

IT
152

Lalit Narayan Mithila University



Complete Syllabus

Of

B. Tech.

Information Technology



Women's Institute of Technology

Kameshwaranagar, Darbhanga - 846004

COURSE STRUCTURE

**WOMEN'S INSTITUTE OF TECHNOLOGY
L. N. MITHLA UNIVERSITY DARBHANGA**

COURSE STRUCTURE FOR BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY

Dept.	Semester	Course code	Course Title	L			P			Credits			Total Credit Sem
				T	T	P	T	P	Credits				
B. Tech (IT) SEMESTER-1													
IT	1	HS-1102	Organizational Behaviour and Industrial Psychology		3	0	0	0	3				
IT	1	MA-1101	Mathematics-I		3	1	0	0	4				
IT	1	CH-1101	Engineering chemistry		3	0	3	0	5				
IT	1	CE-1101	Engineering Mechanics		3	0	3	0	5				
IT	1	ME-1101	Elements of Mechanical Engineering		3	0	3	0	5				
IT	1	ME-1103	Work shop		2	0	3	4					
IT	1	GE-1101	FAAI-NSS										26,0

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B. Tech (IT) SEMESTER-II

IT	2	HS-1201	Communicative English	3	0	0	3
IT	2	MA-1202	Mathematics-II	3	1	0	4
IT	2	PH-1201	Physics	3	0	3	5
IT	2	EE-1201	Basic Electrical Engineering	3	0	3	5
IT	2	IT-1201	Fundamental of Information Technology	3	0	3	5
IT	2	ME-1202	Engineering Graphics	2	0	3	4
IT	2	GE-1202	EAA II-NSS				26.0

B. Tech (IT) SEMESTER-III

IT	3	CS-1301	Object Oriented Programming	3	0	3	5
IT	3	EC-1304	Introduction to Communication system	3	0	3	5

IT	3	EC-1303	Digital Electronic
IT	3	MA-1303	Mathematics-III
IT	3	HS-1303	Industrial Economics and Accounting
IT	3	EC-1302	Basic Electronics
IT	3	GE-1303	EAA III NSS
			27.0

B. Tech (IT) SEMESTER-IV

IT	4	MA-1405	Discrete Mathematical Structure and Graph Theory
IT	4	CE-1402	Environmental Science
IT	4	EE-1412	Microprocessor and it's Application
IT	4	CS-1409	Data Base System
IT	4	CS-1403	Data Structure
IT	4	GE-1404	EAA IV- NSS
IT	4	CS-1402	Computer Architecture
			27.0

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B. Tech (IT) SEMESTER-V

IT	5	CS-1512	Formal Languages & Automata Theory	3 0 0 0 3
IT	5	EC-1505	Analog Electronics	3 0 3 5 5
IT	5	SC-1517	Compiler Design	3 0 3 5 5
IT	5	IT-1505	Web Technology	3 0 3 5 5
IT	5	CS-1514	Computer Networks	3 0 0 3 3
IT	5	CS-1505	Systems Programming	3 0 3 5 5
				26.0

B. Tech (IT) SEMESTER-VI

IT	6	CS-1618	Artificial Intelligence	3 0 3 5 5
IT	6	IT-1608	Visual Programming	3 0 3 5 5
IT	6	IT-1614	Software Engineering	3 0 0 3 3
IT	6	IT-1610	Data Mining & Warehousing	3 0 0 3 3
IT	6	IT-1606	Operating Systems	3 0 3 5 5
IT	6	CS-1606	Design & Analysis of Algorithms	3 0 0 3 3
IT	6	IT-1681	Minor Project	0 0 3 2 2
				26.0

B. Tech (IT) SEMESTER-VII

IT	7	HS-1704	Personnel Management & Industrial Relation	3	0	0	3		
IT	7	IT-1713	Distributed Computing & its Applications	3	0	3	5		
IT	7	IT-1725	Wireless & Mobile Communication	3	0	0	3		
IT	7	IT-1709	Information Security	3	0	0	3		
IT	7	IT-17xx	Elective -I	3	0	0	3		
IT	7	IT-17xx	Elective -II	3	0	0	3		
IT	7	IT-1782	Project - I	0	0	6	4		
IT	7	IT-1784	Industrial Training				2	26.0	

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B. Tech (IT) SEMESTER-VIII

B. Tech (IT) SEMESTER-VIII						
			IT-1823	XML Web Services	3	0
IT	8	IT-1824	Multimedia Technology & Application	3	0	3
IT	8	IT-1815	Intrusion Detection	3	0	3
IT	8	IT-18xx	Elective -III	3	0	3
IT	8	IT-18xx	Elective -IV	3	0	3
IT	8	IT-1883	Project - II	0	0	6
						21.0

Dept.	Electives	Course code	Course Title	L	T	P	Credits	Total credit/Sem
B.Tech.(IT) Elective Subjects:								
IT	EL	IT1X63	BIO-INFORMATICS	3	0	0	3	
IT	EL	EC1X13	DIGITAL SIGNAL PROCESSING	3	0	3	5	
IT	EL	IT1X62	INTERACTIVE COMPUTER GRAPHICS	3	0	0	3	
IT	EL	IT1X61	NETWORK SECURITY	3	0	0	3	
IT	EL	CS1X04	OBJECT ORIENTED ANALYSIS & DESIGN	3	0	0	3	
IT	EL	CS1X20	CRYPTOGRAPHY	3	0	0	3	
IT	EL	IT1X07	E-COMMERCE & ERP	3	0	0	3	
IT	EL	CS1X33	GENETIC ALGORITHMS	3	0	0	3	
IT	EL	IT1X66	INTERNET & INTRANET ENGG.	3	0	0	3	
IT	EL	CS1X11	PRINCIPLES OF PROGRAMMING LANGUAGES	3	0	0	3	
IT	EL	IT1X71	E-CUSTOMER RELATIONSHIP MANAGEMENT	3	0	0	3	
IT	EL	EC1X70	EMBEDDED SYSTEMS DESIGN	3	1	0	4	

IT	EL	IT1X70	IMAGE PROCESSING & GIS	3	0	0	3
IT	EL	CS1X26	PARALLEL COMPUTING	3	0	0	3
IT	EL	IT1X72	WEB PROGRAMMING	3	0	3	5
IT	EL	CS1X22	DISTRIBUTED DATABASE	3	0	0	3
IT	EL	IT1X74	MANAGEMENT INFORMATION SYSTEM	3	0	0	3
IT	EL	CS1X31	PATTERN RECOGNITION	3	0	0	3
IT	EL	CS1X13	REAL TIME SYSTEM	3	0	0	3
IT	EL	CS1X41	NEURAL NETWORKS & APPLICATIONS	3	0	0	3

Note: Total credit in some of the semesters may vary due to elective subjects having varied combination of L-T-P.

