ultrasonic cleaning-Non- destructive Testing-Pulse echo system, through transmission and resonance system.

UNIT V CRYSTAL PHYSICS (09)

Introduction – Crystalline and Non-crystalline materials –Lattice – Unit Cell –Crystal system - Bravais lattices – 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– Polymorphism and allotropy – Crystal defects – Point, line and surface defects.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

   Ganesan S. Iyandurai N, **"Engineering Physics I",** *Gems Publishers, Coimbatore,2010*

Reference Books

1. *Gaur R K and Gupta S L-"**Engineering Physics",** Dhanpat Raj and sons, 2002*

2. *Avadhanulu M N and Kshirsagar P G,"**A textbook of Engineering Physics"** S.Chand and Company Ltd,NewDelhi,2005*

3. *Arumugam M- "**Engineering Physics",** Anuadha Publishers, 2002*

4. *Jayakumar S, "**Engineering Physics"**, RK Publishers, Coimbatore, 2003*

12I204 OBJECT ORIENTED PROGRAMMING USING C++

[Common to CSE & IT]

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UNIT I CONCEPTS   (09)

Complexity:Inherent Complexity-Structure-bringing Order to Chaos-On Designing Complex Systems;Object Model: Evalution-Elements-Applying Object Model;Classes and Objects-Nature of an Object-Relationships- Nature of a Class- Relationship among Classes-Interplay of classes and objects-On building Quality classes and objects; Classification-importance-identifying classes and objects-key abstraction and mechanisms.

UNIT II METHODS   (09)

Notation: Elements-class diagram-state transition, object, Interaction, Module, Process diagram-Applying the Notation; Process: Principles-micro, macro development process; Pragmatics: Management and Planning-staffing-Release management-Reuse-Quality Assurance and Metrics-Documentation-tools-Benefits and Risks

UNIT III OVERVIEW OF C++   (09)

Introduction - Variables and basic types - library types- Arrays - Pointers- Expressions- Statements - Functions -I/O library**.**

UNIT IV CLASSES AND DATA ABSTRACTION   (09)

Classes: definitions and Declarations-this pointer-scope constructors-friend   ,static class members; Copy control; Overloading operations and conversions; Definitions, Input, output operators, arithmetic, relational, assignment, subscript, member access, increment and decrement, call operators, function objects, conversions and class types.

UNIT V OBJECT ORIENTED AND GENERIC PROGRAMMING   (09)

Object Oriented Programming: Inheritance, virtual functions; Templates-Template compilation models-class template members-generic handle class-template specialization-overloading and function templates-exception handling.

LECTURE: 45 TUTORIAL: 0 TOTAL:45

Text Books

1. *Grady Booch,"**Object Oriented Analysis and Design**",Second Edition,pearson Education,2008.*

2. *Stanley B.Lippman Josee Lajoie,Barbara E.Moo,"**C++ Primer**",4th Edition,Pearson Education,2008*

Reference Books

1. *Ali Bahrami,"**Object oriented systems Development**",TMH,second reprint 2008.*

2. *Herbert Schildt,"**The Complete Reference C++**",Tata Mc Graw-Hill Pub.Co.Ltd.,4th edition,2003.*

3. *Ira Pohl,"**Object oriented programming Using C++**",second Edition,Pearson Education ,2008.*

4. *VenuGopal K.R.,Rajkumar,Ravishankar.T," **Mastering C++**", Tata Mc Graw-Hill Pub.Co.Ltd.,1999.*

12I205 DIGITAL SYSTEMS

[Common to CSE & IT]

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UNIT I BOOLEAN ALGEBRA AND LOGIC GATES (09)

Digital Systems, Binary Numbers, Number Conversions-Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Introduction to Boolean Algebra and Logic Gates –Boolean functions - Canonical and Standard Forms-Digital Logic gates –Digital Integrated Circuits-Introduction, Special Characteristics, Different Logic Families.

UNIT II GATE LEVEL MINIMIZATION (09)

Introduction, The Map Method, Four Variable Map, Five Variable Map, Product of Sums Simplification, Don't Care Conditions, NAND and NOR implementation, Exclusive –OR Function, Hardware Description Language.

UNIT III COMBINATIONAL LOGIC (09)

Combinational circuits- Analysis and Design Procedure- Binary Adder- Subtractor- Decimal Adder – Binary Multiplier – Magnitude Comparator – Decoders- Encoders- Multiplexers- HDL for Combinational Circuits.

UNIT IV SYNCHRONOUS AND ASYNCHRONOUS SEQUENTIAL LOGIC (09)

Sequential circuits- Latches – Flip flops – Analysis of Clocked Sequential Circuits – HDL Models for sequential Circuits-State Reduction and Assignment- Design Procedure. Asynchronous Circuits- Analysis Procedure- Circuits with Latches – Reduction of State Flow Tables – Race Free State Assignment –Hazards- Design Example.

UNIT V REGISTERS , COUNTERS AND MEMORY (09)

Registers, Shift Registers, Ripple Counters, Synchronous Counters, HDL for Registers and Counters, Random access memory, Memory Decoding, Error Detection and correction, Read only Memory, Programmable Logic Array. Register Transfer Level Introduction, RTL in HDL, Algorithmic State Machines, Binary Multiplier, HDL for ASM and Binary Multiplier.

LECTURE: 45 PRACTICAL : 15 TOTAL: 60

Experiments

1. Design a Combinational circuit.

2. Design a Sequential circuit.

3. Design and implementation of Flip flops

4. Design and implementation of Shift registers

5. Design and implementation of Synchronous and Asynchronous counters.

6. Simulation of Combinational circuits using VHDL

Text Book

  *Morris Mano , "**Digital Design", Prentice Hall of India Private Ltd, 4th Edition, 2006.*

Reference Books

1. *Bhasker.J, "**A VHDL Primer**", Prentice Hall India, 2003.*

2. *Charles H.Roth," **Fundamentals of Logic Design** ", Fourth Edition, Jaico Publishing House, 2000.*

3. *Peter J. Ashenden," **Digital design-An embedded system approach using Verilog**",Morgan Kaufmann publishers,2008*

12I206 DATA STRUCTURES AND APPLICATIONS-I

[Common to CSE & IT]

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UNIT I PROBLEM SOLVING (09)

Problem Solving – Top-Down Design – Implementation – Verification – Efficiency Analysis – Sample Algorithms

UNIT II STACKS AND QUEUES (09)

Implementation of Stacks – Linked Stacks – Introduction to Recursion – Backtracking – Principles of Recursion – Methods For Removing Recursion – Implementation of Queues – Circular Queues In C – Applications of stacks and Queues: Function calls, Balancing Symbols, Evaluation of Polish Expression – Translation from Infix to Polish, Simulation

UNIT III LINKED LISTS (09)

Pointers And Linked List – Linked Queues - Abstract Data Type – Implementations – List Specifications – Implementation of Lists – Doubly Linked List – Comparison of Implementations – Strings – Linked Lists in Arrays – Application: A Text Editor , Polynomial Arithmetic

UNIT IV BINARY TREES (09)

Introduction – Threaded Binary Tree – Binary Search Tree – AVL Tree – Tree Traversals – Applications: Implementation of File System, Evaluation of Arithmetic Expression.

UNIT V GRAPHS (09)

Introduction – Graph Traversal – Topological Sorting – Dijkstra's Algorithm – Minimal Spanning Tree – Applications – DFS – Biconnectivity – Euler Circuits – Graph Coloring Problem.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Books

1. *R.G.Dromey,"**How To Solve It By Computer**" ,Pearson Education, Chapter 1.*

2. *Robert Kruse, C.L.Tondo, Bruce Leung, Shashi Mogella, "**Datastructures And Program Design In C**", Pearson Education, 2nd Edition, Chapters 3-5,9,11.*

Reference Books

1. *Jean-Paul Tremblay & Paul G.Sorenson, "**An Introduction to Data Structures with Applications**", Tata McGraw Hill Publishing Book Company , 2007.*

2. *Ellis Herowitz,"**Fundamentals of Data Structures in C**" , Computer Science Press, division of W.H.Freeman,Newyork,1992.*

12I207 PHYSICS LABORATORY

[Common to all branches]

(Any Eight experiment)

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LIST OF EXPERIMENTS

1. Spectrometer - diffraction grating

    Normal incidence method

2. Air wedge

3. Youngs modulus – cantilever bending

    Koening's method

4. Particle size determination

5. Thermal conductivity of the bad conductor

    Lee's disc method

6. Ammeter and voltmeter calibration – low range

7. Resistance of the given coil of wire – carey

    Foster's bridge

8. Torsional pendulum

9. Young's modulus - non uniform bending

10. Transistor characteristics

TOTAL: 45

12I208 ENGINEERING GRAPHICS

(Common to all branches)

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GEOMETRICAL CONSTRUCTIONS (15)

Dimensioning- Lettering-Types of Lines-Scaling conversions- Dividing a given straight line in to any number of equal parts-Bisecting a give angle-Drawing a rectangular polygon given one side-Special methods of constructing a pentagon and hexagon-Construction of curves like ellipse, parabola, cycloid and involute using one method.

ORTHOGRAPHIC PROJECTIONS (25)

Introduction to Orthographic Projection-Projection of points-Projection of straight lines with traces-Projection of planes-Conversion of pictorial views to orthographic views-Projection of solids-Auxiliary projections

SECTION OF SOLIDS AND DEVELOPMENT (15)

Section of solids-Development of surfaces

INTERPETRATION OF SOLIDS (10)

Cylinder and cylinder, cone and cylinder only

PICTORIAL VIEWS (10)

Isometric projections-Conversion of orthographic views to pictorial views (simple objects).

LECTURE: 30 PRACTICAL: 45 TOTAL: 75

Reference Books

1. *K. Vengopal, "**Engineering Graphics**", New Age International (P) Limited, 2007*

2. *Dhananjay.A.Jolhe, "**Engineering Drawing**" Tata McGraw Hill Publishing Co., 2007*

3. *K.V.Nataraajan, "**A Text Book of Engineering Graphics**", Dhanalakshmi Publishers, Chennai, 2006*

4. *M.B.Shah and B.C.Rana, "**Engineering Drawing**", Pearson Education, 2005*

5. *Luzadder and Duff, "**Fundamentals of Engineering Drawing**", Prentice Hall of India Pvt Ltd, XI Edition, 2001*

12I209 OBJECT ORIENTED PROGRAMMING LABORATORY

[Common to CSE & IT]

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LIST OF EXPERIMENTS

1. Classes and Objects

2. Arrays and Structures

3. Functions

4. Inheritance

5. Operator Overloading

6. Function Overloading

7. Virtual Functions

8. Pointers

9. Templates

10. Files and Streams

11. Exception handling

12. Mini project

12I3Z1 ENGINEERING MATHEMATICS – III

(Common to all branches)

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UNIT I PARTIAL DIFFERENTIAL EQUATIONS   (09)

Formation of PDE by elimination arbitrary constants and functions – Solutions of standard first order partial differential equations – Lagrange's equation – Linear partial differential equations of second and higher order with constant coefficients-homogeneous and non homogeneous types.

UNIT II FOURIER SERIES   (09)

Dirichlet's Conditions – General Fourier Series –Odd and even functions- Half range Sine and Cosine series – Parseval's Identity – Harmonic Analysis.

UNIT III FOURIER TRANSFORMS   (09)

Statement of Fourier integral Theorem – Fourier transform pair– Fourier Sine and Cosine Transforms – Properties – Transforms of Simple functions- Convolution Theorem – Parseval's Identity-Finite Fourier transforms

UNIT IV BOUNDARY VALUE PROBLEMS   (09)

Method of separation of variables – One dimensional wave equation – One dimensional heat equation – Unsteady and Steady state conditions –Fourier series solution.

UNIT V Z-TRANSFORMS   (9)

Z-transforms - Elementary properties-Inverse Z-transform - Initial and Final value theorems - Convolution theorem - Formation of difference equations - Solution to difference equations of second order with constant coefficients using Z - transform.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Book

Veerarajan.T., *"Transforms and Partial Differential Equations"*, *Tata McGraw Hill Publishing Co., New Delhi. 2010.*

Reference Books

1. *N.P.Bali., Dr. Manish Goyal., "Transforms and Partial Differential Equations" , University science Press, New Delhi, 2010.*

2. *Dr.Kandasamy.P., Dr.Thilagavathy.K and Dr.Gunavathy.K., "Engineering Mathematics" for Third Semester B.E/B.Tech, S. Chand & Co., Ram Nagar, New Delhi, 2010.*

3. *B.V.Ramana., "Higher Engineering Mathematics" Tata McGraw Hill Publishing Co., New Delhi, 2007.*

4. *Grewal B.S., "Higher Engineering Mathematics" (40th Edition) Khanna Publishers, New Delhi., 2007.*

5. *Glyn James, "Advanced Modern Engineering Mathematics" (8th Edition) Wiley India , New Delhi., 2007.*

12I302 DISCRETE MATHEMATICS
[Common to CSE & IT]

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UNIT I MATHEMATICAL LOGIC   (09)

Propositional Logic Statements and Notations, Connectives, Normal Forms, The theory of Inference for the Statement calculus, Predicate Calculus, Inference theory of the predicate calculus.

UNIT II SET THEORY   (09)

Basic Concepts of set theory, Representation of Discrete Structures, Relations and Ordering, Functions, Natural Numbers, Recursion, Recursion in mechanical theorem proving.

UNIT III ALGEBRAIC STRUCTURES   (09)

Algebraic systems, Semigroups and Monoids, Grammars and Languages, Polish Expressions and their compilation, Groups, Application of residue arithmetic to computers,Group codes.

UNIT IV LATTICES AND BOOLEAN ALGEBRA   (09)

Lattices and partially ordered sets, Boolean Algebra, Boolean Functions, Representation and Minimization of Boolean Functions, Design Examples using Boolean Algebra, Finite State machines.

UNIT V GRAPH THEORY   (09)

Basic concepts of Graph theory, Storage representation and Manipulation of graphs, Simple precedence grammars, PERT and related techniques, Introduction to Computability Theory.

LECTURE: 45 TUTORIAL : 15 TOTAL: 60

Text Book

Tremblay.J.P and Manohar.R, " **Discrete Mathematical Structures with Applications to Computer Science** *", Tata Mc-Graw Hill Company, 2007.*

Reference Books

1. *Liu C.L, "* **Elements of Discrete Mathematics** *", Mc-Graw Hill International, 2nd Edition, 2000.*

2. *Kenneth H. Rosen, "* **Discrete Mathematics and its Applications** *", Mc-Graw Hill Company, 2007.*

3. *Thomos Koshy, "* **Discrete Mathematics with Applications** *", Elsevier Publications, Second edition,2006.*

4. *Ralph.P.Grimaldi, "* **Discrete and Combinatorial Mathematics:An Applied Introduction** *", Pearson Education Asia , New Delhi – Fourth Edition 2002.*

5. *Seymour Lipschutz and Mark Lipson, "* **Discrete Mathematics** *",Schaum's outlines, Tata Mc Graw Hill Company, New Delhi, 2007.*

6. *Veerarajan.T., "* **Discrete Mathematics** *", Tata McGraw Hill Publishing Co., New Delhi., 2010.*

7. *T.Sengadir, "* **Discrete Mathematics and Combinatorics** *", Pearson Education Asia, 2009.*

8. *Bhavani Satyanarayana, Kucham Syam Prasad, "* **Discrete Mathematics and Graph theory** *", PHI Learning Pvt Ltd, New Delhi, 2009.*

9. *Sachinder Bal Gupta, "* **Discrete Mathematics and Structures** *", University Science Press, 2008.*

12I303 MICROPROCESSORS, MICROCONTROLLERS AND APPLICATIONS

(Common to CSE & IT)

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UNIT I 8 BIT MICROPROCESSOR (09)

8085 architecture- Timing diagrams – ROM/ RAM Interfacing – Decoding of memory addresses – Interrupts – Vector interrupts – ISS - instruction set- Programming with 8085.

UNIT II 16 BIT MICROPROCESSOR (09)

Architecture of 8086 – 8086 in MIN/ MAX mode – Addressing modes- Instruction set - Programming with 8086.

UNIT III PERIPHERALS AND INTERFACING   WITH 8085 (09)

Serial and parallel I/O (8251 and 8255) – Programmable DMA controller (8257) Programmable interrupt controller (8259) – Keyboard and Display controller (8279) - Timer (8253) - ADC/ DAC interfacing.

UNIT IV MICROCONTROLLER (09)

INTEL 8051 Architecture – 8051 Microcontroller hardware – Ports and Circuits – External memory – Counter and timers – Serial data I/O – Interrupts – Instruction set - Programming examples - Applications of 8051.