HS-1102 *Organizational Behaviour and Industrial Psychology*

L-T-P: 3-0-0

Credits:- 3

Concept of Organization and Organizational Behaviour key elements of OB, Problematic issue of Organisation Behaviour and their remedies

(3 Lectures)

.Personality & Emotion, Concept of Perception, Learning, Determinants of personality , Type of personality,

(14 Lectures)

Perception concept of Perception, Factors affecting perception, Perception and its application in OB .-Learning .-Concept, Importance, Determinant of learning, Learning & Behaviour. Attitude:- Work related attitude, job Satisfaction, job involvement& job commitment. Value:- concept and Meaning.

Motivation :- Concept, Need for motivation ,Motivational theories:- Maslaw's need hierarchy theory and herzberg hygiene theory of Motivation.

(10 Lectures)

Group of Group and Group Dynamics.Type of Group, understanding work team. Stages of Group development, Reasons for forming and Joining group;

(8 Lectures)

. Communication:- concept of Organizational Communication , Organization conflict, Reasons ,Reasons for conflict in Organization, Power and Politics.

Leadership:- What is Leadership, Function of Leadership and Theories like Trait theory of Leadership and Managerial grid theories.

(8 Lectures)

. Concept of Organization Theory, Concept of organization Structure. Form of organizational Structure, Organizational Culture.

(7 Lectures)

Concept of Organizational Effectiveness, What is Organizational Change and why it is required , Organizational Development, Managing Global & workforce diversity.

(7Lectures)

Text Books:

1. Organizational behaviour-Stephen P. Robbin& Seema Sanghi-Pearson.
2. Organizational Behavior- Managing People and Organization Gregor Moorhead Biztantra. .

Reference Books:

1. Organisation Behavior: Managing People and Organisation- Gregor Moorhead Biztantra.

Algebra of matrices:

Elementary transformation, inverse by row transformation, canonical reduction, rank, solution of simultaneous equations, characteristic equation, eigen values – & eigen vectors. Caley-Hamilton theorem, similarity transformation, reduction to diagonal matrices.

(8 Lectures)

Differential Calculus:

Higher order derivatives (successive differentiation) and Leibnitz theorem, indeterminate form, tangent and normal, review of maxima and minima, concavity and convexity of a curve, point of inflexion, curvature and radius of curvature, pedal equation, asymptotes (for Cartesian curve only), Taylor's and Maclaurin's series, partial derivatives, Euler's theorem on homogeneous functions, harmonic function, Taylor's expansion of several variables, maxima & minima of several variables-Lagrange's method for undetermined multipliers.

(20 Lectures)

Differential equation:

First order equation, separable, homogeneous, exact, linear and Bernoulli's form, Second and Higher order equation with constant coefficients, Euler's equation: Methods of their solution, dependent and independent of solution- Wronskian's system of first order equation.

(8 Lectures)

Integral calculus I:

Definite integrals, Beta & Gamma functions (definition & related problems), error function, differentiation under integral sign-Leibnitz rule.

(8 Lectures)

Text Books:

1. Advance Engineering Mathematics- R. K. Jain & S. R. K. Iyenger, Narosa Publishing House.
2. Higher Engineering Mathematics – B. S. Grewal, Dhanna Publishers.

3. Differential calculus – Das & Mukherjee – U.N. Dhar & Sons.
4. Integral calculus – Das & Mukherjee – U.N. Dhar & Sons.

Reference Books:

1. Advance Engineering Mathematics- E. Kreyszig, 8th Edition John Wiley & Sons. New York.
2. Advance Engineering Mathematics- Wylie & Barrett- Tata McCraw Hill.
3. Linear Algebra – K. Hoffmann and R. Kunze – Prentice Hall.
4. Differential calculus – Laljee Prasad.
5. Integral calculus – S.N. Thakur and S.B. Prasad
6. Differential Equations - Laljee Prasad

L-T-P: 3-0-3**Credits:- 5**

Unit-1: Water Treatment: Introduction, Characteristics imparted by impurities in water. Hardness of water. Unit of hardness. Estimation of hardness of water. Disadvantage of hard water. Scale and Sludge formation in boilers, Caustic embitterment, Boiler corrosion, Priming and Foaming. Softening methods. Desalination of Brackish water.

(7 Lectures)

Unit- 2: Electrochemistry & Corrosion of metals and its prevention: Galvanic cell, Electrode Potential, Nernst equation, Galvanic Series, law of dry Corrosion (Parabolic, Linear, and Logarithmic law). Wet Corrosion, Type of Corrosion (Pitting, Intergranular, Crevice Corrosion, Waterline Corrosion, Stress Corrosion). Protective measures against corrosion by (i) modification of environment, (ii) modification of metals (iii) Use of protective Coatings (vi) Cathodic protection.

(7 Lectures)

Unit- 3: Chemical Thermodynamics: **First Law :** Statement, work done in isothermal, adiabatic conditions, work and heat path dependent function, heat changes, isochoric and isobaric conditions, heat capacity, C_p & C_v relations, Kirchoff's relation. **Second Law:** Need of 2nd law, Spontaneous process, Reversible process, carnot cycle, concept of entropy, Entropy changes as function of temperature, entropy change during the phase transformation, Gibb's free energy, Free energy change under various conditions. Free energy changes as criteria of reversible and irreversible process. Gibb's helmohltz's equation.

(7 Lectures)

Unit - 4: Organic reaction mechanism:- Inductive effect, hyperconjugation and Resonance Their importance in Organic chemistry. A brief discussion of reactive intermediates – Carbonium ion, Carbanion, Carbene & free radical. Types of organic reaction: Substitution, addition and elimination reactions, mechanism of polymerization. Thermosetting & Thermoplastic

resins, Engineering use of Polymeric materials. Organic insulation
and dielectric materials biopolymers.

Unit - 5: Fuels:- Classification of fuels, primary and secondary
fuels, Calorific value of fuels, Proximate and Ultimate analysis
of coal. Significance of the constituents. Determination of Calorific
value by bomb calorimeter, Petroleum refining. Knocking and
prevention. Analysis of flue gas by orsat's apparatus, combustion
calculation, Nuclear fuel, solar power, rocket fuel and hydrogen
as alternative fuel.

(8 Lectures)

Unit - 6: Fundamentals of Microwave: - IR and UV-VISIBILITY
Spectroscopy. Basic concepts of spectroscopy. Selection rule
Determination of molecular structure.

(7 Lectures)

Text Book:

1. Chemistry in engineering & Technology; Vol.-I and II.
J.C.Kuriacose & J.Rajraman Pub:TMH
2. Engineering Chemistry by Jain & Jain; Pub: Dhanpat Rai
Publication
3. Engineering Chemistry by B.K.Sharma; Pub: Kirti
Prakashan Media pvt. Ltd.
4. Essential of Experimental Engineering Chemistry by Shashi
Chawla; pub: Dhanpat Rai Publication

CE-1101 Engineering Mechanics**L-T-P: 3-0-3****Credits:- 5**

Basic Concepts of Particle, Rigid body and Law of Mechanics, Force systems: Composition & Resolution of Forces, Moments of a force about a point and about an axis; Law of moments, Equivalent forces and moment, Wrench.

(7 Lectures)

Equilibrium: Conditions of Equilibrium, Free body diagram; Types of supports and corresponding reactions, Equilibrium under different forces, Problems in equilibrium of Bars, Circular Bodies, Beams, Frames and Trusses.

(8 Lectures)

Friction: Classification, Laws of Coulomb friction, Angle of friction, Angle of repose, Cone of friction, Wedge and Block friction, Belt friction, Impending motion, Problems involving large and small contact surfaces; screw jack, Principle of virtual work and stability.

(6 Lectures)

Kinematics and Kinetics of particles : Particle dynamics in rectangular coordinates, Cylindrical coordinates and in terms of path variables, Problems based of rectilinear motion and projectile motion.

(6 Lectures)

Properties of areas : Center of Mass; Moment of inertia; Kinematics and Kinetics of rigid bodies: Circular motion of rigid bodies and General plane motion, Charle's theorem, Euler's equation of motion, D'A lembert's principle. **(8 Lectures)**

Work and Energy & Impulse and Momentum methods for particles and rigid bodies: Conservation of energy; Energy and work equations in translation & rotational motion; Impulse force and momentum, coefficient of restitution and moment of momentum equation. (Vector approach to mechanics will be followed for all the topics).

(6 Lectures)

Text Books:

1. Engineering Mechanics by Shames, Pearson's Education.
2. Mechanics for Engineers Beer, F.P. and Johnston, Tata McGraw Hill, New Delhi.

Practical:

1. Determination of reactions of beams for simply supported beams;
2. Determination of coefficient of friction by Belt friction;
3. Determination of g by Compound bar pendulum;
4. Practical based on mechanical advantage of different machines;
5. Verification of polygon law of forces by Universal force table;
6. Moment of Inertia of a flywheel;
7. Determination of coefficient of restitution for Direct central impact;
8. Problem solving based on theory classes.

Energy Resources: Renewable or non-conventional sources of energy, their origin, forms-solar, wind, biogas and biomass energy, their merits & demerits, major applications and Brief description.

(4 Lecture)

Non renewable or conventional sources of energy, the fossil fuel, coal, petroleum and natural gas.

(2 Lecture)

Review of basic concepts of Thermodynamics:

Thermodynamics system properties state processes and cycles. Heat, work, and Internal energy.

(4 Lecture)

Steam Generators: Types of boilers, water tube and fire tube boilers- their merits and demerits, boiler mountings and accessories- simple description.

(6 Lecture)

Prime Movers: simple steam turbine Gas turbine, IC engines (SI and CI) their brief description and Principles of working.

(8 Lecture)

Power Plant: Principles of working of thermal hydal and nuclear power plants work output and efficiency.

(6 Lecture)

Basic concept of Refrigeration and Air Conditioning : Principles of working of vapour compression vapour absorption and air refrigeration, principles of air conditioning systems.“

(6 Lecture)

Engineering Materials and Their Properties: Ferrous and non-ferrous metals, mechanical properties e.g. strength, hardness, resilience etc.

(4 Lecture)

Heat Treatment of Steel: Annealing, tempering quenching,
case-hardening etc.

(2 Lecture)

Text Book:

- (1) Basic Mechanical Engineering by TJ Prabhu, V.
Jaiganesh by Scitech.

Practical: Study of

1. Model of I.C.Engine- sectional view;
2. Model of Boiledrs-sectional view;
3. Model of Turbines- sectional view;
4. Model of Thermal/Hydel/Nuclear Powe plant;

L-T-P: 2-0-3

Credits:-4

(A) Black smithy shop: Introduction, study & use of black smith forging tools, anvil, swage block chisels, punches, hammers, sledge hammer, study of air blower M/c & sheering M/c

Job making - (i) Eye nail & Ring. (Lecture:7)

(B) Carpentry shop: Introduction, Study & use of various tools, marking tools, measuring tools, striking tools, drilling and boring tools, holding tools etc. Study of wood turning lather machine.

Job madding - (i) Half lap joint (ii) dovetail joint
(iii) file Handel.

(Lecture:7)

(C) Fitting shop: Introduction, study & use of different tools, cutting tools, marking tools, drill bit, die & tap , type of files, measuring tools, holding tools.

Job madding - (i) Matching gauge (ii) Chipping & filing.
(Lecture:7)

(D) Foundry shop: Introduction, study & use of cupola furnace, various tools, pattern making moulding boxes.

Job making- (i) Stuffing gland box (ii) Vee block.

(Lecture:7)

Text Book:

1. Workshop practice by Hazara Choudhary.
2. Work shop technology by S.K.Garg, University Science Press, Delhi

HS- 1201 Communicative English**L-T-P: 3-0-0****Credits: 3**

1. Basic Grammar : Structural pattern; single word substitution; Editing **(6 Lectures)**
2. Common errors, Comparison **(3 Lectures)**
3. Antonyms; Homonyms; Sentence building (Vocabulary) **(5 Lectures)**
4. Reading and writing (Comprehension) **(3 Lectures)**
5. Precis, Essay & Paragraph writing. **(4 Lectures)**
6. Expansion (word & phrase) **(3 Lectures)**
7. Official Correspondence, Memorandum; Circular letter **(4 Lectures)**
8. Applying for a job ; Resume **(3 Lectures)**
9. Business Correspondence; Report writing. **(3 Lectures)**
10. Phonetics(Symbol and Transcription); pronunciation, Reading-developing reading skill. **(8 Lectures)**

Text book:

1. English Grammar- Wren & martin
2. English Grammar- Dr. D.Thakur
3. English Grammar- J. Nesfield
4. Technical English - Sharon j Gerson and Steven M Gerson
5. Business Communication – P.D. Chaturvedi & M. Chaturvedi- Pearson Pub.

Reference books:

1. Communication in English for Technical Student-Orient Longman
2. Business Correspondence & Report writing -R.C. Sharma & Krishna Mohan – Tata Magraw Hill:

Infinite series:

Notion of convergence and divergence of infinite series- D' Alembert's Ratio test, comparison test, Rabe's Test, Cauchy's Root test, alternating series- Leibniz test absolute and conditional convergence. Uniform Convergence.

(6 Lectures)**Fourier Analysis:**

Periodic function; Fourier series-Functions of arbitrary period-Even & Odd functions-Half Range Expansions-Harmonic analysis- Complex Fourier series.