UNIT V MICROPROCESSOR BASED APPLICATIONS (09)

Temperature controller - Stepper motor control – Traffic light control – Robotics and Embedded Control - Washing machine Control - Mining Problem - Turbine motor.

LECTURE: 45 TUTORIAL: 0 TOTAL:45

Text Books

1. *Ramesh S.Gaonkar, "**Microprocessor - Architecture, Programming and Applications with the 8085 **", Penram International publishing private limited, fifth edition, 2002.*

2. *Krishna Kant , "**Microprocessors and Microcontrollers **", Easter Economy Edition , 2007*

Reference Books

1. *Douglas V.Hall, " **Microprocessors and Interfacing: Programming and Hardware **", Tata Mc- Graw Hill, Third edition, 2006.*

2. *Barrey B.Brey, " **The INTEL Microprocessor 8086/8088,80186,286,386,486, Pentium and Pentium Pro processor – Architecture , Programming and   Interfacing **", Pearson Education Asia , 1998.*

3. * Myke Predko " **Programming and Customizing the 8051 Microcontroller **", Tata McGraw- Hill Edition , 1999.*

4. *Ray.A.K. & Bhurchandi.K.M., " **Advanced Microprocessors and Peripherals - Architectures, programming and Interfacing **", Tata Mc-Graw Hill, 2002 reprint.*

12I304 ANALOG AND DIGITAL COMMUNICATION

(Common to CSE & IT)

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UNIT I FUNDAMENTALS OF ANALOG COMMUNICATION (12)

Principles of amplitude modulation-AM envelope, frequency spectrum, bandwidth, modulation index, percent modulation, Voltage and power distribution, AM detector – peak detector, Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves, FM detector – slope detector

UNIT II DIGITAL COMMUNICATION (12)

Introduction, Shannon limit for information capacity, ASK transmitter, receiver and bandwidth, FSK transmitter, receiver and bandwidth, BPSK transmitter, receiver and bandwidth, QPSK transmitter, receiver and bandwidth, Quadrature Amplitude modulation – transmitter, receiver and bandwidth, bandwidth efficiency, carrier recovery – squaring loop, Costas loop, DPSK – transmitter and receiver

UNIT III DIGITAL TRANSMISSION (12)

Sampling theorem, reconstruction of message from its samples, Pulse modulation, PCM – PCM sampling, quantization, signal to quantization noise rate, companding – analog and digital – percentage error, delta modulation-transmitter and receiver, adaptive delta modulation, differential pulse code modulation-transmitter and receiver, pulse transmission – Intersymbol interference, ISI, Nyquist criteria for distortionless transmission.

UNIT IV SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES (12)

Pseudo-noise sequence, Direct Sequence spread spectrum with coherent binary PSK, Frequency-hop spread spectrum – slow and fast hopping, multiple access techniques-FDMA, TDMA, CDMA and SDMA, wireless communication-frequency reuse and cell splitting, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications.

UNIT V MICROWAVE AND OPTICAL COMMUNICATION (12)

UHF and microwave antennas –parabolic and conical horn antenna, frequency modulated microwave radio system – transmitter, receiver and repeater, Line of sight path characteristics, Optical fiber Communication System, Light propagation in fiber, Optical fiber classification, Looses in optical fibers, Sources and Detectors

LECTURE: 60 TUTORIAL: 0 TOTAL: 60

Text Books

1. Wayne Tomasi, **"Electronic Communication Systems: Fundamentals Through Advanced"**, Pearson Education, 2001

2. *Simon Haykin, "Communication Systems", 4th Edition, John Wiley & Sons., 2001.*

Reference Books

1. *B.P.Lathi,"Modern Analog And Digital Communication systems", 4/e, Oxford University Press, 2009*

2. *G Kennedy, B Davis and S R M Prasanna "Electronic communication systems" Tata Mc-Graw Hill Educatio Pvt Limited, Fifth Edition 2011*

3. *H.Taub,D L Schilling ,G Saha ,"Principles of Communication"3/e,2007.*

4. *Martin S.Roden, "Analog and Digital Communication System", 3rd Edition, PHI, 2002.*

5. *B.Sklar,"Digital Communication Fundamentals and Applications"2/e Pearson Education 2007.*

6. *V ChandraSekar, "Analog communication" Oxford University press, 2010*

7. *Louis E. Frenzel "Principles of Electronic Communication Systems", special Indian edition, Tata Mcgraw Hill Education Private Limited, 2008.*

12I305 DATA STRUCTURES AND APPLICATIONS –II

[Common to CSE & IT]

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UNIT I SORTING AND SEARCHING TECHNIQUES (09)

Sorting: Selection sort – Bubble sort – Insertion sort – shell sort – Tree sort: Heap sort – Partition-Exchange sort – Radix sort – Address Calculation sort. Searching: Sequential search – Binary search.

UNIT II SEARCH TREES AND BALANCED SEARCH TREES (09)

Two models of search trees- General properties of transformation-Height of search tree-Basic find, insert and delete-Returning from leaf to root-Dealing with non unique keys-queries for the keys in an interval-Building optimal search trees-converting trees into list- Removing a Tree-Height-balanced trees – Weight balanced trees –(a,b)-and B-trees-Red-black trees – Top down Rebalancing- Trees with constant update at a known location.

UNIT III TREE STRUCTURES FOR SETS OF INTERVALS (09)

Finger trees and level linking – Trees with partial Rebuilding – Splay Trees – Skip list – joining and splitting balanced search trees – Interval trees – segment trees – Trees for the union of intervals – Trees for sum of weighted intervals – Trees for interval restricted maximum sum queries – Orthogonal range trees – Higher dimensional segment trees – Other systems of building blocks – Range-counting and semi group model – kd-trees and related structures.

UNIT IV HEAPS AND UNIONS (09)

Balanced search trees as heaps - Array-based heaps – Heap-ordered trees and Half-ordered trees – Leftist heaps – Skew heaps – Binomial heaps – Changing keys in heaps – Fibonacci heaps – Heaps of optimal complexity – Double-ended heap structures and multidimensional heaps – Heap- related structures with constant-time updates – Union-find: merging classes of a partition - Union-find: with copies and dynamic segment trees – List splitting – Problems on root directed trees – Maintaining a linear order.

UNIT V DATA STRUCTURE TRANSFORMATION AND HASH TABLES (0 9)

Making structure dynamic-Making structure persistent-Data structures for strings: Tries and compressed tries-Dictionaries allowing errors in queries-Suffix trees-Suffix arrays-Hash tables: Basic hash tables and collision resolution-Universal families of hash functions-Perfect hash functions-Hash trees-Extendible hashing-Membership testers and bloom filters. Applications: IP router table, Multidimensional packet classification-Data structures in web information retrieval-Web as a dynamic graph-Collision detection.

<div align="right">

LECTURES: 45 TUTORIAL: 15 TOTAL: 60

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Text Books

1. Jean-Paul Tremblay & Paul G. Sorenson, **"An Introduction to Data Structures with Applications",** Tata McGraw Hill Publishing Book Company, 2007.

2. Peter brass," **Advanced data structures**", Cambridge University press, 2008

Reference Books

1. Robert L. Kruse, Bruce P.Leuag & Clovis L.Tondo, "**Data Structure and Program Design in C",** Prentice Hall of India Pvt. Ltd., 2002.

2. Sara Baase, Allen Van Gelder, **"*Computer Algorithms*",** Pearson Education, Third Edition.

3. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, Clifford Stein, "*Introduction to Algorithms*"**,** Third Edition, Prentice-Hall India, 2009.

4. Arpita Gopal, **" *Magnifying Data Structures*"**, PHI,2002.

5. Dinesh P.Mehta," *Handbook of Data structures and applications*", CRC Computer and Information Science series, 2005.

12I306 PROGRAMMING IN JAVA

[Common to CSE & IT]

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UNIT I FUNDAMENTALS OF JAVA PROGRAMMING   (09)

History and Evolution of Java, Overview of java, Operators, Control Structures, Methods, Classes and Objects, Inheritance, Packages and Interfaces, Exception Handling.

UNIT II THREADS, I/O AND UTILITIES   (09)

Multi threaded Programming, Enumeration, Auto boxing, Annotations, I/O, applets and other topics, Generics, String Handling, Input/Output: Exploring java.io.

UNIT III NETWORKING, APPLETS AND EVENT HANDLING   (09)

Networking, The Applet class, Event Handling, Introducing the AWT: working with windows, graphics and text, Using AWT controls, Layout Manager and menus.

UNIT IV IMAGING, RMI AND DATABASE CONNECTIVITY   (09)

Imaging – Creating, loading and displaying, Image observer, Double buffering, Media tracker, Image producer, consumer, filters, animation, Remote Method Invocation, Java Database Connectivity.

UNIT V SOFTWARE DEVELOPMENT USING JAVA   (09)

Javabeans, Introducing and exploring Swings, Servlets. Case Study: Applying Java and Java Enterprise Applications.

EXPERIMENTS

1.   Implementation of inheritance and interfaces
2.   Implementation of multithreading and Exception Handling
3.   Applet, AWT programming and Event Handling
4.   Program for network connection and monitoring
5.   Program for connecting to a database and database manipulation
6.   RMI Implementation and Servlet programming
7.   Software development using Java
8.   Mini Project

LECTURE: 45 PRACTICALS: 15 TOTAL: 60

Text Book

   Herbert Schildt, " **Java, The Complete Reference** ", Tata McGrawHill, Eighth Edition, 2011.

Reference Books

1. Deitel .H.M and Deitel.P.J, " **Java: How to Program** ", Pearson Education Asia, International Sixth Edition 2004.

2. Lay.S & Horstmann Gary Cornell, " **Core Java Vol I** ", The Sun Microsystems & press Java Series, Seventh Edition, 2004.

3. Lay.S & Horstmann Gary Cornell, " **Core Java Vol II** ", The Sun Microsystems & press Java Series, Eighth Edition, 2008.

12I307 MICROPROCESSORS AND MICROCONTROLLERS LABORATORY

[Common to CSE & IT]

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LIST OF EXPERIMENTS

1. Programming with 8085 – 8-bit / 16-bit multiplication/division using repeated addition/subtraction and shifting & adding method

2. Programming with 8085-code conversion, decimal arithmetic, bit manipulations

3. Programming with 8085-matrix multiplication, floating point operations

4. Programming with 8086 – String manipulation, search, find and replace, copy operations, sorting (PC Required)

5. Interfacing with 8085/8086 – 8255 PPI

6. Interfacing with 8085/8086 – 8253 Timer

7. Interfacing with 8085/8086 – 8279 Keyboard display controller

8. Interfacing with 8085/8086 – 8251 Serial Interface

9. 8051 Microcontroller based experiments – Simple assembly language programs (cross assembler required)

10. 8051 Microcontroller based experiments – Simple control applications (cross assembler required)

TOTAL: 45

12I308 DATA STRUCTURES AND APPLICATIONS LABORATORY

[Common to CSE & IT]

(To be implemented in C++)

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1. String manipulators and pattern matching

2. Stack and Queue operations

3. Application of recursion

4. Linked list: Linear list, circularly linked list, Doubly linked list

5. Trees: Operations on binary tree

6. Conversion: Infix to polish, polish to code

7. Applications on graph.

8. Implementation of sorting technique

9. Implementation of searching techniques

10. Implementation of external searching techniques

11. Implementation of Automatic List Management

12. Implementation of Dynamic Memory Management

TOTAL: 45

12I401 PROBABILITY, RANDOM PROCESSES AND QUEUEING THEORY

[Common to CSE & IT]

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UNIT I PROBABILITY AND RANDOM VARIABLES (09)

Axioms of probability – continuous probability – Total probability – Baye's theorem - Random variables- Discrete and continuous random variables- Moments - Moment Generating Functions and their properties.

UNIT II STANDARD DISTRIBUTIONS (09)

Binomial, Poisson, Geometric, Uniform, Exponential, Gamma, Weibull and Normal distributions and their properties - Functions of a Random variable.

UNIT III TWO DIMENSIONAL RANDOM VARIABLES (09)

Joint distributions – Marginal Distributions – Conditional Distributions –Covariance –Correlation and Regression – Transformation of random variables – Central Limit theorem

UNIT IV RANDOM PROCESSES AND MARKOV CHAINS (0A9)

Definition and examples – first order, second order, strictly stationary, wide – sense stationery and ergodic processes – Markov process – Poisson processes – Birth and Death processes – Markov chains - Transition probabilities – Limiting distributions.

UNIT V QUEUEING THEORY (09)

 Markovian models – M/M/1 and M/M/c, finite and infinite capacity, M/M/'' queues – Finite source model – M/G/1 queue (steady state solutions only) – Pollaczek – Khintchine formula – special cases.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Book

   *T. Veerarajan, "**Probability Statistics and Random Process"** , Tata McGraw Hill   Publishing Company Ltd., New Delhi – 2007.*

Reference Books

*1. S. P. Gupta, "**Statistical Methods**", Sultan Chand & Sons, New Delhi – 2007.*

*2. K. S. Trivedi , "**Probability and Statistics with Reliability , Queuing and Computer Science Applications"** , Prentice Hall of India Ltd., New Delhi.*

*3. P. Kandasamy, K.Thilagavathy and K.Gunavathy, "**Probability and Random   Process"**,   S.Chand & Co. Ltd., New Delhi - 2003*

*4. S.C. Gupta and V. K. Kapoor, "**Fundamentals of Mathematical Statistics**", Sultan Chand & Sons,   New Delhi – Latest Edition 2009.*

*5. G.Haribaskaran, "**Probability, Queueing theory and Reliability Engineering"** , Lakshmi Publishers(P) Ltd(University science Press), New Delhi,   2006.*

12I402 ENVIRONMENTAL SCIENCE AND ENGINEERING

[Common to all branches]

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UNIT I ENVIRONMENTAL RESOURCES (09)

Earth structure, Internal and external earth processes, plate tectonics, erosion, weathering, deforestation, anomalous properties of water, hydrological cycle, effect of modern agriculture, fertilizers, pesticides, eutrophication, biomagnifications, land degradation, minerals, rocks, rock cycle, mining, types of mining, desertification, soil erosion, methods of conservation of soil erosion, renewable energy resources, wind, solar, geothermal, tidal, OTEC.

UNIT II ECO SYSTEM AND BIODIVERSITY (09)

Weather and climate, ocean current, upwelling, EL Nino, Ecology, ecosystem, biomes, physical and chemical components of ecosystem, biological components of ecosystem, forest ecosystem, desert ecosystem and pond ecosystem, Energy flow in ecosystem, nitrogen cycle, carbon dioxide cycle, phosphorous cycle, food pyramid, Ecological succession, types, biodiversity, need for biodiversity, values of biodiversity, hot spots of biodiversity, endangered and endemic species, conservation of biodiversity insitu-exitu conservation.

UNIT III ENVIRONMENTAL POLLUTION (09)

Air pollution, classification of air pollutants gaseous particulars, sources effects and control of gaseous pollutants SO_2, NO_2, H_2S, CO, CO_2 and particulates, control methods, cyclone separator, electrostatic precipitator, catalytic combustion-water pollution-classification of water pollutants, inorganic pollutants, sources, effects and control of heavy metals, organic pollutants, oxygen demanding wastes, aerobic and anaerobic decomposition, soil pollution, Noise pollution, sources, effects, decibel scale.

UNIT IV ENVIRONMENTAL THREATS (09)

Acid rain, green house effect, global warming, disaster management, flood, drought, earthquake, tsunami, threats to biodiversity, destruction of habitat, habit fragmentation- hunting, over exploitation – man- wildlife conflicts, The IUCN red list categories, status of threatened species.

UNIT V SOCIAL ISSUES AND ENVIRONMENT (09)

Sustainable development- sustainable technologies, need for energy and water conservation, rain water harvesting, water shed management, waste land reclamation, Air act, Wild life protection act, forest conservation act, population growth, exponential and logistic growth, variation in population among nations, population policy, women and child welfare programs, Role of information technology in human and health, HIV/AIDS, effects and preventive measures.