Laplace Transform: Definition and properties of Laplace Transform, Shifting Theorem, Transforms of derivatives and integrals, Multiplication by t^n , Division by t , Evaluation of integrals by L.T., Inverse Transforms. **(14 Lectures)**

Integral calculus II:

Double & Triple integrals, Rectification, Computation of surfaces & volumes, Change of variables in double integrals, Jacobians of transformations, Integrals dependent on parameters-applications. **(12 Lectures)**

Vector calculus:-

Scalar & vector point functions, differentiation of vector, velocity and acceleration, direct derivatives, concept of gradient, divergence curl, line integral, greens theorem in plane, Gauss & Stocke's theorem and simple applications.

(12 Lectures)

Text Books:

1. Advance Engineering Mathematics - R.K. Jain & S.R.K. Iyenger, Narosa Publishing House.
2. Higher Engineering Mathematics – B. S. Grewal, Khanna Publishers.
3. Engineering Mathematics – N.P. Bali

Reference Books:

- 1 Advance Engineering Mathematics- E. Kreyszig, 8th edition, John Wiley & Sons. New York.
- 2 Advance Engineering Mathematics- Wylie & Barrett- Tata McGraw Hill.
- 3 Vector Analysis 2nd edition – Chatterjee, Prentice Hall of India.
- 4 Vector Analysis – K.K. Jha
- 5 Real Analysis – N.P. Ball

Electrostatics and Electromagnetic theory: The three electric vectors, to show that normal component of D and tangential component of E are continuous across the boundary between two dielectrics, Continuity equation for charge, displacement current, Maxwell's Equation in free space, speed of plane electromagnetic waves traveling in vacuum, pointing vector, electromagnetic waves propagation in dielectrics in dielectrics and conductors.

(Lecture10)

Optics and Lasers: Temporal coherence, Michelson's interferometer for measurement of coherence length of a source, line width spatial coherence, measurement of spatial coherence using Young's interferometer, Fraunhofer diffraction by single slit, double slit and grating.

(Lectures:6)

Lasers and Laser Lights, Einstein's A and B coefficients and laser, population-inversion. Light amplification, optical resonators, resonators, Characteristics of lasers, Ruby Laser, How He-Ne laser works. (Lecture:-5)

Polarization: Unpolarized light, production of plane polarized light by Polaroid technique (principle of action to be emphasized) Brewster's law, Malus law. Double refraction, production of circular and elliptical lights, analysis of unpolarized and polarized lights, Magneto-optics effect, photo-elastic effect, electro-optic effect. (Lecture:-8)

Special theory of Relativity: Michelson – Morleys Expt., Postulates of special theory of relativity, consequences of special theory of relativity, Galilean transformation, Lorenz transformation. (Lecture:-6)

Quantum Physics: Planck's theory of black body radiation, Compton effect wave particle duality, deBroglie waves, deBroglie wave velocity, wave and group velocity, Davission and German experiment Heisenberg uncertainty principle, application of the uncertainty principle, wave functions and wave equations, Physical interpretation of wave function and their normalization, Expectation values, Schrödinger's equation time dependent form and steady state form in one dimension (Quantum mechanical operators) particle in a box, potential barrier and tunneling.

(Lecture:-12)

Text Books:

1. Concept of Modern physics; by Arthur Beiser;
Publication: TMH
2. Elements of Electromagnetic; by Mathew N. O. Sadiku Pub: Oxford University Press
3. Introduction to Electrodynamics: by David J Griffiths; Pub: Pearson Education.
4. Optics; by Ajoy Ghatak; Pub: TMH
5. Fundamentals of Physics Extended Volume; by Resnick Halliday and Walker; Pub: John Wiley & Sons, Inc. Asian Edition.

Reference Books:

- 1 Modern Physics; by G. Aruldas & P Rajagopal;
Pub: Prentice Hall of India.
- 2 Quantum Physics; by H. C. Verma Pub: Surya Publications
- 3 Lasers and Non-Linear Optics; by B. B. Laud;
Pub. New Age International (P) Ltd.
- 4 Principle of Electricity; by Leigh Page and Norman Hsley Adams; Pub: Eurasia Publishing House, New Delhi.

1. Introduction: Electrical Elements and their classification, KCL, KVL equation and node voltage method, D.C. circuits steady state analysis with independent and dependent sources, Series and parallel circuits, star delta conversion, Superposition theorem, Thevenin's theorem, Norton's theorem. Maximum Power Transfer Theorem.

(12 Lectures)

2. A. C. circuits: Common signals and there waveform, RMS and Average value, form factor and peak factor of sinusoidal wave, impedance of series and parallel circuits, Phasor diagram, Power, Power factor, Power Triangle, coupled circuits, Resonance and Q-factor, Superposition, Thevenin's and Norton's Maximum Power transfer theorem for A.C. circuits.

(12 Lectures)

3. A. C. circuits: 3- phase: Star delta, line and phase relation, Power relations, Analysis of balanced and unbalanced 3-phase circuits. (8 Lectures)

4. Magnetic circuits : Introduction, Series & Parallel magnetic circuits, Analysis of Linear and non-linear magnetic circuits, Energy storage, A. C. excitation, Eddy current and hysteresis losses.

(5 Lectures)

5. Basic indicating instruments for measurement: Current voltage, Power, Energy Insulation resistance. (5 Lectures)

Text Book:

1. Basic Electrical Engineering by Fitzgerald, et al, Tata McGraw Hill

Reference Books:

1. Fundamentals of Electrical Engineering by Leonard S. Bobrow, Oxford.
2. Fundamentals of Electrical Engineering by R. Prasad, PHI Publication

Basic Electrical Engg. Lab

Experiments concerning verification and application of the concepts defined in Syllabus. Like

1. Kirchoff's Current Law,
2. Kirchhoff's Voltage Law
3. Thevenin's Theorem
4. Norton's Theorem
5. Maximum Power Transfer Theorem (D.C)
6. 1 Phase and 3 Phase A.C. voltage, current and Power measurements
7. 3 Phase A.C. Power measurement by 2 wattmeter method
8. Magnetisation characteristics
9. Resonance in series and parallel circuit.
10. High Resistance measurement using Megger

L-T-P: 3-0-3

Credits: 5

Computer Basics: Evolution of Computers, Generation and Classification of Computers, Application of Computers, and etc **(2 Lectures)**

Computer Memory and Storage: Memory Hierarchy, RAM, ROM, Types of Secondary Storage Devices, and etc. **(2 Lectures)**

Information Technology Basics: Information, Technology, Role of Information Technology, Information Technology and Internet. and etc. **(2 Lectures)**

The Internet and its Tools: Introduction, Evolution of Internet, Basic Internet Terms Getting Connected to Internet, Internet Applications, data over Internet, Web Browser Browsing Internet Using Internet Explorer, E-mail, Search Engines, Instant Messaging **(3 Lectures)**

Emerging Trends in IT: E-Commerce, Electronic Data Interchange, Smart Cards Mobile Communication, and etc. **(3 Lectures)**

Computer Programming and Languages: Algorithm, Flow Chart, Pseudo Code Program Control Structures, Programming Languages, Generation of Programming Languages, and etc. **(4 Lectures)**

C Language: Basics, Constants, Variables and Data Types, Operators and expression Input & Output operations. **(8 Lectures)**

Control Structures: Decision Making & Branching, Decision Making & Looping. **(9 Lectures)**

Arrays: One & Two dimensional Array. **(3 Lectures)**

Functions: User defined functions, concept of recursion. **(6 Lectures)**

Text Books:

01. Introduction to Information Technology, by ITL Education Solution Ltd., Pearson Education
02. Programming in ANSI C by E Balagurusamy 4th Ed

Reference Books

01. Fundamental of Computer & IT By A. Jaiswal (Weily India)
02. Programming in ANSI C by Ashok N. Kamthane
03. The C programming Language, 2e, by Brian W. Kernighan & Dennis M. Ritchie PHI/Pearson Education
04. Programming with C by Gottfried. Tata McGraw Hill (Schaum's Series).
05. Mastering C by K. R. Venugopal, & S. R. Prasad, Tata McGraw Hill

Practical:

Working in Windows environment, Internet, C programming based on above syllabus.

(IT&CSE)

ME- 1202 Engineering Graphics

L-T-P: 2-0-3

Credits: 4

Introduction, drawing instruments, sheet layout, lines lettering, dimensioning, engineering curves. (Ellipse, parabola, hyperbola, spiral).

(Lectures: 10)

Orthographic projection: Projection of points, projection of straight lines. **(Lectures: 10)**

Projection of planes. **(Lectures: 5)**

Projection of solids. **(Lectures: 5)**

Section of solids. **(Lectures: 5)**

Development of surfaces. **(Lectures: 5)**

Intersection of surfaces. **(Lectures: 5)**

Isometric projection. **(Lectures: 5)**

Conversion of pictorial view into orthographic views. **(Lectures: 10)**

Introduction to Computer Aided Drawing.

(Lectures: 10)

Text Books:

1. Engineering drawing by N.D. Bhatt & V.M. Panchal, Charotar book publication, Anand.

PRACTICAL

Understanding the AutoCAD windows and the drafting tools, drawing 2D objects

L-T-P: 3-0-3

Introduction to C++: Object Oriented Technology, Advantage of OOP, Input-output in C++, Tokens, Keywords, Identifiers, Data Types C++, Derives data types, The void data types, Type Modifiers, Typecasting, Constant, Operator, Precedence Operators, Strings.

(Lecture: 3)

Control Structures: Decision making statement like if-else Nested if-else, go to, break continue, switch case, Loop statements like for loop, nested for loop, do-while loop, (Lecture: 3)

Function: Parts of Function, User-defined Functions, Value Returning Function, Void Functions, Value Parameters, Function overloading,

(Lecture: 3)

Classes and Data Abstraction: Structure in C++, Class, Built-in Operations on Classes, Objects (Variables), Member functions, Accessor and Mutator Functions, Constructors, default Constructor, Destructors,

(Lecture: 15)

Overloading & Templates: Operator Overloading, Function Overloading, Function Templates, Class Templates

(Lecture: 5)

Inheritance: Single & Multiple Inheritance, Virtual Base class, Abstract Class, Pointer and Inheritance, Overloading Member Function. Virtual function.

(Lecture: 5)

Pointers and Arrays: Void Pointers, Pointer to Class, Pointer to Object, The this pointer, Void Pointer, Arrays.

(Lecture: 6)

Exception Handling: The keywords try, throw and catch Creating own Exception Classes, Exception Handling Techniques (Terminate the Program, Fix the Error and Continue, Log the Error and Continue). Stack Unwinding.

(Lecture: 5)

Text Books:

1. Thinking in C++, Volume 1 & 2 by Bruce Eckel, Chuck Allison, Pearson Education,
2. Mastering C++, 1/e by Venu gopal, Tata McGraw Hill
3. Object Oriented Programming with C++, 3/e by E. Balagurusamy, Tata Mcgraw Hill
4. Starting Out with Object Oriented Programming in C++, by Tony Gaddis, Wiley India

Reference Book:

1. The C++ Programming language 3/e by Bjarne Stroustrup, Pearson Education
2. C++ How to Program, 4e, by Deitel, Pearson Education
3. Big C++ by Cay Horstmann, Wiley India.
4. C++ Primer, 3e by Stanley B. Lippman, Josee Lajoie, Pearson Education.
5. C++ and Object Oriented Programming Paradigm, 2e by Debasish Jana. PHI
6. Programming with C++ 2/e by Ravichandran, Tata McGraw Hill
7. C++ Programming Black Book by Steven Holzner, Dreamtech Press

Programming Lab (OOP)

Writing programs using classes and objects, constructors and destructors, Inheritance properties, Overloading operators, Use of pointers list representation. Programs and virtual functions, file handling, I/O manipulator using C++

IT

EC-1304 *Introductions to Communication Systems*

L-T-P: 3-0-3

Credit: 5

Periodic Signals (Sinusoidal, rectangular wave, Saw-tooth and triangular wave) and its Fourier series expansion with single side representation in real frequency domain and with double side Representation in rotating phasors domain. **(3 Lectures)**

Aperiodic signal-a signal pulse event and its Fourier Transform; Impulse Response of a linear time-Invariant System, Convolution and Response to arbitrary input. **(3 Lectures)**

Block Diagram of Communication System and Comparative study of Analog and Digital Communication. **(3 Lectures)**

Modulation (upward frequency translation) & Demodulation (downward frequency translation) and the need for modulation; Broad Classifications of Modulation [Linear (amplitude-AM) and Exponential (frequency-FM and phase-PM)]. **(3 Lectures)**

Generation of Double Side Band (DSB) with Carrier, Double Side Band with suppressed Carrier (DSBSC) and Single Side Band with suppressed carrier; Demodulation of Double side band (DSB) with Carrier – incoherent detector or envelope detector, peak diode detector, coherent or synchronous detection of DSBSC and Single Side Band with Suppressed carrier. **(6 Lectures)**

Analog Pulse Modulation – PAM, PWM, PPM and demodulation; Comparative study of various Analog Pulse Modulation; Comparison of incoherent and coherent detection.

(6 Lectures)

Superhetrodyne Receivers – Intermediate Frequency and its advantages, alignment and tracking, image rejection and IC version of the Receiver. **(3 Lectures)**

Frequency Multiplexing in carrier Telephony. **(1 Lectures)**

Generation of FM signals (direct and indirect methods) and demodulation. **(3 Lectures)**

Comparative study of SNR in AM, FM and PM System and use of emphasis Circuit in FM for SNR optimization.