LECTURE: 45 TUTORIAL: 0 TOTAL: 60

Text Books

1. *Sharma J.P., '**Environmental Studies**', 3ʳᵈ Edn, University Science Press, New Delhi (2009)*

2. *Anubha Kaushik and C.P.Kaushik, '**Environmental Science and Engineering**', 3ʳᵈ Edn New age International Publishers, New Delhi (2008)*

Reference Books

1. *R.K.Trivedi, '**Hand book of Environmental laws, Rules, Guidelines, Compliances and Standards**', Vol.I &II, Environ Media.(2006)*

2. *G.Tyler Miller,J$_R$, '**Environmental Science**', Tenth Edition, Thomson BROOKS/COLE (2004)*

3. *Gilbert M.Masters, '**Introduction to Environmental Engineering and Science**', 2nd Edition Pearson Education (2004).*

12I403 DATA BASE SYSTEMS

[Common to CSE & IT]

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UNIT I INTRODUCTION AND CONCEPTUAL MODELING (09)

Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.

UNIT II RELATIONALMODEL (09)

SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependences and Normalization for Relational Databases (up to BCNF).

UNIT III DATA STORAGE AND QUERY PROCESSING (09)

Record storage and Primary file organization- Secondary storage Devices- Operations on Files- HeapFile- Sorted Files- Hashing Techniques – Index Structure for files –Different types of Indexes- B-Tree -B+Tree – Query Processing.

UNIT IV TRANSACTION MANAGEMENT (09)

Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control – Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging.

UNIT V CURRENT TRENDS (09)

 Object oriented databases-design of object oriented databases-data warehousing-data ware housing-data mining association rules-application of data mining -classification and prediction -XML-case studies.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

Abraham Silberschatz, Henry F. Korth and S. Sudarshan- **"Database System Concepts",** *Fourth   Edition, McGraw-Hill, 2002.*

Reference Books

1. *Ramez Elmasri and Shamkant B. Navathe,* **"Fundamental Database Systems**", *Third Edition, Pearson Education, 2003.*

2. *Raghu Ramakrishnan,* **"Database Management System"-** *3, Tata McGraw-Hill Publishing Company,2003.*

3. *Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom-* **"Database System Implementation**"- *Pearson Education- 2000.*

4. *Peter Rob and Corlos Coronel-* "**Database System, Design, Implementation and Management**", *Thompson Learning Course Technology- Fifth edition, 2003.*

12I404 COMPUTER ARCHITECTURE

[Common to CSE & IT]

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UNIT I   INTRODUCTION   (09)

Introduction – classes of computing- high -level language to language of hardware –safe place for data –chip manufacturing process – operation of computer hardware – operands of the computer hardware –instructions – Special-purpose instructions - Addressing modes - RISC vs CISC -supporting procedures in computer hardware –performance -CPU performance and its factors – evaluating performance .

UNIT II   DATA REPRESENTATION   (09)

Signed number representation, fixed and floating point representations, character representation. Computer arithmetic - integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication - shift-and-add, Booth multiplier, carry save multiplier, etc. Division - non-restoring and restoring techniques, floating point arithmetic.

UNIT III DESIGN OF CENTRAL PROCESSING UNIT (CPU)   (09)

Single-Cycle Datapath and Control- Multi-cycle Datapath and Control-Micro-programming and Hard-wired Control Units- Behavioral HDL Description of Systems- Exceptions Handling

UNIT IV PIPELINING   (09)

Intro to Pipelining; Pipelined MIPS Datapath- Pipeline Hazards: Structural, Control, Data-Hazard Detection and Resolution-Pipelining control- Exceptions Handling

UNIT V MEMORY SYSTEMS AND I/O INTERFACING   (09)

Overview of SRAM and DRAM Design- Memory Hierarchy;-Cache memory design - Virtual memory- Performance issues -I/O device characteristics - Buses and bus arbitration -Processor/OS interface –DMA.

LECTURE: 45 TUTORIAL:0 TOTAL: 45

Text Book

David. A. Patterson and John L. Hennessy, ***"Computer Organization and Design: The Hardware/Software Interface"****, Fourth Edition, Morgan-Kaufmann Publishers Inc. 2009*

Reference Books

1. Carl Hamachar, Zvonco Vranesic and Safwat Zaky, *"****Computer Organization"****, McGraw Hill.*

2. John P.Hayes, " ***Computer Architecture and Organization*** *" Mc-Graw Hill International, Third Edition, 1998.*

*3. William Stallings,"****Computer Organization and Architecture: Designing for Performance"****, Pearson Education.*

*4. Morris Mano.M," ****Computer system architecture"****,PHI publication, 3rd edition,2008.*

12I405 SYSTEMS PROGRAMMING AND OPERATING SYSTEMS

[Common to CSE & IT]

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UNIT I SYSTEM PROGRAMMING   (09)

Assemblers: Elements of Assembly Language Programming, A simple Assembly scheme, Pass structure of assemblers, design of a two pass assemblers, A single pass assembler for IBM PC, Macros and Macro processors: Macro definition and call, Macro Expansion, Nested macro calls, Advanced macro facilities, Design of a macro preprocessor, Linkers: relocation and linking concepts, Design of a linker, self-relocating programs, Linker for MS DOS, Linking for overlays, Loaders, software Tools: software tools for program development, editors, debug monitors, programming environments.

OPERATING SYSTEMS

UNIT II PROCESS MANAGEMENT   (09)

Introduction to operating systems - Process management: Process concepts, Scheduling criteria – Scheduling algorithms – Thread scheduling – Multiple-processor scheduling – Operating system examples – Algorithm Evaluation – The critical-section problem – Peterson's solution –Synchronization hardware – Semaphores – Classic problems of synchronization– Critical regions – Monitors – Synchronization examples – Deadlocks – System model – Deadlock characterization – Methods for handling deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock detection – Recovery from deadlock.

UNIT III STORAGE MANAGEMENT   (09)

Memory Management – Swapping – Contiguous memory allocation – Paging – Segmentation – Example: The Intel Pentium - Virtual Memory: Background – Demand paging – Copy on write – Page replacement – Allocation of frames – Thrashing**.**

UNIT IV I/O SYSTEMS   (09)

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

UNIT V CASE STUDIES   (09)

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 7 – History – Design Principles – System Components – Terminal Services and Fast User – File system – Networking.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Books

1. *Dhamdhere.D.M, "**System Programming & Operating Systems** ", Second edition, Tata Mc-Graw Hill, 2008.*

2. *Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "**Operating System Concepts Essentials**", John Wiley & Sons Inc., 2010.*

Reference Books

1. *Andrew S. Tanenbaum, "**Modern Operating Systems**", Third edition, PHI learning private limited, 2011.*

2. *Deitel.H.M, "**Operating Systems** ", Second edition, Pearson Education Asia, 2002**.***

3. *Leland L.Beck "**System Software – An Introduction to Systems Programming**", Pearson education, Third edition 2005.*

12I406 THEORY OF COMPUTATION

[Common to CSE & IT]

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UNIT I REGULAR EXPRESSION AND FINITE AUTOMATA (09)

Regular Languages and Regular Expressions - Memory Required to Recognize a Language -Finite Automata - Distinguishing One String from Another - Unions, Intersections, and Complements.

NONDETERMINISM AND KLEENE'S THEOREM, REGULAR AND NONREGULAR LANGUAGES

Nondeterministic Finite Automata - Nondeterministic Finite Automata with Λ-transitions -Kleene's Theorem. Criterion for Regularity- Minimal Finite Automata-Pumping Lemma for Regular Languages-Decision Problems- Regular Languages and Computers.

UNIT II CONTEXT FREE GRAMMARS, CONTEXT FREE AND NON CONTEXT FREE LANGUAGES (09)

Examples and Definitions - Regular Grammars - Derivations and Ambiguity - Unambiguous CFG for Algebraic Expression - Simplified Forms and Normal Forms. Pumping Lemma and Context Free Languages-Intersections and Complements of Context Free Languages- Decisions Problems.

PUSHDOWN AUTOMATA

Introduction- Definition- Deterministic Pushdown Automata – PDA corresponding to a Given CFG-CFG Corresponding to a Given PDA- parsing.

UNIT III TURING MACHINES (09)

Definitions and Examples- Computing Partial Functions with Turing Machines – Combining Turing Machines-Variations of Turing Machines with Multitape TMs-Nondeterministic Turing Machines-Universal Turing Machines-Models of Computations and the Church Turing Thesis.

RECURSIVELY ENUMERABLE LANGUAGES

Recursively Enumerable and Recursive-Enumerating a Language –More General Grammars- Context –Sensitive Languages and the Chomsky hierarchy- Not all Languages and Recursively Enumerable.

UNIT IV UNSOLVABLE PROBLEM (09)

Non recursive Language and an Unsolvable Problems-Reducing One Problem to Another: The Halting Problem-Other Unsolvable Problems Involving TMs-Rice's Theorem and More Unsolvable Problems-Post's Correspondence Problems-Unsolvable problems Involving Context-Free Languages.

COMPUTABLE FUNCTIONS

Primitive Recursive Functions-Primitive Recursive Predicates and Some Bounded Operations-unbounded Minimalizations and μ -Recursive Functions-Global Numbering-All Computable Functions Are μ -Recursive- nonnumeric Functions, and Other Approaches to Computability.

UNIT V MEASURING AND CLASSIFYING COMPLEXITY, TRACTABLE AND INTRACTABLE PROBLEMS   (09)

Growth rates of Functions-Time and Space Complexity of a Turing Machines-Complexity Classes. Tractable and Possibly Intractable Problems:P and NP-Polynomial Time Reductions and NP Completeness-Cook's Theorem- Other NP Complete Problems.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Book

John C. Martin, "**Introduction to Languages and the Theory of Computation**", *Third Edition,   Tata McGraw-Hill Publishing Company Limited, New Delhi,   2004.*

Reference Books

1. *John E. Hopcroft, Rajeev Motwani, Jeffey D. Ullman,* "**Introduction to Automata Theory Languages, and Computations**", *Pearson Education Asia, 2002.*

2. *Mishra K L B and Chandrasekaran N,* "**Theory of Computer Science, Automata Languages and Computation**", *Prentice – Hall of India Pvt. Ltd., 1993.*

12I407 DATABASE SYSTEMS LABORATORY

[Common to CSE & IT]

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1. Data Definition Language (DDL)

2. Data Manipulation Language (DML)

3. Queries in SQL.

4. Simple Views Vs Complex views

5. High level programming language extensions.

6. Front end tools.

7. Forms-Payroll processing systems.

8. Triggers.

9. Menu Design.

10. Reports-Banking system.

11. Aggregate Functions.

12. Mini Project

TOTAL: 45

12I408 SYSTEMS PROGRAMMING AND OPERATING SYSTEMS LABORATORY

[Common to CSE & IT]

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LIST OF EXPERIMENTS

SYSTEM PROGRAMMING

To be Implemented in C Language

1. Design of single pass assembler.
2. Design of two pass assembler.
3. Simulation of Static and Dynamic Linker.
4. Implementation of Relocation Loader.
5. Design of MASM Macroprocessor.

OPERATING SYSTEMS

1. Implementation of Process Scheduling.
2. Illustrated of Inter Process Communication Strategies.
3. Implementation of Mutual exclusion by Semaphores.
4. Deadlock Prevention & Avoidance Algorithms.
5. Virtual Memory: Paging and Segmentation.
6. Implementation of Page Replacement Algorithms.
7. Implementation of File structure.

TOTAL: 45

12I501 OBJECT ORIENTED ANALYSIS AND DESIGN

[Common to CSE & IT]

L T P C

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UNIT I OBJECT ORIENTED DESIGN FUNDAMENTALS (09)

Review of Object Oriented system – Design objects – class hierarchy – Polymorphism – Object relationship –Association –Object persistence – metaclass – Object Oriented Systems development life cycle –Object oriented methodologies– Rumbaugh–Booch–Jacobson.

UNIT II UNIFIED MODELING LANGUAGE (09)

The Unified Approach– Object oriented Analysis–Design –Iterative Development–Continuous Testing–Proposed Repository–Layered Approach – Unified Modeling Language–Static –Dynamic Models–UML Diagrams –UML Class Diagrams–Dynamic Modeling– packages–UML Extensibility –Meta Model.

UNIT III ANALYSIS AND DESIGN (09)

System Conception – Elaborating – Domain Analysis–Class Model–State Model–Interaction Model–Application Analysis– Interaction Model–Class Model–State Model–System Design–Performance–Concurrency–Subsystems–Data Storage– Boundary conditions–Architectural styles– Class Design– Realizing Use cases– Recursing Downward– Refactoring– Design Optimization.

UNIT IV IMPLEMENTATION MODELING (09)

Fine tuning classes–Fine tuning Generalizations–Realizing Associations–Testing–OO languages–Implementing Structure– Implementing Functionality–Programming Style–Object Oriented Style–Reusability–Extensibility–Robustness.

UNIT V SOFTWARE ENGINEERING (09)

Iterative Development– Iteration Scope– Performing an Iteration– Identifying Risks–Managing Model–models –Modeling sessions–Learning –Teaching –Techniques–Legacy Systems–Reverse Engineering–Building Class Model–Interaction Model–State Model–Wrapping –Maintenance   .

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Books

1. Ali Bahrami , **"Object Oriented System Development"**, *McGraw Hill International Edition, 1999.(Unit I & II)*

2. Michael Blaha and James Rumbaugh, **"Object-oriented modeling and design with UML"**, *Pearson Education 2005. (Unit III, IV & V).*

Reference Books

1. Booch, Grady, **"Object Oriented Analysis and Design"**, *2nd ed. Pearson Education.2000.*

2. O'Docherty, Mike, **"Object-Oriented Analysis & Design"**, *Wiley. 2005.*

3. Mahesh P.Matha, **"Object Oriented Analysis and Design Using UML"**, *PHI,2010.*

12I502 INFORMATION CODING TECHNIQUES

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UNIT I INFORMATION THEORY (09)

Introduction, Uncertainty, Information and Entropy, Joint and Conditional Entropy, Mutual Information ,Channel capacity theorem, Continuous and Discrete Communication Channels – Discrete Memory less Channels- Channel representations-Noiseless Channel, Lossless Channels, Deterministic, Binary Symmetric Channel (BSC), Binary Erasure Channel (BEC) and their capacities

UNIT II SOURCE CODING TECHNIQUES (09)

Coding for Discrete memory less sources: Fixed length code words, variable length code words, Kraft Inequality, Prefix Coding, Shannon's First, Second and third theorem, Shannon binary Encoding, Shannon-Fano Encoding, Huffman Coding: Minimum and Maximum Variance Method

UNIT III ERROR CONTROL CODING (09)

Types Errors, Types of Codes, Linear Block Codes: Error Detection and Error Correction capabilities of Linear Block Codes, Binary Cyclic Codes, Encoding using Shift Register, Syndrome Calculation, Error Detection and Correction, Convolutional Codes-Encoder and Decoders for Convolutional Codes, Viterbi decoding

UNIT IV COMPRESSION TECHNIQUES (09)

Principles – Text compression – Static Huffman Coding – Dynamic Huffman Coding, Arithmetic Coding – Image Compression – Graphics Interchange Format – Digitized Documents – Introduction to JPEG Standards.

UNIT V AUDIO AND VIDEO CODING (09)

Linear Predictive Coding- Code excited LPC- Perceptual Coding, MPEG audio coders, Dolby audio coders – Video compression – principles – Introduction to H.261 and MPEG video standards.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Books

1. *Simon Haykin, " Communication Systems", John Wiley and Sons, 2009.*

2. *Fred Halsall, "Multimedia Communications", Applications Networks Protocols & Standards", Pearson education, Asia 2002; Chapters: 3,4,5*

Reference Books

1. *Ranjan Bose,"Information Theory, Coding and Cryptography", Tata McGrew Hill, 2nd Edition, 2010.*

2. *S.P. Eugene Xavier, "Statistical Theory of Communication" New Age International , 2005.*

3. *K. Sam Shanmugam, " Digital and Analog Communication Systems", John Wiley and Sons, 2010.*

12I503 WEB TECHNOLOGY

[Common to CSE & IT]

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UNIT I INTRODUCTION (09)

Introduction To Internet – Principles- Basic Web Concepts – World Wide Web- Web Servers –Web Browsers – URL-MIME – HTTP –SGML- Internet Protocols And Standards.

UNIT II COMMON GATEWAY INTERFACE PROGRAMMING (09)

HTML Forms – CGI Concepts – HTML Tags Emulation – Server – Browser Communication – E-Mail Generation– CGI Client Side Applets – CGI Server Applets – Authorization And Security. Introduction To PERL.

UNIT III SCRIPTING LANGUAGES (09)

Java Script Programming-Dynamic HTML-Cascading Style Sheets-Object Model And Event Model- Filters And Transitions-Active X Controls-Multimedia-Client Side Script.- VB Script Programming – Forms – Scripting Object.

UNIT IV SERVER SIDE SCRIPTING (09)

Server Side Scripting _Servlets_Java Server Pages – Session Management – Cookies – Database Access Through Web – SQL –Architecture For Database- System.