(2 Lectures)

Television-block diagram of the transmitter and Receivers;	
Description and working of Videocon Camera; Description and working of B-W/colour TV receiver, description of the composite signals in B-W/colour TV.	(6 Lectures)
CCD, Flat Panel Displays	(3 Lectures)

Text Book:

1. Radio systems for Technicians by D. C. Green, Longman;

Reference Books:

1. Communication System by Bruce Carlson, TMH
2. Electronic Communication system by Kennedy, IV Edition, TMH.
3. Electronic communication by Roddey & Coolen, Pearson.
4. Telecommunication System Engg. By Freeman, John Wiley.
5. Communication System by Haykin, Wiley.

LABORATORY OF COMMUNICATION SYSTEMS

1. Use of Quadrant multiplier Chip for generating and synchronous detection of DSB with suppressed carrier.
2. Characterization and design of SAW Filter
3. Use of SAW filter as band pass filter for generating and synchronous detection of SSB with Suppressed carrier.
4. Characterization of ceramic or quartz filter and design of Band Pass Filters using crystal filters.
5. Pilot Carrier Insertion in SSB with suppressed carrier signal and generating a synchronous carrier by sensing the pilot using PLL chip and using this carrier for synchronous detection.
6. Realization of 2nd order and 4th order filter using Switch Capacitor Elements and making a . Comparative study of switched capacitor and conventional filters.

L-T-P: 3-0-3**Credit: 5**

Digital Principle – Analog vs Digital, Number system, Computer Codes, Digital Signals, Waveforms Positive and Negative logic, Gate: basic, universal and others, Truth Table, Logic functions, IC Chips, Timing Diagram, Electrical Analogy.

(4 Lecture)

Boolean Laws and Theorems – Logic Functions, conversion of Logic functions into Truth Table and Vice – versa. SOP and POS forms of representation, Min terms and max terms, Simplification of Logic functions by theorems and Karnaugh's Map. Don't care conditions, Design of Special Purpose Computers and related Practical problems

(5 Lecture)

Analysis and Synthesis of Combinatorial Logic Circuits – Adders and Substructures (look-ahead adders). Multiplexers, De-multiplexers, Encoders, Decoders, Code Converters, Magnitude Comparators, Parity generators and Checkers.

(6 Lecture)

Integrated Circuit Logic Families-RTL, DTL, TTL, CMOS, IIL/I²L. (Integrated Injection Logic & Emitter Coupled Logic).

(4 Lecture)

Sequential Circuit Blocks-Latches, Flip Flops- race around condition, Master-Slave and edge triggered, SR, JK, D & T Flip Flop, Shift Registers, Counters – Synchronous and asynchronous; design of ripple counter. **(10 Lecture)**

Timing Circuits: Multi-vibrators – Mono-stable and Astable Timer: LM555

(4 Lecture)

Use of basic building block in designing larger systems such as Digital to Analog Converters (DAC) – Weighted resistor and R-2R. Analog to Digital (ADC) – Comparator, Counter and Succession..

(4 Lecture)

Memories-static and dynamic RAMs, ROM, EPROM, and EEPROM

(5 Lecture)

Text Books:

1. Digital Systems – Principles & Applications by Tocci, Widmar and Jain, Pearson;
2. Digital Fundamentals by Floyd and Jain, Pearson;

References Books:

1. Fundaments of VHDL Design by Stephen Brown and Zovenkeo Vrasicic, TMH.
2. Introduction to Logic Design with CDROM by Alan N. Marcvity, TMH.
3. Fundamentals of Digital Logic with Verilog Design by Stephen Brown, TMH.
4. Modern Digital Electronics by R. P. Jain, TMH.

Practical:

Experiments Concerning verification and application of concepts defined in Syllabus

1. Verification of Basic Logic gates.
2. Verification of Universal gates
3. Half Adder
4. Full Adder
5. Multiplexer De-multiplexer.
6. SR, JK D & Flip-flops
7. Shift Register.
8. Counters
9. DAC Converter
10. ADC Converter

Ordinary differential equations & Special Functions:-
 Series solution of differential equations (Frobenius method), Bessel's equation, its solution, Bessel's function of first & second kind, Recurrence formula, Legendre's equation, its solution, Legendry Polynomials, Rodrigue's formula, Orthogonality of Legendre Polynomial. **(10 Lectures)**

Partial Differential equations: Liner differential equation of first order

Basic concept, 1st & 2nd order linear & quasi-linear partial differential equation, classification of 2nd order PDE., Boundary and initial conditions, 1. Lagrange's Linear equation 2. Non linear equation of the first order 3. Charpits Method 4. Homogeneous Linear Equation with constant coefficients 5. Method of separation of variables D'Alembert's solution of wave equation, Heat equation, solution by Fourier series. **(10 Lectures)**

Complex Analysis I:-

Function of complex variables- limit, continuity, differentiability and analyticity of functions Cauchy-Riemann equations, Laplace's equation, harmonic function, Cauchy's integral theorem, Cauchy's integral formula, Taylor's and Laurent series, Residues and its applications to evaluating real integrals. **(10 Lectures)**

Probability & Statistics:-

Theorems on Probability, including Baye's rule, Random Variable – cumulative distribution function, probability mass function, probability density function, mathematical expectation, mean, variance, moment, generating function & characteristic function, standard probability models- Binomial, Poisson exponential, weibull, normal and lognormal, Sampling & sampling distributions t, chi-square and F distributions. Large and small sample tests of significance. **(18 Lectures)**

Text Books:

1. Advance Engineering Mathematics-R.K.Jain & S.R.K. Iyenger, Narosa Publishing House.
2. Higher Engineering Mathematics – B.S. Grewal, Khanna Publishers.
3. Fundamentals of Mathematical Statistics- V.K.Kapoor & S.C.Gupta- Sultan & Sons.

Reference books:

1. Advance Engineering Mathematics- E.Kreyszig, 8th Edition, John Wiley & Sons New York
2. Complex Variables and Applications- Churchill & Brown- Mac Graw Hill
3. Elements of Partial Differential Equations- I.N.Sneddon- Mac Graw Hill
4. Introduction to Probability & Statistics for Engineers- S. M. Ross – John Wiley and Sons, New York.
5. function of a complex variable – Goal and Gupta

IT
HS-1303 INDUSTRIAL ECONOMICS &
ACCOUNTING

L-T-P: 3-0-0

Credit: 3

Various definition of Economics-Nature of Economic Problem,
Relation between Science, Engineering, Technology & Economics.
(3 Lecture)

Meaning of Demand, Law of Demand, Elasticity of Demand,
Practical importance & application of the concept of elasticity of
Demand. **(5 Lecture)**

Meaning of Production and factor of production-Land, Labour,
Capital, Entrepreneur & Organization-their characteristics, Law
of variable proportion, Return to Scale **(5 Lecture)**