UNIT V ON-LINE APPLICATIONS (09)

E-Commerce –Business Models For E-Commerce-Enabling Technologies Of The World Wide Web- E-Marketing-E-Security-E-Payment Systems-E-Customer Relationship Management.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Books

1. *Deital and Deital, Goldberg, "Internet & World Wide Web, How To Program", third edition, Pearson Education, 2004.*

2. *P.T.Joseph, S.J, "E-Commerce, An Indian perspective, 4th edition.*

Reference Books

1. *1 Deitel and Deitel, "Java – How to program", 9th ed.,PHI,2012.*

2. *Jeffy Dwight, Michael Erwin and Robert Niles, "Using CGI", Prentice Hall of India QUE, 1999.*

3. *Robert W. Sebesta,"Programming the World Wide Web", 3rd ed.,Pearsonpublication.*

4. *Chris Bates, "Web Programming", 3rd ed., Wiley, 2006.*

5. *W Clay Richardson, et al, "Professional Java JDK 6 Edition", Wrox, 2007.*

12I504   COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS
[Common to CSE & IT]

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UNIT I OUTPUT PRIMITIVES   (09)

Introduction - Line - Curve And Ellipse Drawing Algorithms – Attributes – Two-Dimensional Geometric Transformations – Two-Dimensional Clipping And Viewing.

UNIT II THREE-DIMENSIONAL CONCEPTS   (09)

Three-Dimensional Object Representations – Three-Dimensional Geometric And Modeling Transformations – Three-Dimensional Viewing – Color Models – Animation.

UNIT III MULTIMEDIA SYSTEMS DESIGN   (09)

 An Introduction – Multimedia Elements – Multimedia Applications – Multimedia Systems Architecture – Evolving Technologies For Multimedia – Defining Objects For Multimedia Systems – Multimedia Data Interface Standards – Need For Data Compression - Multimedia Databases. Compression And Decompression: Types Of Compression – Binary Image Compression Schemes – Color, Gray Scale And Still – Video Image Compression - Audio Compression – Fractal Compression.

UNIT IV MULTIMEDIA INPUT/OUTPUT TECHNOLOGIES   (09)

Key Technology Issues – Pen Input – Video And Image Display Systems – Print Output Technologies – Image Scanners - Digital Voice And Audio – Digital Camera - Video Images And Animation – Full-Motion Video. Storage And Retrieval Technologies: Magnetic Media Technology – Optical Media – Hierarchical Storage Management – Cache Management For Storage Systems.

UNIT V MULTIMEDIA APPLICATION DESIGN   (09)

Multimedia Application Classes – Types Of Multimedia Systems – Virtual Reality Design – Components Of Multimedia Systems – Organizing Multimedia Databases – Application Workflow Design Issues – Distributed Application Design Issues.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Books

1. *Donald Hearn and M.Pauline Baker, "**Computer Graphics C Version"**, Pearson Education, 2003. [Unit I : Chapters 1 to 6; Unit II: Chapter 9 – 12, 15, 16)*

2. *Prabhat K Andleigh and Kiran Thakrar, "**Multimedia Systems and Design"**, PHI, 2003. ISBN: 81-203-2177-4. [Unit III, IV & V]*

Reference Books

1. *Pakhira, "**Computer Graphics, Multimedia and Animation"**,2 nd Edition,PHI 2010*

2. *Tay Vaughan, **Multimedia Making it work,**Fourth Edition, Tata McGraw-Hill. ISBN: 0- 07-463953-6.*

3. *Ze-Nain Li, Mark S.Drew, " **Fundamentals of Multimedia"**, PHI. ISBN :81-203-2817-5.*

4. *John F. Koegel Buford, " **Multimedia Systems"**, Third Edition, 2000. ISBN: 8177588273.*

5. *Judith Jeffcoate**, "Multimedia in practice technology and Applications"**, PHI, 1998.*

6. *Foley, Vandam, Feiner, Huges, "**Computer Graphics: Principles & Practice"**, Pearson Education, second edition 2003.*

12I505 DESIGN AND ANALYSIS OF ALGORITHMS

[Common to CSE & IT]

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UNIT I INTRODUCTION (09)

Asymptotic complexity Some stylistic issues Analysis of Algorithms - Principles of Algorithm Design - Finding Maximum and Minimum - Amortized analysis- Graph Algorithms- Shortest path,-Flow networks

UNIT II ALGORITHMS (09)

Numerical algorithms – integer - matrix and polynomial multiplication – FFT - extended Euclid's algorithm - modular exponentiation - primality testing - cryptographic computations- Internet algorithms-text pattern matching - tries, information retrieval - data compression -Web caching- Geometric algorithms -range searching - convex hulls- segment intersections-closest pairs.

UNIT III DIVIDE AND CONQUER AND DYNAMIC PROGRAMMING (09)

Introduction - Sorting - Median Finding - Combinatorial Search – Knapsack - Longest common subsequence - Matrix chain multiplication or Optimal search trees - A machine scheduling problem

UNIT IV ALGORITHM DESIGN (09)

Introduction - Applications- job sequencing with deadlines - minimum cost spanning trees- single source shortest path problem -Set of Intervals - Fractional Knapsack - Huffman Coding - Branch-and-bound – Backtracking - Approximation algorithms-Randomized algorithms

UNIT V NP-COMPLETENESS (09)

Matching - Introduction to NP-Complete - Search/Decision – SAT – Independent Set - Exact Cover - Multi Set - Subset Sum & Partition - Hamiltonian Circuit

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Books

1. *Thomas H Cormen, Charles E Lieserson, Ronald L Rivest and Clifford Stein, "**Introduction to Algorithms**", Second Edition, MIT Press/McGraw-Hill, 2001.*

2. *Michael T Goodrich and Roberto Tamassia, "**Algorithm Design: Foundations, Analysis, and Internet "** Examples, Second Edition, Wiley, 2006.*

Reference Books

1. *Udi Manber, "**Algorithms — A Creative Approach**" , Addison-Wesley, Reading, MA, 1989.*

2. *Mark de Berg, Mark van Kreveld, Mark Overmars and Otfried Shwarzkopf (Cheong), "**Computational Geometry: Algorithms and Applications**" , Third edition, Springer-Verlag, 2008.*

3. *Jon Kleinberg and Éva Tardos, "**Algorithm Design**", Pearson, 2005.*

4. *Sara Baase, Allen Van Gelder, **"Computer Algorithms: Introduction to design and analysis",** Pearson Education, Third Edition.*

12I506 COMPUTER NETWORKS

[Common to CSE & IT]

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UNIT I INTRODUCTION AND PHYSICAL LAYER (09)

Motivation-Goals of networking-Need for a layered architecture,Network hardware- Network software -Reference models - Network standardization, RS-232 over serial line - Guided Transmission media - Wireless transmission media.

UNIT II THE DATA LINK LAYER (09)

The Data Link Layer: Data link layer design issues – services provided to the network layer, Framing –Flow and error control :Error detection and correction -Elementary data link protocols – A simplex stop and wait protocol –stop and wait ARQ-Sliding window protocols, piggy backing - MAC protocols - Ethernet – FDDI-Bridges.

UNIT III THE NETWORK LAYER (09)

Network layer design issues –Switching techniques, IP addressing modes- Subnetting- Routing algorithms: Flooding, Distance vector and Link state routing, Hierarchical routing, Multicasting and broadcasting - Congestion control algorithms -Internetworking.

UNIT IV THE TRANSPORT LAYER (09)

Duties of Transport layer- Multiplexing -Demultiplexing-Congestion control, Simple transport protocol - Internet transport protocols UDP, TCP- ATM protocols.

UNIT V THE APPLICATION LAYER (09)

omain name system - SMTP,FTP, HTTP - Electronic mail - World Wide Web - Multimedia - Network Security.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

Behrouz A.Ferouzan,"Data Communications and Networking", Tata McGraw-Hill, 2010.

Reference Books

1. *Andrew S. Tanenbaum, "Computer networks" , PHI, 4th edition 2008.*

2. *Larry L. Peterson and Bruce S. Davie, "Computer Networks, A Systems Approach", Second Edition. Morgan Kaufmann Publishers Inc, 2000.*

3. *William Stallings, "Data and computer communication", PHI, 2001.*

4. *Douglas E. comer, "Internetworking with TCP/IP-Volume-I", PHI, 1997.*

12I507 WEB TECHNOLOGY LABORATORY

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LIST OF EXPERIMENTS

1. Create a web page with the following using HTML

    i.   To embed an image map in a web page.

    ii.   To fix the hot spots.

    iii. Show all the related information when the hot spots are clicked.

2. Create a web page with all types of Cascading style sheets.

3. Client Side Scripts for Validating Web Form Controls using DHTML.

4. Write programs in Java to create applets incorporating the following features:

    i.   Create a color palette with matrix of buttons

    ii.   Set background and foreground of the control text area by selecting a color from color palette.

5. Write programs in Java using Servlets:

    i.   To invoke servlets from HTML forms.

    ii.   To invoke servlets from Applets.

6. Write programs in Java to create three-tier applications using JSP and Databases for conducting

    i.   on-line examination.

    ii.   for displaying student mark list.

Assume that the student information is available in a database which has been stored in a database server.

7. Programs using XML – Schema – XSLT/XSL.

8. Program using DOM / SAX.

9. Programs using AJAX.

10. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base.

11. Case study: Search engines

12. Mini Project

TOTAL: 45

12I508 NETWORKING LABORATORY

[Common to CSE & IT]

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LIST OF EXPERIMENTS

1.   Programs using TCP Sockets (like date and time server & client, echo server & client, etc.).

2.   Programs using UDP Sockets (like simple DNS) .

3.   Packet sniffing using WIRESHARK application.

4.   Programs using Raw sockets (like packet capturing and filtering).

5.   Programs using RPC.

6.   LEACH protocol simulation using ns2.

7.   Performance comparison of MAC protocols.

8.   LAN simulation using ns2.

9.   Measuring network performance using ns2.

10.   Simulating a MANET using ns2

11.   Study of UDP performance.

12.   Study of   TCP performance.

TOTAL: 45

12I601 EMBEDDED SYSTEM DESIGN

[*Common to CSE & IT*]

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UNIT I INTRODUCTION TO EMBEDDED SYSTEMS (09)

Review of microcontrollers and Digital Signal Processors (DSP) – architecture - peripheral modules. Embedded microcontroller cores (ARM, RISC, CISC, SOC) - addressing modes - interrupts structure - hardware multiplier pipelining. Hardware/Software co-design - Architecture of embedded systems.

UNIT II EMBEDDED SOFTWARE DEVELOPMENT (09)

Assemblers, linkers and loaders - Binary file formats for processor executable files - Typical structure of timer-interrupt driven programs - GNU-GCC compiler introduction - programming with Linux environment and GNU debugging - GNU insight with step level trace debugging, make file interaction, building and execution.

UNIT III DESIGN WITH ARM PROCESSOR (09)

Introduction to ARM instruction set - addressing modes - operating modes with ARM core - ARMTDMI modes - ADC, Timers, Interrupt structure - Byte ordering (LE, BE) - Thumb mode normal mode instructions changes, Pipeline utilization with all register allocations. Compare with ARM7, ARM9, and ARM11 with new features additions - System design with ARM processor.

UNIT IV INPUT / OUTPUT INTERFACING (09)

Interfacing with switches, keyboards, LED's, LCD's, transistors used for digital controlled current switches, digital-controlled relays, solenoids, DC, AC and stepper motors, analog interfacing and data acquisition systems.

UNIT V REAL-TIME OPERATING SYSTEM (09)

Real Time Operating System Concepts, Kernel Structure, Critical Sections, Multitasking, Task Management, Time Management, Schedulers, Event Control Blocks, Priorities, Deadlocks, Synchronization, Semaphore Management, Mutual Exclusion, Message Mailbox Management, Message Queue Management, Memory Management, RTOS implementation. Examples of OSs for embedded systems – RT Linux, uC/OS.

LECTURE: 45, TUTORIAL: 0, TOTAL: 45

Text Books

1. *"Embedded / Real-Time Systems: Concepts, Design & Programming"* – *Dr. K. V.. K. Prasad – Dreamtech Press, New Delhi, 2009.*

2. *"ARM System Developer's Guide Designing and Optimizing System Software"* – *Andrew N. Sloss, Dominic Sysmes and Chris Wright – Morgan Kaufman Publisher, 2004*

Reference Books

1. *"An Embedded Software Primer"* – *David E. Simon – Pearson Education South Asia, 2001*

2. *"Embedded Microcomputer Systems Real Time Interfacing"* - *Jonathan W. Valvano – Thomson Asia Pte Ltd., 2006*

3. *"Embedded Linux : Hardware, Software and Interfacing"* – *Hollabaugh, Pearson Education 2002*

4. *"Embedded Realtime Systems Programming"* - *Sriram V Iyer, Pankaj Gupta – TMH, 2004*

12I602 DISTRIBUTED COMPUTING

[Common to CSE & IT]

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UNIT I CHARACTERIZATION OF DISTRIBUTED SYSTEMS   (09)

Introduction – examples of distributed systems – resource sharing and the web – challenges. System Model: introduction – architectural models – fundamental models. Inter process Communication: introduction – the API for the Internet protocol – external data representation and marshaling – client –server communication – group communication.

UNIT II DISTRIBUTED OBJECTS AND REMOTE INVOCATION   (09)

Introduction – Communication Between Distributed Objects – RPC – Events And Notifications. Operating System Support: Introduction – The Operating System Layer – Protection – Process And Threads – Communication And Invocation - Operating System Architecture. Distributed File Systems: Introduction – File Service Architecture – Sun Network File System

UNIT III NAME SERVICES   (09)

Introduction – Name Services And The DNS – Directory And Discovery Services. Time And Global States: Introduction – Clock, Events And Process States – Synchronizing Physical Clocks – Logical Time And Logical Clocks – Global States – Distributed Debugging. Co-Ordination And Agreement: Introduction – Distributed Mutual Exclusion – Elections – Multicast Communication

UNIT IV TRANSACTIONS AND CONCURRENCY CONTROL   (09)

Introduction – Transactions – Nested Transaction – Locks – Optimistic Concurrency Control – Timestamp Ordering – Comparison Of Methods For Concurrency Control. Distributed Transactions: Introduction – Flat And Nested Distributed Transactions – Atomic Commit Protocols – Concurrency Control In Distributed Transactions – Distributed Deadlocks – Transaction Recovery.

UNIT V REPLICATION   (09)

Introduction – System Model And Group Communication – Fault Tolerant Services – Highly Available Services – Transactions With Replicate Data. Distributed Shared Memory: Introduction – Design And Implementation Issues – Sequential Consistency And Ivy – Release Consistency And Munin. Distributed Multimedia Systems: Introduction – Characteristics Of Multimedia Data – Quality Of Service Management – Resource Management – Stream Adaptation.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

*George Coulouris, Jean Dollimore, Tim Kindberg, "**Distributed Systems – Concepts and Design"**, Third Edition, Pearson Education, 2001. (Chapters 1, 2, 4-6, 8-16, Case Studies are not included)*

Reference Books

1. *Andrew S. Tanenbaum, Maartenvan Steen, "**Distributed Systems – Principles and Paradigms"**, Pearson Education, 2002.*

2. *Mukesh Singhal, Niranjan G.Shivaratri, "**Advanced Concepts in Operating Systems: Distributed, Database, and Multiprocessor Operating Systems"**, Tata McGraw-Hill, 2000.*

12I603 INFORMATION STORAGE MANAGEMENT

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UNIT I INTRODUCTION TO STORAGE TECHNOLOGY (09)

Data proliferation evolution of various storage technologies, Overview of storage infrastructure components Information Lifecycle Management, Data categorization.

UNIT-II STORAGE SYSTEMS ARCHITECTURE (09)

Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components,properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

UNIT-III INTRODUCTION TO NETWORKED STORAGE (09)

JBOD,DAS, NAS, SAN & CAS evolution and comparison. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

UNIT –IV HYBRID STORAGE SOLUTIONS (09)

Virtualization - Memory, network, server, storage &appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM), standard framework applications, Key management metrics (Thresholds, availability, capacity, security, performance).

UNIT-V INFORMATION STORAGE ON CLOUD (09)

Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Books

1. *G. Somasundaram & Alok Shrivastava (EMC Education Services) , **"Information Storage and Management: Storing, Managing, and Protecting Digital Information",** Wiley India 2009.*

2. *Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein, **"StorageNetwork Explained : Basics and application of fiber channel SAN, NAS, iSESI, INFINIBAND and FCoE",** Wiley India., 2009*

Reference Books

1. *John W. Rittinghouse and James F. Ransome, **"Cloud Computing : Implementation , Management and Security",** CRC Press, Taylor Frances Pub, 2009*

2. *Nick Antonopoulos, Lee Gillam,**"Cloud Computing : Principles, System & Application",** Springer, 2010*

3. *Saurabh , **"Cloud Computing : Insight into New Era Infrastructure"**, Wiley India 2011*

<div align="center">**12I604 E- COMMERCE**</div>

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UNIT I INTRODUCTION (09)

Electronic Commerce Framework-Electronic Commerce and Media Convergence-The Anatomy of E-Commerce Applications-Electronic Commerce Consumer Applications-Electronic Commerce Organization Applications. The Network Infrastructure for Electronic Commerce: Market Forces Influencing the I-Way- Components of the I-Way- Network Access Equipment-The Last Mile: Local Roads and Access Ramps-Global Information Distribution Networks-Public Policy Issues Shaping the I-Way.

UNIT II INTERNET AS A NETWORK INFRASTRUCTURE (09)

The Internet as a Network Infrastructure: The Internet Terminology-Chronological History of the Internet-NSFNET:Architecture and Components-National Research and Education Network-Globalization of the Academic Internet-Internet Governance:The Internet Society-An Overview of Internet Applications. The Business of the Internet Commercialization: Telco/Cable/On-Line Companies-National Independent ISPs-Regional-Level ISPs -Local-Level ISPs -Service Providers Abroad-Service Provider Connectivity:Network Interconnection Points-Internet Connectivity Options-Logistics of Being an Internet Service Provider.

UNIT III NETWORK SECURITY AND FIREWALLS (09)

Client-Server Network Security -Emerging Client-Server Security Threats-Firewalls and Network Security-Data and Message Security-Challenge Response Systems-Encrypted Documents and Electronic Mail-U.S.Government Regulations and Encryption. Electronic Commerce and World Wide Web: Architectural Framework for Electronic Commerce-World Wide Web(WWW)as the Architecture-Web Background:Hypertext Publishing-Technology behind the Web-Security and the Web.

UNIT IV CONSUMER-ORIENTED ELECTRONIC COMMERCE (09)

Consumer-Oriented Applications-Mercantile Process Models-Mercantile models from the Consumer's Perspective-Mercantile Models from the Merchant's Perspective. Electronic Payment Systems: Types of Electronic Payment Systems-Digital Token-Based Electronic Payment Systems-Smart Cards and Electronic Payment Systems-Credit Card-Based Electronic Payment Systems-Risk and Electronic Payment Systems-Designing Electronic Payment Systems.

UNIT V EDI,VAN & MANAGEMENT (09)

Interorganizational Commerce and EDI: Electronic Data Interchange-EDI applications in Business-EDI:Legal,Security,and Privacy Issues-EDI and Electronic Commerce. EDI Implementation ,MIME,and Value-Added Networks: Standardization and EDI -EDI Software Implementation- EDI Envelope for Message Transport- Value-Added Networks(VANs) -Internet-Based EDI. Intraorganizational Electronic Commerce: Internal Information Systems-Macroforces and Internal Commerce-Work-Flow Automation and Coordination-Customization and Internal Commerce-Supply Chain Management(SCM).

<div align="right">**LECTURE: 45 TUTORIAL: 0 TOTAL: 45**</div>

Text Book

   Ravi Kalakota and Andrew B.Whinston, "**Frontiers of Electronic   Commerce**", *Pearson Education Asia,2002.*

Reference Books

*1. Efraim Turvan J.Lee, David kug and chung, "**Electronic commerce**", Pearson education Asia, 2001.*

*2. Brenda Kienew, "**E commerce Business**", Pearson Education Asia ,2001.*

12I605 FUNDAMENTALS OF DIGITAL SIGNAL PROCESSING

[Common to CSE & IT]

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UNIT I SIGNALS AND SYSTEMS (09)

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

UNIT II FAST FOURIER TRANSFORMS (09)

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

UNIT III IIR FILTER DESIGN (09)

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

UNIT IV FIR FILTER DESIGN (09)

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

UNIT V FINITE WORD LENGTH EFFECTS (09)

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

LECTURE: 45 TUTORIAL: 15 TOTAL : 60

Text Book

John G Proakis and Dimtris G Manolakis, *"Digital Signal Processing Principles - Algorithms and Application"*, *Third Edition, PHI/Pearson Education, 2000.*

Reference Books

1. *Alan V Oppenheim, Ronald W Schafer and John R Buck, "Discrete Time Signal Processing",Second Edition, PHI/Pearson Education, 2000.*

2. *Johny R.Johnson, "Introduction to Digital Signal Processing", Prentice Hall of India/Pearson Education, 2002.*

3. *Sanjit K.Mitra, "Digital Signal Processing A Computer - Based Approach", Second Edition, Tata McGraw-Hill, 2001.*

12I607 COMMUNICATION LABORATORY

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1. Amplitude Modulation and Demodulation

2. Frequency modulation and Demodulation

3. Pulse modulation and Demodulation

4. Sampling

5. Time Division Multiplexing

6. Pulse Code Modulation

7. Line Coding and Decoding-Manchester Ami

8. FSK Modulation and Demodulation

9. PSk modulation and Demodulation

10. Experiments with Fibre optics Communication Kit

11. Experiments with Communication Simulation Software

12. Mini Project

TOTAL: 45

12I608 GRAPHICS AND MULTIMEDIA LABORATORY

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EXPERIMENTS O ILLUSTRATE THE FOLLOWING

1. Line drawing algorithm

2. Circle drawing algorithm

3. Ellipse drawing algorithm

4. 2D transformations

5. 2D clipping and viewing

6. 3D transformations

7. 3D clipping and viewing

8. Data compression and Image compression

9. Audio and video compression

10. Animation

11. Case study: Multimedia software

12. Mini project

TOTAL : 45

12I701 MANAGEMENT INFORMATION SYSTEM

L T P C

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UNIT I FOUNDATIONS OF INFORMATION SYSTEMS, INFORMATION TECHNOLOGIES (09)

Foundation Concepts: Information systems in business - Components of Information Systems - Competing with Information Technology: Fundamental of strategic advantage - Using information technology for strategic Advantage. – Data Resource Management: Managing Data resources – Technical Foundations of Database management - Telecommunication and Networks: The networked enterprise – Telecommunications network alternatives.

UNIT II BUSINESS APPLICATIONS (09)

Electronic business systems: enterprise business systems – functional business systems. Enterprise business systems: Customer relationship Management - Enterprise Resource Planning: ERP - Supply Chain Management.

UNIT III BUSINESS APPLICATIONS (09)

Electronic Commerce System: E-Commerce Fundamentals - E-Commerce Applications and issues - Decision Support Systems - Artificial Intelligence Technologies in Business.

UNIT IV DEVELOPMENT PROCESSES (09)

IT Strategies: Introduction - Planning fundamentals - Implementation Challenges - IT Solutions - Developing business systems - Implementing business systems.

UNIT V MANAGEMENT (09)

Security and Ethical Challenges - Ethical responsibility of business professionals - Security management of Information Technology - Enterprise and global management of Information Technology - Managing the IS function - Managing global IT

LECTURE : 45, TUTORIAL :0, TOTAL : 45

Text Book

.   James A O'Brien,George M Marakas, *"**Management Information Systems**"*, *Seventh Edition, Tata McGraw-Hill, 2008.*

Reference Books

1. *Gordon .B. Davis and Margerethe H. Olson, **"Management Information System"**, McGraw Hill 1998.*

2. *W.S. Jawadekar, **"Management Information Systems"***, *Tata McGraw Hill publishing Company Limited, Third Edition, 2006.*

12I702   CRYPTOGRAPHY AND NETWORK SECURITY

L T P C

3 0 0 3

UNIT I INTRODUCTION (09)

Overview: Services, Mechanisms and Attacks- The OSI security model Architecture- A model for Network Security, Classical Encryption Techniques: Substitution Techniques- Transposition Techniques- Rotor Machines- Symmetric Cipher Model - block Ciphers and Data Encryption Standard: Simplified DES- Block Cipher Principles.

UNIT II NUMBER THEORY (09)

Groups, Rings and Fields- Modular Arithmetic- Euclid's Algorithm- Finite Fields of the form GF (p)- Finite Fields of the form GF (2n)- Polynomial Arithmetic- Congruence's and residue classes- Euler's Phi Functions- The theorems of Fermat and Lagrange- Computer Square roots modulo integer- Computer Square roots modulo composite- Blum Integers.

UNIT III PUBLIC KEY ENCRYPTION AND HASH FUNCTIONS (09)

Public Key Cryptography: Principles of public key cryptosystems- The RSA Algorithm- Message Authentication and Hash Functions: Authentication Requirements- Authentication Functions- Message Authentication Codes- Hash Functions- Security of Hash Functions and MAC's.

UNIT IV NETWORK SECURITY (09)

Electronic Mail Security: Pretty Good Privacy- S/MIME- IP Security: IP Security Overview- IP Security Architecture- Authentication Header- Encapsulating Security Payload- Combining Security Associations- Key management- Web Security: Web Security Considerations- Secure Socket Layer and Transport Layer Security- Secure Electronic Transaction.

UNIT V SYSTEM SECURITY (09)

Intruders: Intruders- Intruder Detection- Password Management- Malicious Software: Viruses and Related Threats- Virus Countermeasures- Firewalls: Firewall Design Principles- Trusted Systems.

LECTURE : 45 TUTORIAL : 0 TOTAL : 45

Text Book

William Stallings, "**Cryptography and Network Security, Principles and Practice**", *Fourth Edition, prentice Hall, January, 2009.*

Reference Books

1. *Wenbo Mao, "**Modern Cryptography**", Pearson Education, 2005.*

2. *BruceSchneier, "**Applied Cryptography**", Second Edition, Toha Wiley & Sons, January 2009.*

3. *Douglas R. Stinson, "**Cryptography: Theory and Practice**", CRC Press, Second Edition 2002.*

12I703 SOFTWARE ENGINEERING
[Common to CSE & IT]

L T P C
3 0 0 3

UNIT I INTRODUCTION   (09)

Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

UNIT II PROJECT MANAGEMENT   (09)

Project Management Concepts -Software Project Planning Risk analysis and management-project scheduling and tracking-software quality assurance-Software configuration management

UNIT III REQUIREMENT ANALYSIS   (09)

Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping -S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT IV DESIGN   (09)

Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles – Component level design. Real time systems - Real time software design – system design – real time executives – data acquisition system - monitoring and control system.

UNI V TESTING   (09)

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging.-Technical Metrics for Software.

LECTURE 45 TUTORIAL: 0 TOTAL : 45

Text Book

   Roger Pressman.S, *"Software Engineering : A Practitioner's Approach"*(6th Edition), McGraw Hill, 2005.

Reference Books

1. Ian Sommerville, *"Software Engineering"* , 6th Edition, Pearson Education Asia, 2003.

2. S.A. Kelkar, *"Software Engineering, A Concise Study"*, Prentice Hall of India, 2011.

3. Carlo Ghezzi, Mehdi Jazayeri and Dino Mandrioli, *"Fundamentals of Software Engineering"*, Second Edition, Prentice Hall of India, 2003.

4. Richard E. Fairley, *"Principles of Software Engineering"*, Wiley Blackwell, 2009.

5. Shari Pfleeger, Joanne Atler, *"Software Engineering: Theory and Practice"*, Fourth Edition, Pearson Education, 2009.

12I704 MOBILE COMPUTING

[Common to CSE & IT]

L T P C

3 0 0 3

UNIT I INTRODUCTION   (09)

Introduction to mobile computing. Convergence of Internet, digital communication and computer networks. Sharing of wireless channels: FDMA, TDMA, CDMA. MAC layer issues in wireless communication,Satellite systems – Overview of Wireless Sensor Networks.

UNIT II WIRELESS LAN   (09)

Wireless LAN: Infra red Vs Radio transmission, Infra structure and Adhoc Networks – IEEE 802.11,HIPERLAN – Bluetooth, ZigBee. Network layer issues ad hoc and sensor networks

UNITIII WIRELESS ATM AND ADHOC NETWORKS   (09)

Motivation for WATM - Services - Reference model - Functions - Radio access layer – Handover- Location management - Addressing - Mobile QOS - Access point control. Adhoc Networks: Routing in mobile host- Destination sequence, Distance vector, Dynamic Source routing, Hierarchical algorithms, IP mobility: Mobile IP and IDMP.

UNIT IV NETWORK ISSUES   (09)

Mobile IP – DHCP – Mobile Transport layer – Indirect TCP – Snooping TCP – Mobile TCP –Transmission / Time out freezing – Selective retransmission – Transaction oriented TCP.

UNIT V SUPPORT FOR MOBILITY   (09)

File Systems – World Wide Web – Wireless Application Protocol – Security – Analysis of existing wireless network, Analysis of algorithms and termination detection.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Books

1. *Schiller J, "**Mobile Communications**", Pearson Education Asia, Second Edition, 2007.*

2. *Feng Zhao, Leonidas Guibas, "**Wireless Sensor Networks: An Information Processing Approach**", Elseivier 2004.*

Reference Books

1. *Charles E Perkins, "**Mobile IP: Design Principles and Practices**", Pearson Education Asia,2008.*

2. *William Stallings, "**Wireless Communications & Networks**", Prentice Hall of India, Second Edition, 2005.*

3. *Reza B'Far, "**Mobile Computing Principles**", Cambridge University Press, 2006.*

4. *T. Rappaport, "**Wireless Communication: Principles and Practice**", Pearson Education.*

5. *Sipra Dasbit and Bilap K. Sikdar,"**Mobile Computing**",Latest Print 2009.*

12I707 SOFTWARE ENGINEERING LABORATORY

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LIST OF EXPERIMENTS

1. Reusable software resources

2. LOC based estimation, FP based estimation

3. COCOMO model

4. Risk Identification and Risk Projection

5. Time line charts and Tracking the schedule

6. Quality Assurance and Reliability

7. Version control and Change Control

8. Data flow diagrams

9. Jackson system development

10. Black box testing

11. White box testing

12. Mini project

TOTAL: 45

12I708 NETWORK SECURITY AND ELECTIVE LAB
[Common to CSE & IT]

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0 0 3 2

1. Substitution Techniques

a. Implementation of Vigenere Cipher

b. Implementation of Playfair Cipher

c. Implementation of Hill Cipher

2. Transposition Techniques

a. Implementation of Rail fence Technique

b. Implementation of Rotor Mechanism

3. Implementation of DES

4. Implementation of RC4 and RC5

5. Implementation of RSA algorithm

6. Implementation of Elliptic Curve Cryptography

7. Implementation of SHA

8. Implementation of MD5

9. Implementation of Steganography

10. Cryptanalysis

11. Configuring Firewall

12. Experiments Corresponding to Electives

TOTAL: 45

12I6E0 APPLIED NUMERICAL METHODS

L T P C

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UNIT I SOLUTIONS OF EQUATIONS AND EIGEN VALUE PROBLEMS (09)

Solution of equation-Iteration method , Newton – Raphson Method for single variable and for simultaneous equations with two variables – Solutions of Linear system by Gaussian elimination , Gauss – Jordan , Gauss – Seidel Methods – Eigen value of a Matrix by Power Method and by Jacobi method for symmetric matrix.

UNIT II INTERPOLATION (09)

Operators – Relation between the operators – Newton's divided difference formula – Langrange's and Interpolating with a cubic spline - Newton Forward and Backward difference formulae – Stirlings and Bessel's Central difference formulae.

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION (09)

Numerical differentiation with Interpolation Polynomials – Numerical Integration by Trapezoidal and Simpson's (Both $1/3^{rd}$ and $3/8^{th}$) rules – Two and three point Gaussian quadrature formulae – Double integrals using Trapezoidal and Simpson's Rules.

UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS (09)

Single step methods – Taylor series , Euler and Modified Euler , Runge – Kutta method of order four for first order differential equations – Multistep methods – Milne and Adam's – Bashforth predictor and Corrector methods.

UNIT V BOUNDARY VALUE PROBLEMS FOR ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (09)

Finite difference solutions for the second order ordinary differential equations – Finite difference solutions for one dimensional Heat equation (Both Implicit and Explicit) – One – dimensional Wave equation and two dimensional Laplace and Poisson equations.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

Text Book

Kandasamy. P, Thilagavathy . K , Gunavathy . K., *"Numerical methods"*, S. Chand and Co., New Delhi, 2003.