Cost Analysis-various concept of cost, Cost function, Short &
Long run cost, Concept of Revenue, Break-Even Analysis.
(6 Lecture)

Meaning of Market- Type of market-Perfect Competition,
Monopoly, Oligopoly, Monopolistic competition (Main feature
of these market) Meaning of Supply and Law of supply, Role of
Demand & Supply in price determination imperfect competition.
(7 Lecture)

Engineering Economy :(a) Simple and compound interest,
Annuities (b) Basic methods for making economy studies- (c)
Comparison of alternative - (i) Present worth method (ii) Future
worth method (iii) I.R.R method (c) Comparison of alternative –
(i) Present worth method (ii) Future worth method (iii) I.R.R
method **(7 Lecture)**

Accounting: Meaning, Scope and Role of Accounting, Accounting
concept & convention, Accounting as an information system
Recording of transaction in Journal and Ledgers, Trial – Balance,
Preparation of final Account. **(9 Lecture)**

Text books:

1. H.L. Ahuja-Modern Micro Economic Theory-S.Chand
2. M.L.Jhingan-Advance Economic Theory-Konark Publication
3. Degarmo, Sullivan& Canada- Engineering Economics – Macmillan
4. Double Entry Book Keeping – T.S.Grewal- S. Chand

Reference books:

1. Stonier & Hague – A test book of Economic Theory – Pearson
2. Industrial Organisation and Engg. Economics- Banga& Sharma

EC-1302 Basic Electronics**L-T-P: 3-0-3****Credit: 5**

Passive Components & Signal sources.

[3**Lectures]**

Semiconductor Diodes – P-N Junction Diode, dc and incremental Parameters, DC Load- Line, Q point or DC Operating Point, Temperature Effect, Ideal Diode, incremental resistance, Small Signal Equivalent Circuit, Junction Capacitance & Diffusion Capacitance, Avalanche & Zener Breakdowns:

[4 Lectures]

Diode Applications – Half-wave & Full-wave Rectification, Center Tap & Bridge Rectifier, Filters Zero Voltage Regulation, Percentage regulation, PIV, Ripple Factor, R-C, L-C & π -filters, Voltage Doublers, Clipping & Clamping Circuits.

[8 Lectures]

Special Application Diodes: Photo-Diode, Light-Emitting-Diode (LED), Tunnel Diode, Varactor Diode, Schottky Diode,

[3 Lectures]

Bipolar Junction Transistor (CB & CE output and transfer characteristics, dc and incremental parameters) and its application- CE, CC, CB- DC Bias analysis and Incremental Analysis using simple hybrid-pi model.

[8 Lectures]

FET & MOSFET – Transfer and Output Characteristics of JFET, enhancement- MOSFET, depletion- MOSFET & Amplification Action in Common Source FET Amplifier; **[6 Lectures]**

Amplifiers – Multistage Amplifiers, Feed – Back Amplifier, its four topologies and its advantages; **[6 Lectures]**

Integrated Circuits-Ideal Operational Amplifier (Op-Amp), Applications as Inverting Amplifier, Non-Inverting Amplifier, Summer, Difference, Integrator and Differentiator and nonlinear application as precision rectifiers, logarithmic amplifiers and multi-vibrators.

[4 Lectures]

Introduction to – Wien Bridge, RC –phase shift, Hartley and Colpitts Oscillators

[6 Lectures]

Text Book

1. Electronic Devices & Circuit Theory by Boylestad and Nashelsky, Pearson;
2. Electronic Principles, Albert Malvino & Davis J. Bates, 7th Ed. TMH.
3. Art of Electronics by Paul H. Horowitz, Oxford;

References

1. Introduction to Electronic Circuit Design by Spencer, Pearson;
2. Device Electronics for Integrated Circuits by Muller & Kamins with Mansun Chan Wiley Student Edition
3. Principles of Electronics by V.K. Mehta, S.Chand
4. Electronic Circuit & System by R.J.Smith Wiley;

Basic Electronics Lab;

1. Introduction to DMM (Digital Multimeter);
2. Introduction to passive components (Resistance, capacitance and inductors)-specification and measurements of the actual values by DMM;
3. Introduction to Cathode Ray Oscilloscope (CRO)- Time period measurement, study of different Waveforms, measurement of frequencies of Sinusoidal wave forms by Lissajou's Figuer;
4. Introduction of connectors-multi-strand wires (connecting wires)& single strand wires (hook up wires) and bread boards;
5. Study of Output characteristics of Diode, BJT, FET, UJT & SCR;
6. Application of Diode, BJT, FET, UJT & SCR- Clipping & Clamping, Rectification, Rectification, RC coupled CE and CS FET Amplifiers, Relaxation Oscillator;
7. Application of UA 741-Inverting Amplifiers, Non-inverting Amplifiers Summer Amplifiers. Difference amplifiers, Integrator and Differentiators.

IT

MA-1405 Discrete Mathematical Structure & Graph Theory

L-T-P: 3-1-0

Credit: 4

Set, relation and function:-

Basic operation on sets, Cartesian product, disjoint union (sum), and power sets, Different types of relations, their compositions and inverses, Different types of functions, their compositions and inverses.

(6 Lectures)

Propositional logic:-

Syntax and semantics, connectives, connectives, conditional & biconditional connectives Functionally complete sets of connectives, Two-state Devices and Statement Logic, satisfiability tautology, normal forms Predicate calculus.

(6 Lectures)

Algebraic structure:-

Algebraic structures with one binary operation – semigroup. Monoid and group, Congruence relation, Permutation group.

(6 Lectures)

Partially ordered sets

Complete partial ordering, chain, lattice, Complete, distributive, modular, and complemented lattices, Boolean lattices, Sublattices.

(8 Lectures)

Introduction to Counting:-

Basic counting techniques- inclusion and exclusion, pigeon-hole principle permutation, combination, partition & distribution

(8 Lectures)

Introduction to Graph:-

Graphs and their basic properties- degree, regularity, subgraph, isomorphism, Connectedness-path & walk, circuits, cycles, component, connectivity, Bipartite graph, Tree, Kuruskal algorithm Prims algorithm, Eulerian and Hamiltonian graph, Graph colouring- vertex colouring, edge colouring planar graph.