Reference Books

1. Veerarajan. T and Ramachandran. T., **"Numerical Methods with Programming in C"**, Tata Mc.Graw Hill Publishers, New Delhi, 2007.

2. Balagurusamy .E., **"Numerical Methods "**, Tata Mc.Graw Hill Publishers, New Delhi, 1999, reprint 2007.

3. Grewal. B. S., and Grewal. J.S., **"Numerical Methods in Engineering and Science"**, Khanna Publishers, New Delhi, 2004.

4. Gerald.C.F., and Wheatley. P.O., **"Applied Numerical Analysis"** , (Fifth Edition) , Addison Wesley , Singapore, 1998.

5. Sastry. S. S., **"Introductory methods of numerical Analysis"** (Third edition), Prentice Hall of India, New Delhi , 1998.

6. Sankara Rao.K, **"Numerical methods for scientists and in Engineers"** (Third edition), Third edition,Prentice Hall of India, New Delhi , 2007.

12I6E1 ENTERPRISE RESOURCE PLANNING

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UNIT I INTRODUCTION   (09)

Introduction to ERP – Basic ERP Concepts – Basic ERP Concepts - Justifying ERP Investments – Risks of ERP - Benefits of ERP.

UNIT II ERP AND TECHNOLOGY   (09)

ERP and Related Technologies – Business Intelligence – E-Commerce and E-Business – Business Process Reengineering – Data Warehousing – Data Mining – OLAP – Product life Cycle management – SCM – CRM

UNIT III ERP IMPLEMENTATION   (09)

Implementation Challenges – Strategies – Life Cycle – Pre-implementation Tasks – Requirements Definition – Methodologies – Package selection – Project Teams –Process Definitions – Vendors and Consultants – Data Migration – Project management – Post Implementation Activities.

UNIT IV ERP IN ACTION & BUSINESS MODULES   (09)

Operation and Maintenance – Performance – Maximizing the ERP System – BusinessModules – Finance – Manufacturing – Human Resources – Plant maintenance –Materials Management – Quality management – Marketing – Sales, Distribution and service.

UNIT V ERP MARKET , PRESENT AND FUTURE   (09)

Marketplace – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc – SSA Global – Lawson Software – Epicor – Intuitive. Enterprise Application Integration – ERP and E-Business – ERP II – Total quality management – Future Directions – Trends in ERP.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

 Alexis Leon, *"ERP DEMYSTIFIED",* Tata McGraw Hill, Second Edition, 2008.

Reference Books

1. Vinod Kumar Garg, N. K. Venkitakrishnan, "Enterprise Resource Planning: Concepts and Practice", PHI Learning private limited, Second edition, 2011.

2. Rahul V.Altekar, "Enterprisewide Resource Planning, Theory and practice", PHI Learning private limited, 2009

3. Mary Sumner, "Enterprise Resource Planning", Pearson Education, 2007.

4. Jim Mazzullo,"SAP R/3 for Everyone", Pearson, 2007.

12I6E2 OPEN SOURCE SYSTEMS

[Common to CSE & IT]

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UNIT I INTRODUCTION TO LINUX   (09)

Introduction to GNU/Linux and basics: Linux distributions — File System Introduction — File System Hierarchies— File system security with reference to SELinux —Types of partitions and mount options — RAID overview— Logical Volume Management

UNIT II WORKING WITH LINUX   (09)

Using GNU/Linux (Shell Commands): Overview of Shells – BASH and other important shells — Process Management — User Administration— Networking overview and commands —Introduction to IO redirection— Software Repositories

UNIT III PHP AND MYSQL   (09)

PHP: Introduction- Programming in Web Environment- Variables- Constants- Data types- Operators- Statements- Functions- Arrays- OOP- String manipulation and regular expression- MySQL: Introduction – Setting up account – Starting, terminating and writing your own SQL programs – Record selection Technology – Working with strings – Date and Time

UNIT IV PYTHON PROGRAMMING   (09)

Syntax and Style – Python Objects – Numbers – Sequences – Strings – Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output – Errors and Exceptions – Functions – Modules – Classes and OOP – Execution Environment.

UNIT V OPEN SOURCE TOOLS AND TECHNOLOGIES   (09)

Web Server: Apache Web server – Working with Web server – Configuring and using Apache Web services – Open Source Software tools and processors – Eclipse IDE platform – Compilers – Model Driven Architecture tools.

LECTURE: 45 TUTORIAL: 0 TOTAL:45

Text Books

1. *"**Introduction to Linux Installation and Programming**" N. B. Venkateshwarlu (Ed); B S Publishers; Hyderabad, 2005.(An NRCFOSS Publication)*

2. *Rasmus Lerdorf and Levin Tatroe, "**Programming PHP**", O' Reilly Publications, USA 2002.*

3. *Peter Wainwright, "**Professional Apache**", Wrox Press, USA, 2002.*

Reference Books

1. **The Linux Cookbook: Tips and Techniques for Everyday Use,** *First Edition, Michael Stutz, 2001.URL:http://dsl.org/cookbook/cookbook_toc.html*

2. *"**The Linux System Administrator's Guide**", http://tldp.org/LDP/sag/html/sag.html*

3. *"**The Software-RAID HOWTO**", Jakob Østergaard, http://www.tldp.org/HOWTO/Software-RAID-HOWTO.html*

4. *"**The Network Administrators' Guide,Olaf Kirch**", http://tldp.org/LDP/nag/nag.html*

12I6E3 BIO INFORMATICS

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UNIT I INTRODUCTORY CONCEPTS (09)

The Central Dogma – The Killer Application – Parallel Universes – Watson's Definition – Top Down Versus Bottom up – Information Flow – Convergence – Databases – Data Management – Data Life Cycle – Database Technology – Interfaces – Implementation – Networks – Geographical Scope – Communication Models – Transmissions Technology – Protocols – Bandwidth – Topology – Hardware – Contents – Security – Ownership – Implementation – Management.

UNIT II SEARCH ENGINES AND DATA VISUALIZATION (09)

The search process – Search Engine Technology – Searching and Information Theory – Computational methods – Search Engines and Knowledge Management – Data Visualization –sequence visualization – structure visualization – user Interface – Animation Versus simulation

– General Purpose Technologies.

UNIT III STATISTICS AND DATA MINING (09)

Statistical concepts – Microarrays – Imperfect Data – Randomness – Variability – Approximation– Interface Noise – Assumptions – Sampling and Distributions – Hypothesis Testing – Quantifying Randomness – Data Analysis – Tool selection statistics of Alignment – Clustering and Classification – Data Mining – Methods – Selection and Sampling – Preprocessing and Cleaning – Transformation and Reduction – Data Mining Methods – Evaluation – Visualization – Designing new queries – Pattern Recognition and Discovery – Machine Learning – Text Mining – Tools.

UNIT IV PATTERN MATCHING (09)

Pairwise sequence alignment – Local versus global alignment – Multiple sequence alignment – Computational methods – Dot Matrix analysis – Substitution matrices – Dynamic Programming– Word methods – Bayesian methods – Multiple sequence alignment – Dynamic Programming– Progressive strategies – Iterative strategies – Tools – Nucleotide Pattern Matching –Polypeptide pattern matching – Utilities – Sequence Databases.

UNIT V MODELING AND SIMULATION (09)

Drug Discovery – components – process – Perspectives – Numeric considerations – Algorithms– Hardware – Issues – Protein structure – AbInitio Methods – Heuristic methods – Systems Biology – Tools – Collaboration and Communications – standards - Issues – Security – Intellectual property.

LECTURE 45 TUTORIAL: 0 TOTAL : 45

Text Book

Bryan Bergeron, **"Bio Informatics Computing"**, *Second Edition, Pearson Education, 2003.*

Reference Book

T.K.Attwood and D.J. Perry Smith, **"Introduction to Bio Informatics,** *Longman Essen,1999.*

12I6E4 OPTIMIZATION TECHNIQUES AND APPLICATIONS

[Common to CSE & IT]

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UNIT I (09)

Introduction of operation research-LP Formulations-Graphical method for solving LP's with 2 variables- Simplex method-Duality theory in linear programming and applications-Integer linear programming- Dual simplex method.

UNIT II (09)

Transportation problem- Assignment problem.Dynamic Programming : Basic Concepts, Bellman's optimality principles-Dynamics programming approach in decision making problems- optimal subdivision problem.

Sequencing Models: Sequencing problem, Johnson's Algorithm for processing n jobs through 2 machines, Algorithm for processing n jobs through 3 or more machines, Processing 2 jobs through n machines.

UNIT III (09)

Project Management : PERT and CPM : Project management origin and use of PERT-origin and use of CPM-Applications of PERT and CPM- Project Network, Diagram representation-Critical path calculation by network analysis and critical path method (CPM)- Determination of floats- Construction of time chart and resource labelling- Project cost curve and crashing in project management-Project Evaluation and review Technique (PERT).

UNIT IV (09)

Queuing Models : Essential features of queuing systems-operating characteristics of queuing system- probability distribution in queuing systems-classification of queuing models and its solutios.

UNIT V (09)

Inventory Models : Introduction to the inventory problem-Deterministic Models-The classical EOQ (Economic Order Quantity) model- Inventory models with deterministe demands(no shortage & shortage allowed)-Inventory models with probabilistic demand-multi item determinise models.

Text Book

> Gillet B.E. : **Introduction to Operation Research, Computer Oriented Algorithmic approach** - *Tata McGraw Hill Publising Co. Ltd. New Delhi.*

Reference Books

1. *P.K. Gupta & D.S. Hira, **"Operations Research"**, S.Chand & Co.*

2. *J.K. Sharma, **"Operations Research: Theory and Applications"**, Mac Millan.*

3. *S.D. Sharma, **"Operations Research"**, Kedar Nath Ram Nath, Meerut (UP).*

4. *S.S. Rao **"Optimization Theory and Application"**, Wesley Eastern.*

5. *Tata Hamdy, A **"Operations Research - An Introduction"**, Fifth Edition, Prentice Hall of India Pvt. Ltd., New Delhi.*

12I7E0 HIGH PERFORMANCE ARCHITECTURE

[Common to CSE & IT]

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UNIT I SCALABILITY AND CLUSTERING (09)

Evolution of computer architecture " Dimensions of scalability " Parallel computer models – Basic concepts of clustering " Scalable design principles " Parallel programming overview " Processes " Tasks and threads " Parallelism issues " Interaction / Communication issues " Semantic issues in parallel programs.

UNIT II ENABLING TECHNOLOGIES (09)

System development trends " Principles of processor design " Microprocessor architecture families " Hierarchical memory technology " Cache coherence protocols " Shared memory consistency " Distributed cache memory architecture " Latency tolerance techniques " Multithreaded latency hiding.

UNIT III SYSTEM INTERCONNECTS (09)

Basics of interconnection networks " Network topologies and properties " Buses " Crossbar andmultistage switches " Software multithreading " Synchronization mechanisms.

UNIT IV PARALLEL PROGRAMMING (09)

Paradigms and programmability " Parallel programming models " Shared memory programming.

UNIT V MESSAGE PASSING PROGRAMMING (09)

Message passing paradigm " Message passing interface " Parallel virtual machine.

LECTURE 45 TUTORIAL: 0 TOTAL : 45

Text Books

1. *Kai Hwang and Zhi.Wei Xu,* **"Scalable Parallel Computing",** *Tata McGraw-Hill, 2003.*

2. *Culler, D.E. and Jaswinder Pal Singh,* **"Parallel Computing Architecture: A Hardware/ Software Approach",** *Morgan Kaufman Publishers, 1999.*

Reference Books

1. *Quinn, M. J.,* **"Parallel Programming in C with MPI and OpenMP",** *Tata McGraw-Hill, 2003.*

2. *Kai Hwang,* **"Advanced Computer Architecture",** *Tata McGraw-Hill, 2003.*

12I7E1 XML AND WEB SERVICES

[Common to CSE & IT]

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UNIT I ESSENTIALS OF XML (09)

XML in Context – Fundamentals of XML – Validating XML with DTD – Creating XML schemas – Xfiles – Defining XML using alternate schema representation.

UNIT II BUILDING XML BASED APPLICATIONS (09)

Parsing XML using DOM, SAX – Transforming XML with XSL – Integrating XML with databases – Formatting XML for the web – XML and content management.

UNIT III WEB SERVICES (09)

Architecting web services – Web services building blocks: Simple Object Access Protocol, Web Services Description language, Universal Description Discovery and Integration.

UNIT IV APPLIED XML (09)

Understanding XML standards – Implementing XML in E-Business – Delivering wireless and voice services with XML.

UNIT V SEMANTIC WEB (09)

Basics of Resource Description Framework – RDF specifications and Data Model - RDF schema – Precursor of Semantic web - Architecture of semantic web.

LECTURE 45 TUTORIAL: 0 TOTAL : 45

Text Book

*Ron Schmelzer et al. "**XML and Web Services**", Pearson Education, 2008.*

Reference Books

1. *Frank P. Coyle, "**XML, Web Services and Data revolution**", Pearson Education, 2009.*

2. *Keith Ballinger, ". **NET Web Services Architecture and Implementation**", Pearson Education, 2003.*

3. *David Chappell, "**Understanding .NET A Tutorial and Analysis**", Addison Wesley, 2002.*

4. *Kennard Scibner and Mark C.Stiver, " **Understanding SOAP**", SAMS publishing.*

5. *Alexander Nakhimovsky and Tom Myers, "**XML Programming: Web Applications and Web Services with JSP and ASP**", Apress, 2002.*

12I7E2 AI AND EXPERT SYSTEMS

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UNIT I PROBLEMS AND SEARCH (09)

Artificial Intelligence: Problems, Problem Spaces and Search: Defining the problems as a State Space Search-Production Systems-Problem characteristics-Production System characteristics - Heuristic Search Techniques: Generate and test-Hill Climbing-Best first search-Problem reduction-Constraint satisfaction-Means ends analysis-Knowledge representation issues.

UNIT II KNOWLEDGE REPRESENTATION (09)

Implementation-Using predicate logic: Representing simple facts in logic, representing instance and ISA relationships, Computable functions and predicates- Resolution-Natural deduction-Representing knowledge using rules: Procedural versus declarative knowledge, logic programming, forward versus backward reasoning, matching, control knowledge-Symbolic Reasoning under uncertainty-Introduction to Non monotonic reasoning – Logics for Non monotonic Reasoning – Implementation issues-Augmenting a problem solver-Implementation – Statistical Reasoning: Probability and Baye's theorem – certainty factors and rule based systems – Bayesian networks – Dempster- Shafer Theory - Fuzzy logic- Weak Slot and Filler structures: Semantic nets-Frames– Strong slot and Filler structures: Conceptual dependency-Scripts-CYC.

UNIT III ADVANCED AI TOPICS (09)

Game playing: the Minimax search procedure -Adding Alpha-beta cutoffs-Additional refinements- Iterative Deepening – Planning: Overview- An example domain: The blocks world-Components of a planning system-Goal stack planning-Nonlinear planning using constraint posting-Hierarchical planning-Reactive systems- Understanding-Natural language Processing – Syntactic processing – semantic analysis – Discourse and pragmatic processing – Statistical natural language processing – spell checking-Parallel and Distributed AI: Psychological Modeling-Parallelism in reasoning systems-Distributed Reasoning systems.

UNIT IV LEARNING (09)

Learning – Connectionist model: Introduction: Hopfield networks-Learning in neural networks-Applications of neural networks-Recurrent networks-Distributed representation-Connectionist AI and Symbolic AI-Common sense: Qualitative physics-Common sense ontologies - Memory Organization-Case-Based Reasoning-Prolog-The Natural Language of Artificial intelligence: Converting English to prolog facts and rules-Goals-Prolog terminology-Variables-Control structures-Arithmetic operators-Matching in prolog-Backtracking-Cuts-Recursion-Lists-Dynamic Databases- Input/output and streams.

UNIT V EXPERT SYSTEMS (09)

Introduction to expert system-Expert system tools: Knowledge representation-Nature of expert system tools-Stages in the development of expert system tools-Examples.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Books

1. *Elaine Rich, Kevin Knight, Shivashankar B Nair," **Artificial Intelligence**" Tata Mc Graw hill publications, Third edition 2009.*

2. *Donald A. Waterman," **A Guide to Expert Systems**", Pearson education, 2009*

Reference Books

1. *Dan W. Patterson, "**Introduction to Artificial Intelligence and Expert Systems**", Pearson education 1990.*

2. *Russell, S. and Norvig, P., "**Artificial Intelligence: A Modern Approach**", Pearson Education.2006.*

3. *Nilsson, N. J., "**Artificial Intelligence: A New Synthesis**", Morgan Kaufmann. 1998.*

4. *Bratko, I., "**Prolog Programming for Artificial Intelligence**", 3rd Ed., Pearson Education. 2001.*

12I7E3 DIGITAL IMAGE PROCESSING

[Common to CSE & IT]

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UNIT I FUNDAMENTALS OF DIGITAL IMAGE PROCESSING   (09)

Introduction – Fundamental Steps in image processing – Building blocks of Digital Image Processing systems – Image Acquisition, Storage, Processing, Display and Communication Interface, Digital Image Representation – Sampling and Quantization – Some Basic Relationships between pixels – Neighbors and Connectivity, Distance Measures, Image Transform – Fourier Transform – Discrete Fourier Transform – Some properties of Fourier Transform – Fast Fourier transform – FFT Algorithm, Inverse FFT, DCT – Properties, Walsh Transform, Hadamard Transform, Haar Transform, Slant Transform, Hotelling Transform.

UNIT II IMAGE ENHANCEMENT   (09)

Introduction – Spatial and frequency domain approaches – Frequency domain Techniques – Spatial domain Techniques, Spatial Filtering, Frequency domain – Gray Level to Color Transform.

UNIT III IMAGE COMPRESSION   (09)

Introduction – Coding Redundancy, Inter pixel redundancy, Psycho Visual redundancy, Image compression models, The source Encoder and Decoder, The channel Encoder and Decoder, Information Theory, Classification, Huffman coding, Lossy compression Techniques, Threshold coding, Vector quantization, Image compression standard (JPEG).

UNIT IV IMAGE SEGMENTATION   (09)

Introduction, Detection of isolated points, Line detection, Edge detection, Edge linking and Boundary detection, Region oriented segmentation, Segmentation using threshold, Accumulative difference image.

UNIT V IMAGE RESTORATION, REPRESENTATION AND DESCRIPTION   (09)

Introduction: Degradation model, Degradation model for continuous functions, Discrete Degradation Model, Estimation of Degradation function by experimentation and modeling, Inverse filtering approach, LMS filter, Interactive Restoration, Constrained Least Square Restoration, Boundary Representation using chain codes, Linear Signature, Shape number, Fourier descriptors, Moments Region representation, Regional descriptor, Texture, Relational Descriptors.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

> Annadurai. S, Shanmugalakshmi. R, *“Fundamentals of Digital Image Processing”*, *Pearson Education (Singapore) Pvt. Ltd., 2007.*

Reference Books

1. *Rafael C. Gonzalez and Richard E. Woods, “Digital Image Processing”, Third Edition, Pearson Education, 2008.*

2. *S. Sridhar, “Digital Image Processing”, OXFORD University press, 2011.*

3. *Madhuri A Joshi , “ Digital Image Processing”, PHI ,2006*

12I7E4 GRID COMPUTING
[Common to CSE & IT]

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UNIT I THE GRID PAST, PRESENT AND FUTURE (09)

Definition of Grid – Building blocks of the Grid – Grid Applications – Grids on the Horizon – Evolution of the Grid – First Generation – Second Generation – Third Generation.

UNIT II GRID ARCHITECTURE AND TECHNOLOGIES (09)

Virtual organizations and the Grid – The Nature of Grid Architecture – Grid Architecture description – Grid Architecture in practice – the need for inter grid protocols – Relationship with other technologies – Implementing Grid Architecture – other perspectives on Grids.

UNIT III OPEN GRID SERVICE ARCHITECTURE (09)

Introduction –Service oriented Grid Architecture - Significance of data for e-Science - Building on an OGSA platform – OGSA Services and Schema - Issues with OGSA – OGSA Implementation - .OGSI - Grid Service – Using OGSA Mechanism to build VO structures

UNIT IV GRID PROTOCOLS (09)

Grid Security Infrastructure – Grid Resource Allocation and Management Protocol – Grid File Transfer Protocol – Grid Information Service Protocol

UNIT V GRID COMPUTING TOOLKITS (09)

Globus Tool Kit 4 Architecture, Programming Model – Globus High Level Services – OGSI..Net – Programming Model.

LECTURE: 45 TUTORIAL: 0 TOTAL:45

Text Books

1. **"Grid Computing – Making the Global Infrastructure a Reality"**, *Fran Berman, Geoffrey Fox and Tony Hey. Wiley India, Ninth Edition, 2010*

2. **"The Grid 2 – Blue Print for a New Computing Infrastructure"**, *Ian Foster and Carl Kesselman, Elsevier, Second Edition, 2006*

Reference Books

1. **"Grid Computing"**, *Joshy Joseph and Craig Fellenstein , Pearson PHI, 2003*

2. **"Grid Computing: A Practical Guide to Technology and Applications"**, *Ahmar Abbas, Firewal Media, 2008*

12I7E5 COMPONENT BASED TECHNIQUES

(Common to CSE & IT)

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UNIT I INTRODUCTION (09)

Introduction – Standards – Terms and Concepts – Standardization and Normalization – Components and Interfaces – Callbacks – Contracts – Examples – Self interference and Object reentrance – Polymorphism – Object vs. class composition – Patterns, Frameworks and architectures.

UNIT II JAVA BASED COMPONENT TECHNOLOGIES (09)

Overview and history of java components – Java the language – Java Beans – Java Services – Applets, Servlets, Beans and Enterprise Beans – Advanced Java Services – Interfaces vs Classes in java - JXTA and Jini – Java and Web services

UNIT III CORBA (09)

Object and component "wiring" standards – CORBA – The object request broker – CORBA Services – CORBA Component Model – Portable object Adapter – CCM Components, Containers – CORBA Complaint implementations – CORBA facilities– Application objects –CORBA, UML, XML and MDA.

UNIT IV NET BASED COMPONENT TECHNOLOGIES (09)

COM - Object reuse - Interfaces and Polymorphism – COM object creation and COM Library – initializing objects, persistence, structural storage, monikers – From COM to distributed COM -Meta-information and Automation – Other COM services- OLE containers and servers - Active X controls - Contextual Composition and Services - .NET framework -.NET components -Assemblies - Common language Frameworks

UNIT V COM OVERVIEW AND COMPONENT FRAMEWORKS (09)

Component Architecture - Component Frameworks: Contribution of contextual component frameworks - Frameworks for contextual composition - Black box component framework - Black box and OLE - Portos - Component Development : Component oriented programming - Tools - Component Distribution and Acquisition - Component Assembly.

LECTURE: 45 TUTORIAL : 0 TOTAL : 45

Text Book

Clemens Szyperski, Dominik Gruntz and Stephen Murer, "**Component Software: Beyond Object-Oriented Programming**", *Pearson Education publishers, 2007.*

Reference Books

1. *Ed Roman,* "**Mastering Enterprise Java Beans**", *John Wiley & Sons Inc., 1999.*

2. *Mowbray,* "**Inside CORBA**", *Pearson Education, 2003.*

3. *Freeze,* "**Visual Basic Development Guide for COM & COM**+", *BPB Publication, 2001.*

4. *Hortsamann, Cornell,* "**CORE JAVA Vol-II**" *Sun Press, 2002.*

12I7E6 PRINCIPLES OF WIRELESS COMMUNICATION

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UNIT I INTRODUCTION (09)

Introduction – Modern Wireless Communication Systems: 2G and 3G Wireless networks, WLL and LMDS, WLAN, Bluetooth and PANs – Cellular concepts: System Design Fundamentals: Frequency reuse, Channel assignment Strategies, Interference and System capacity, Trunking and Grade of service, Improving coverage and Capacity.

UNIT II MOBILE RADIO PROPAGATION (09)

Large scale path loss – Introduction, Reflection, Ground reflection, Diffraction, Scattering, Link budget design Outdoor and Indoor propagation models, Signal penetration - small scale fading and Multipath: Impulse response model, parameters, Types of small-scale fading, Statistical models, Multipath shape factors.

UNIT III MODULATION, EQUALIZATION. DIVERSITY AND CHANNEL CODING (09)

Digital modulation, Line coding, Pulse shaping, Geometric representation, Linear modulation, Constant envelope modulation, Combined linear and Constant envelope, Spread spectrum modulation, Modulation performance, Survey of equalization, Linear and Non-Linear equalization, Adaptive equalization, Diversity, RAKE receiver, Interleaving, Channel coding, Block and convolution codes, Coding gain, Trellis and Turbo Codes.

UNIT IV SPEECH CODING AND MULTI ACCESS TECHNIQUES (09)

Characteristics, Quantization, ADPCM, Vocoders, LPC, Choosing speech codecs, GSM and USDC Codecs, Performance Evaluation, FDMA, TDMA, Spread Spectrum Multiple Access, SDMA, Packet Radio, Capacity of Cellular Systems.

UNIT V WIRELESS NETWORKING AND STANDARDS (09)

Development, Traffic routing, Data services, CCS, ISDN, SS7, PCS/PCNs, Protocols for Network access, Network Databases, UMTS – AMPS and ETACS, United states Digital cellular, GSM, CDMA, CT2, DECT, PACS, PDC, PHS, US PCS and ISM bands, US wireless cable television.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

Rappaport.T.S. "**Wireless Communication principles and Practice**", Pearson Education, 2002.

Reference Books

1. Schiller J, "**Mobile Communications**", Pearson Education Asia, Second Edition, 2007.

2. Reza B'Far, "**Mobile Computing Principles**", Cambridge University Press, 2006.

3. Charles E Perkins, "**Mobile IP: Design Principles and Practices**", Pearson Education Asia, 2008.

12I7E7 DATA WAREHOUSING AND DATA MINING

[Common to CSE & IT]

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UNIT I INTRODUCTION TO DATA WAREHOUSE (09)

Introduction- a multi dimensional data model – Data cube technology-Data warehouse architecture- Types of OLAP servers-Data warehouse implementation-Data warehousing to data mining.

UNIT II INTRODUCTION TO DATA MINING AND ASSOCIATION MINING (09)

Data mining – functionalities - Major issues - Data cleaning - Data integration and Transformation - Data reduction - Discretization and concept hierarchy generation-Efficient and scalable frequent item set mining methods-Mining various kinds of association rules-Association mining to correlation analysis-Constraint based association mining.

UNIT-III CLASSIFICATION AND PREDICTION (09)

Introduction – Issues – Classification by decision tree induction - Bayesian classification- Rule based classification-Classification by back propagation- Other classification methods- Prediction-Accuracy and error measures- Evaluating the accuracy.

UNIT IV CLUSTER ANALYSIS (09)

Cluster analysis – Types of data – 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-Data mining system products-Additional themes on data mining.

UNIT V GRAPH MINING AND MULTIMEDIA MINING (09)

Graph mining- Multirelational data mining-Multidimensional analysis and descriptive mining of complex data objects-Spatial data mining-Multimedia data mining-Text mining-Mining the world wide web-Data mining applications

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

Jiewei Han, Micheline Kamber, "**Data mining concepts and techniques**", Morgan Kaufmann Pub, 2006.

Reference Books

1. William H. Inmon, "**Building the data ware house**", Wiley Dreamtech (p) Ltd., IV Edition, 2005.

2. Ian H.Witten, Eibe Frank, "**Data Mining: Practical M/c Learning tools and techniques with Java implementation**", Third Edition, Morgan Kaufman, 2000.

3. K.P.Soman,Shyam Diwakar,V.Ajay, " **Insight into Data Mining, theory and practice**", PHI Learning private Limited, 2010.

4. Ronen Feldman, James Sangee, "**The Text Mining Handbook: Advanced Approaches in analyzing unstructured data**", Cambridge University Press, 2007.

12I7E8 HIGH PERFORMANCE NETWORKS

[Common to CSE & IT]

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UNIT I PACKET SWITCHED NETWORKS (09)

OSI and IP models, Ethernet (IEEE 802.3), Token ring (IEEE 802.5), Wireless LAN (IEEE 802.11) FDDI, DQDB, SMDS: Internetworking with SMDS

UNIT II ISDN AND BROADBAND ISDN (09)

ISDN - Overview, interfaces and functions, Layers and services - Signaling System 7 – Broadband ISDN architecture and Protocols.

UNIT III ATM AND FRAME RELAY (09)

ATM: Main features-addressing, signaling and routing, ATM header structure-adaptation layer, management and control, ATM switching and transmission. Frame Relay: Protocols and services, Congestion control, Internetworking with ATM, Internet and ATM, Frame relay via ATM.

UNIT IV ADVANCED NETWORK ARCHITECTURE (09)

IP forwarding architectures overlay model, Multi Protocol Label Switching (MPLS), integrated services in the Internet, Resource Reservation Protocol (RSVP), Differentiated services.

UNIT V OPTICAL NETWORKS AND SWITCHING (09)

Optical links- WDM systems, cross-connects, optical LAN's, optical paths and networks; TDS and SDS:modular switch designs-Packet switching, distributed, shared, input and output buffers.

LECTURE: 45 TUTORIAL: 0 TOTAL : 45

Text Books

1. *Jean Walrand and Pravin varaiya ,"**High Performance Communication networks**",2nd Edition,Harcourt and Morgan Kauffman, London,2000.*

2. *Sumit Kasera, Pankaj Sethi, "**ATM Networks** ", Tata McGraw-Hill, New Delhi, 2000.*

3. *Jennifer Bray and Charles F.Sturman,"**Blue Tooth**" 2nd edition, Pearson Education Asia 2001.*

Reference Books

1. *William Stallings,"**ISDN and Broadband ISDN with Frame Relay and ATM**", 4th Edition, Pearson   education asia, 2002.*

2. *Leon Gracia, Widjaja, "**Communication networks** ", 2nd edition ,Tata McGraw-Hill, New Delhi,2003.*

3. *Rainer Handel, Manfred N.Huber, Stefan Schroder ,"**ATM Networks**",3rd Edition, Pearson education asia,2002.*

4. *William Stallings,"High-speed Networks and Internets", 2nd Edition, Pearson education Asia,2003.*

12I7E9 WIRELESS SENSOR NETWORKS

[Common to CSE & IT]

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UNIT I OVERVIEW OF WIRELESS SENSOR NETWORKS (09)

Challenges for Wireless Sensor Networks-Characteristics requirements-required mechanisms, Difference between mobile ad-hoc and sensor networks, Applications of sensor networks- Enabling Technologies for Wireless Sensor Networks.

UNIT I ARCHITECTURES (09)

Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes , Operating Systems and Execution Environments, Network Architecture - Sensor Network Scenarios, Optimization Goals and Figures of Merit, Gateway Concepts.

UNIT III NETWORKING OF SENSORS (09)

Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor Networks, Low Duty Cycle Protocols And Wakeup Concepts - S-MAC, The Mediation Device Protocol, Wakeup Radio Concepts, Address and Name Management, Assignment of MAC Addresses, Routing Protocols- Energy-Efficient Routing, Geographic Routing.

UNIT IV INFRASTRUCTURE ESTABLISHMENT (09)

Topology Control, Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control.

UNIT V SENSOR NETWORK PLATFORMS AND TOOLS (09)

Operating Systems for Wireless Sensor Networks, Sensor Node Hardware-Berkeley Motes, Programming Challenges, Node-level software platforms, Node-level Simulators, State-centric programming.

LECTURE: 45 TUTORIAL: 0   TOTAL: 45

Text Book

   Holger Karl & Andreas Willig, " ***Protocols And Architectures for Wireless Sensor Networks*** " , *John Wiley, 2005.*

Reference Books

1. *Feng Zhao & Leonidas J. Guibas,* ***"Wireless Sensor Networks- An Information Processing Approach",*** *Elsevier, 2007.*

2. *Kazem Sohraby, Daniel ivlinoli, & Taieb Znati,* ***"Wireless Sensor Networks-Technology, Protocols, And Applications",*** *John Wiley, 2007.*

3. *Anna Hac,* ***"Wireless Sensor Network Designs",*** *John Wiley, 2003.*

4. *Bhaskar Krishnamachari,* ***"Networking Wireless Sensors",*** *Cambridge Press,2005.*

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12I8E0 SOFTWARE TESTING

[Common to CSE & IT]

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UNIT I INTRODUCTION (09)

Principles of testing – Software development life cycle models – Types of testing: Black box testing and White box testing.

UNIT II LEVELS OF TESTING (09)

Integration testing – System testing - acceptance testing - Performance testing – Internationalization testing –Adhoc testing.

UNIT III SPECIALIZED TESTING (09)

Testing of object oriented systems: Introduction, Primer on object oriented software, differences in OO testing; Usability and accessibility testing.

UNIT IV PEOPLE AND ORGANIZATIONAL ISSUES IN TESTING (09)

People and organizational issues in testing: Perceptions and misconceptions about testing, Comparison between testing and development functions, Career paths, Role of eco systems; Organization structures for testing teams: Dimensions, Single product and multi product companies, effects of globalization, testing service and success factors.

UNIT V TEST MANAGEMENT AND AUTOMATION (09)

Test Planning, management, execution and reporting – software test automation – test metrics and measurements.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

   Srinivasan Desikan and Gopalaswamy Ramesh, "**Software Testing – Principles and Practices**", *Pearson education, 2007.*

Reference Books

*1. Sandeep Desai, Abhisek Srivastava, "**Software testing: A Practical approach**", Prentice Hall of India, 2012.*

*2. Ilene Burnstein, "**Practical Software Testing**", Springer International Edition, 2003.*

*3. Ron Patton, " **Software Testing**", Second Edition, Sams Publishing, Pearson Education, 2007*

*4. Renu Rajani, Pradeep Oak, "**Software Testing – Effective Methods, Tools and Techniques**", Tata McGraw Hill, 2004.*

*5. Aditya P. Mathur, "**Foundations of Software Testing – Fundamental algorithms and techniques**", Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008*

12I8E1 FUZZY LOGIC AND NEURAL NETWORKS

[Common to CSE & IT]

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UNIT I FUZZY LOGIC (09)

Introduction-Fuzzy Sets-Fuzzy Relations-Fuzzyfication and defuzzzyfication methods.

UNIT II FUZZY ARITHMETICS (09)

Fuzzy arithmetic,Vectors,Extension principle-Fuzzy rule based system-linguistic hedges-Approximate Reasoning-Fuzzy optimization.

UNIT III INTRODUCTION TO NEURAL NETWORKS (09)

Introduction-Typical Archiecture,Common Activation function,McCulloch-pitts neuron, Simple neural nets for pattern classification, Linear Separability-Learning Rules,Back Propagation Network:Architecture,Training algorithm-Applications.

UNIT IV TYEPS OF NEURAL NETWORKS (09)

The BAM and Hopfield Memory-Simulated Annealing-The Counter propagation Network-Self Organizing Maps-Architecture,Algorithms and applications.

UNIT V APPLICATIONS OF NEURAL NETWORK AND FUZZY LOGIC (09)

Applications of Neural Networks: Pattern Recognition-Image Compression-Communication-Control systems-Application of Fuzzy Logic: Fuzzy pattern Recognition-Fuzzy Image Compression-Fuzzy Logic controllers.

LECTURE : 45 TUTORIAL : 0 TOTAL :45

Text Books

1. *Timothy J.Ross, "**Fuzzy Logic with Engineering Applications**", McGraw Hill 1997.*

2. *J.A.Freeman and B.M.Skapura, "**Neural Networks, Algorithms applications and Programming Techniques**", Pearson Wesley,1990.*

Reference Books

1. *J.Laurene Fausett,"**Fundamentals of Neural Networks**", Pearson Education India, New Delhi,2004.*

2. *Zimmermann.H.J**, "Fuzzy Set Theory and its Applications**", I Edition,Kluwer Academic Publishers,Dordrecht,Germany,1991.*

3. *James J.Buckley and Esfandiar Eslami,"**Advances in Soft Computing-An Introduction to Fuzzy Logic and Fuzzy Sets**", Springer International Edition, New Delhi,2011*

12I8E2 CLOUD COMPUTING

[Common to CSE & IT]

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UNIT I UNDERSTANDING CLOUD COMPUTING (09)

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services

UNIT II DEVELOPING CLOUD SERVICES (09)

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds

UNIT III CLOUD COMPUTING FOR EVERYONE (09)

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

UNIT IV USING CLOUD SERVICES (09)

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files

UNIT V ADVANCED WAY TO COLLABORATE ONLINE (09)

Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

> *Michael Miller, Cloud Computing:* **"Web-Based Applications That Change the Way You Work and Collaborate Online"***, Que Publishing, August 2008.*

Reference Books

> . *Haley Beard,* **"Cloud Computing Best Practices for Managing and Measuring   Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs"***, Emereo Pty Limited, July 2008.*

12I8E3 SOFTWARE PROJECT MANAGEMENT

[Common to CSE & IT]

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UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT (09)

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

UNIT II PROJECT EVALUATION (09)

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

UNIT III ACTIVITY PLANNING (09)

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 (09)

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.

UNIT V MANAGING PEOPLE AND ORGANIZING TEAMS (09)

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.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

  Bob Hughes, Mikecotterell, *"Software Project Management"*, Third Edition,Tata McGraw Hill, 2004.

Reference Books

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.

12I8E4 COMPUTER VISION

[Common to CSE & IT]

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UNIT I (09)

Image Formation and Image Model: Cameras: Pinhole Cameras-Cameras with Lenses, Human Eye, Geometric Camera Models: Elements of Analytical Euclidean Geometry-Camera Parameters and the Perspective Projection, Affine Cameras and Affine Projection Equations, Geometric Camera Calibration: Least Squares Parameter Estimation, A Linear Approach to Camera Calibration, Taking Radial Distortion into Account.

UNIT II (09)

Radiometry Measuring Light: Light in space, Light at Surfaces ,Important Special Cases, Sources, Shadows and Shading: Qualitative Radiometry Sources and their effects, Local Shading Models, Color: The Physics of Color, Human Color Perception, Representing Color, A Model For Image Color, Surface Color from Image Color.

UNIT III (09)

Linear Filters: Linear Filters and Convolution, Shift Invariant Linear System, Spatial Frequency and Fourier Transforms, Sampling and Aliasing, Filters as Templates, Technique Normalizes Co-relation and Finding Pattern, Edge Detection: Noise, Estimating Derivatives, Detecting Edges, Texture: Representing Texture, Analysis Using Oriented Pyramids, Application: Synthesizing Textures for Rendering, Shape From Texture.

UNIT IV (09)

The Geometry of Multiple Views: Two Views, Three Views, More Views, Stereopsis: Reconstruction, Human Stereopsis, Binocular Fusion, sing More Camera, Affine Structure from Motion: Elements of Affine Geometry, Affine Structure and Motion from Two Images, Affine Structure and Motion from Multiple Images, From Affine to Euclidean Images, Affine Motion Segmentation, Projective Structure from Motion: Elements of Projective Geometry, Projective Structure and Motion from Binocular Correspondences, Projective Motion Estimation from Multi-linear Constraints.

UNIT V (09)

Segmentation By Clustering: Human Vision: Grouping and Gestalt, Applications: short Boundary detection and Background subtraction, Image Segmentation by Clustering Pixels, Segmentation By Graph-Theoretic Clustering, Segmentation By Fitting a Model: The Hough Transform, Fitting Lines, fitting Curves, Segmentation and Fitting Using Probabilistic Methods: Missing Data Problems, Fitting and Segmentation, Tracking with linear dynamic models, Interference problem, kalman Filtering, Data Association, Application-Vehicle Tracking.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

  David A.Forsyth, Jean Ponce, ***"Computer Vision A Modern Approach"***, *Prentice Hall, 2003.*

Reference Books

*1. Linda G. Shapiro, George C. Stockman , **"Computer Vision"**, Published by Prentice Hall,2001.*

*2. Dana H. Ballard, Christopher M. Brown, **"Computer Vision"**, 2003. Prentice Hall*

12I8E5 SERVICE ORIENTED ARCHITECTURE

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UNIT I FUNDAMENTALS (09)

Design fundamentals – Introduction to Service Oriented Computing – Goal and benefits - Introduction to service orientation – problems solved by SO – Challenges, effects, origins and influences of SO – understanding design principles.

UNIT II SERVICE CONTRACTS, COUPLING AND ABSTRACTION (09)

Contracts: standardization, contracts and service design, risks, case study – Coupling: types, design, risks, case study – Abstraction: Types, measuring service abstraction, design, risks, case study.

UNIT III SERVICE REUSABILITY AND AUTONOMY (09)

Commercial and Agnostic design, Processing boundaries and control: Definition – Principle – measures – standards – design – risks – Case study.

UNIT IV STATELESSNESS, DISCOVERABILITY AND COMPOSABILITY (09)

State management deferral and stateless design – interoperability and communication – service composability.

UNIT V COMPARISON AND GOALS (09)

Service orientation and object orientation: A comparison of principles and concepts – supporting practices – mapping service orientation principles to strategic goals.

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Book

> *Thomas Erl, "SOA Principles of Service Design "(**The Prentice Hall Service-Oriented Computing Series from Thomas Erl)", 2005.*

Reference Books

1. *Thomas Erl**, "Service-Oriented Architecture: Concepts, Technology, and Design"**, Pearson Education, 2005.*

2. *Newcomer, Lomow, "**Understanding SOA with Web Services**", Pearson Education, 2005.*

3. *Sandeep Chatterjee, James Webber, "**Developing Enterprise Web Services, An Architect's Guide"**, Pearson Education, 2005.*

4. *Dan Woods and Thomas Mattern, "**Enterprise SOA Designing IT for Business Innovation" O'REILLY, First Edition, 2006*

12I8E6 CRYPTOGRAPHY AND CRYPTANALYSIS

[Common to CSE & IT]

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UNIT I INTRODUCTION TO CRYPTOGRAPHY (09)

Basic cryptographic Techniques: Classical encryption techniques, Stream Cipher, Block Ciphers Shannon's Theory. Modular Arithmetic - Euclidean Algorithm, Finite fields of the form GF(p) and GF(2^n), Fermat's and Euler's theorem, Chinese remainder theorem, Discrete Logarithms.

UNIT II SYMMETRIC ENCRYPTION (09)

Fiestel Structure, Data encryption standard, Strength of DES, Avalanche effect, Modes of operation, Advanced Encryption Standard, Triple DES, Confidentiality using Symmetric encryption.

UNIT III ASYMMETRIC ENCRYPTION (09)

Asymmetric techniques: Public key Cryptosystem based on the Discrete Logarithm Problem, Algorithms for the Discrete Logarithm Problem, Public key cryptography- RSA, ECC.

UNIT IV CRYPTANALYSIS TECHNIQUES (09)

Introduction to zero knowledge protocols, Brute Force Attack, Cryptanalysis of Monoalphabetic and Polyalphabetic substitution ciphers – Linear and Differential cryptanalysis of DES, Attack on RSA, Birthday attacks.

UNIT V COMPLEXITY ANALYSIS (09)

Complexity analysis of Brute force and other cryptanalysis techniques. Reducing search space and complexity of cryptanalysis using Genetic algorithms

LECTURE: 45 TUTORIAL: 0 TOTAL: 45

Text Books

1. *Douglas R. Stinson, Chapman & Hall, "**Cryptography Theory and Practice**", CRC Press, 2002*

2. *William Stallings,"**Cryptography and Network Security Principles and Practices** ", IV Edition, Prentice Hall of India, 2006.*

Reference Books

1. *Wenbo Mao, "**Modern Cryptography Theory and practice**, " Pearson Education, 2004.*

2. *Bruce Schneir, "**Applied Cryptography**" ,John Wiley & sons, Second Edition, 1996.*

12I8E7 SEMANTIC WEB

[Common to CSE & IT]

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UNIT I INTRODUCTION   (09)

Components – Types – Ontological Commitments – Ontological Categories –Philosophical Background - Knowledge Representation Ontologies – Top Level Ontologies – Linguistic Ontologies – Domain Ontologies – Semantic Web – Need – Foundation – Layers – Architecture.

UNIT II LANGUAGES FOR SEMANTIC WEB AND ONTOLOGIES   (09)

Web Documents in XML – RDF - Schema – Web Resource Description using RDF- RDF Properties – Topic Maps and RDF – Overview – Syntax Structure – Semantics – Pragmatics - Traditional Ontology Languages – LOOM- OKBC – OCML – Flogic Ontology Markup Languages – SHOE – OIL - DAML + OIL- OWL

UNIT III ONTOLOGY LEARNING FOR SEMANTIC WEB   (09)

Taxonomy for Ontology Learning – Layered Approach – Phases of Ontology Learning – Importing and Processing Ontologies and Documents – Ontology Learning Algorithms - Evaluation

UNIT IV ONTOLOGY MANAGEMENT AND TOOLS   (09)

Overview – need for management – development process – target ontology – ontology mapping – skills management system – ontological class – constraints – issues. Evolution – Development of Tools and Tool Suites – Ontology Merge Tools – Ontology based Annotation Tools.

UNIT V APPLICATIONS   (09)

Web Services – Semantic Web Services - Case Study for specific domain – Security issues – current trends.

LECTURE: 45 TUTORIAL: 0 TOTAL:45

Text Books

1. *Asuncion Gomez-Perez, Oscar Corcho, Mariano Fernandez-Lopez, "**Ontological Engineering: with examples from the areas of Knowledge Management, e-Commerce and the Semantic Web**" Springer, 2004*

2. *Grigoris Antoniou, Frank van Harmelen, "**A Semantic Web Primer (Cooperative Information Systems)**", The MIT Press, 2004*

Reference Books

1. *James Hendler, Henry Lieberman and Wolfgang Wahlster, **Spinning the Semantic Web: Bringing the world wide web to its full potential**. New Delhi: The MIT Press, 2004.*

2. *Shelley Powers, Practical RDF. Mumbai: O'reilly publishers, 2003.*

12I8E8 VIRTUALIZATION TECHNIQUES

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UNIT- I INTRODUCTION TO VIRTUALIZATION (09)

Basics of Virtualization – Virtualization Types – Model of Virtualization – Layers of Virtualization – Server Machine Virtualization - Application Virtualization – Goals of Virtualization – Taxonomy of Virtual Machines.

UNIT - II VIRTUALIZATION INFRASTRUCTURE (09)

Hardware Virtualization- Virtual Hardware Overview – Virtual Machine Products - Sever Consolidation – Server Pooling - Types of Server Virtualization – Business cases for Sever-Virtualization –Selecting server Virtualization Platform

UNIT - III NETWORK VIRTUALIZATION (09)

Virtual File Systems – Process Virtualization – Layers in Virtualization – Players in Virtualization - Virtualizing the Campus WAN Design – - Routing Protocols- Virtualization Aware Routing - Multi-Topology Routing – Case Studies of Network Virtualization.

UNIT - IV DESKTOP VIRTUALIZATION AND STORAGE VIRTUALIZATION (09)

Desktop Virtualization- Preparing a Virtualization Machine Host- Storage Virtualization - iSCSI Architecture – Securing iSCSI – SAN backup and recovery techniques – RAID – SNIA Shared Storage Model – Classical Storage Model – Virtual Information Systems.

UNIT – V SECURITY (09)

Secure Virtual Infrastructure- Protect Virtual Infrastructure-Prepare Business Continuity -Update Management Structure

LECTURE: 45 TUTORIAL: 0 TOTAL:45

Reference Books

*1. Dan Kusnetzky ,"**Virtualization: A Manager's Guide**", O'Reily,2011*

*2. Danielle Ruest, Nelson Ruest," **Virtualization: A Beginner's Guide**",McGraw Hill, 2009*

3. Chris Wolf, Erick M. Halter ,"Virtualization: From Desktop to the Enterprise", A Press, 2006

12S8E9 SOFTWARE QUALITY ASSURANCE

[Common to CSE & IT]

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UNIT I INTRODUCTION (09)

Overview – Software Quality – Quality Assurance – Quality assurance in Context – Quality Engineering.

UNIT II SOFTWARE TESTING (09)

Testing: Concepts, Issues and Techniques – Test activities, management and automation – Testing techniques: Adaptation, Specialization and Integration.

UNIT III SOFTWARE QUALITY ASSURANCE (09)

Defect prevention and process improvement – Software Inspection – Formal verification – Fault tolerance and failure containment – Comparing QA techniques and Activities.

UNIT IV QUALITY IMPROVEMENT AND MODELS (09)

Feedback loop and activities for quantifiable quality improvement, Quality models and measurements – Defect classification and analysis.

UNIT V RISK IDENTIFICATION AND RELIABILITY ENGINEERING (09)

Basic ideas, Traditional statistical analysis techniques, New techniques for risk identification – Software reliability engineering.

LECTURE : 45 TUTORIAL : 0 TOTAL : 45

Text Book

   Jeff Tian, "**Software Quality Engineering**", A John Wiley & Sons, Publications, 2006.

Reference Books

1. *Watts S Humphrey, "* **Managing the Software Process**", *Pearson Education Inc., 2008.*

2. *Gordon G Schulmeyer, "***Handbook of Software Quality Assurance**", *Third Edition, Artech House Publishers 2007*

3. *Nina S Godbole, "***Software Quality Assurance: Principles and Practice**", *Alpha Science International, Ltd, 2004*