(10 Lectures)

Text books:

1. Discrete Mathematics – R. Manohar & Tremblay – McGraw-Hill Book Co.
2. Discrete Mathematics (For Computer Scientist)- John Truss - Pearson Education

Reference Books:

1. Discrete Mathematics – Richard Hohnson Baugh
2. Discrete Mathematical Structures – Bernard Kolmar, Robert C Busby, Sharon Cutter Ross
3. Discrete Mathematics – Nborman L. Biggs – Oxford University, USA
4. Discrete Mathematics and Structures – Satindre Bal Gupta – Laxmi Publication Pvt. Ltd.
5. Set theory- S.N. Thakur

IT

CE-1402 Environmental Science

L-T-P: 3-0-3

Credit: 5

Unit 1: Humans and Sustainability, Ecology and Sustainability: Ecosystems. **(7 Lectures)**

Unit 2: Evolution of Biodiversity, Biodiversity & Climate; Population Ecology; Sustaining Biodiversity; Sustaining Resources Environmental Quality: Water and Water Pollution, **(8 Lectures)**

Unit 3: Sustaining Resources Environmental Quality: Air Pollution, Behavior and control of air and water pollutants; Hazardous and solid waste and pollution of groundwater and soil, Noise Pollution, Geology and nonrenewable Minerals, Energy. **(9 Lectures)**

Unit 4: Toxicological Chemistry and effects and risks of it on human health. **(6 Lectures)**

Unit 5: Environmental Chemical Analysis. **(6 Lectures)**

Unit 6: Policy and legislation for environmental protection, Current Environmental Issues. **(6 Lectures)**

Text Books:

1. Environmental Science, Miller, Thomson Press.

2. Environmental Chemistry, Sawyer and McCarty, Mc GrawHill.
3. Environmental Chemistry, Manahan Stanley E., Lewis Publishers.

Practical:

1. Case Analysis based on theory.
2. Determination of simple environmental parameters in laboratory.
3. Paper Presentation on current environmental issues.

IT

EE-1412 Microprocessor & its Application

L-T-P: 3-0-3

Credit: 5

Intel 8085

Introduction: CPU, Registers, Memory, Buses, Memory Addressing capacity of a CPU

(4 Lecture)

CPU Architecture Pin configuration, Instructions, Addressing Modes/Instruction Word Size, Languages.

(4 Lecture)

Timing Diagram, Read cycle, Write cycle, Fetchcycle, Memory Read, Memory Write, I/O cycle,

(3 Lecture)

Programming : Simple Programming : 8 - bit addition & subtraction, 16-bit addition, subtraction, delay, subroutine using register, finding lowers & highest no. in array

(5 Lecture)

Data transfer schemes, I/O ports **(6 Lecture)**

8255, 8251, 8253, 8257 chips, pin diagram, control word, operating modes **(6 Lecture)**

Interfacing to ADC, Analog multiplexer **(4 Lecture)**

Intel 8086

Architecture, BIU & Execution unit, Pin diagram, Function of different modes, Registers. **(4 Lecture)**

Addressing Modes, Instructions **(4 Lecture)**

Programming **(3 Lecture)**

Text Books:

1. Fundamentals of Microprocessors & Microcomputers
by B. Ram, Dhanpat Rai & Sons, Delhi
2. Advanced Microprocessor by B. Ram

Reference Books:

1. Microprocessors & Interfacing by B.B. Hall, TMH
2. Microprocessor Architecture, Programming and Applications with 8085/ 8086 A By Ramesh S. Gaonkar, Wiley Easter Ltd.
3. The Intel Microprocessors Architecture, Programming & Interfacing By B. B. Brey, PHI
4. Programming Microprocessor Interfaces for control & Instrumentation by Michael Andrews, PHI, Engle Wood Cliffs, New Jersey.
5. Microprocessors with Application in Process Control
by S.I, Ahson, TMH, New Delhi

Introduction: Purpose of database systems, View of data, data models, & interface, Database language, transaction management, storage management, database administrator, database users, overall system structure, Classification of Database Management System, Three- Schema Architecture.

(Lecture: 3)

Data Modeling: Entity- Relationship Model, Basic concepts, design issues, mapping constraints, keys, E-R diagram, weak entity sets, extended E-R features, design of an E-R database schema, reduction of an E-R schema to tables.

(Lecture: 5)

Relational Model: Structure of relational databases, relational algebra, tuple relational calculus, domain relational calculus, extended relational-algebra operations, modification of the database and view, SQL and Other.

(Lecture: 5)

Relational Languages: Background, basic structure, set operations aggregate functions, null values, nested sub-queries, derived database, joined relations DOL embedded SQL and other SL features, query-by-example.

(Lecture: 5)

Integrity Constraints: Domain constraints, referential integrity, assertions triggers and functional dependencies.

(Lecture: 3)

Relational Database Design: Pitfalls in relational database design, decomposition, normalization using functional, multi-valued and join dependencies, domain key normal form and alternative approaches to database design.

(Lecture: 5)

Query Processing: Overview, catalog information for cost estimation, measures of query cost, selection operation, sorting, join operation, other operations, evaluation of expressions, Translating SQL query into Relational Algebra, transformation of relational expressions, Query Optimization.

(Lecture: 8)

Transactions: Transaction concept, transaction state, system log, Commit point, Desirable Properties of a Transaction, concurrent executions, serializability, recoverability, implementation of isolation transaction definition in SQL, Testing for serializability

(Lecture: 8)

Text Books:

1. Database System Concepts 3rd edition, by A.Silberschatz H. F. Korth, & S. Sudhatshan, McGraw Hill,
2. Fundamental of Database Systems, by Elmasri, Navathe, Somayajulu, and Gupta, Pearson Education.
3. An Introduction to database system by C. J. Date, A. Kanana, S. Swamynathan, Pearson Education

Reference Books:

1. Database management System, by Rajesh Narang. PHI
2. Database Systems by Rob, COronel, Galgotia Publication.

IT
CS-1403 Data Structures

L-T-P: 3-0-3

Credit: 5

Introduction to algorithm: Analysis for time and space requirements. (Lecture: 2)

Linear Data Structures and Their Sequential Representation: Array, Stack, queue, circular queue and their operation's and applications. (Lecture: 7)

Linear Data Structures and Their Linked Representation: Linked linear list, circularly linked linear list, Doubly linked list, linked stack, linked queue and their operations and applications (Lecture: 10)

Nonlinear Data Structures: Binary trees, binary search trees, representations, operations, thread representations, sequential representation, traversals, applications, B-tree, Operation on B-tree, AVL Search tree and operations, Huffman Algorithm, Height Balanced Tree. (Lecture: 14)

Sorting and Searching: Bubble Sort, Insertion Sort, Selection Sort, Heap Sort, Quick Sort, Radix Sort, Linear and Binary search, Union-Find, Hashing methods, etc. (Lecture: 10)

Text Books:

1. Data Structure Using C by ISRD Group, Tata McGraw Hill
2. Data Structures by Lipschutz & Pai, Tata McGraw Hill.

3. Data Structure using C and C++ by Langsam, Pearson Education
4. Data Structures by E. Horowitz and S. Sahni
5. Data Management & File Structures, 2e, by Mary E.S. Loomis, PHI.
6. Data Structures & Algorithm Analysis in C++, 2e, by Mark Allen Weiss, Pearson Education.
7. An Introduction to Data Structures with application, Second Edition, by J. P. Tremblay and P.G. Sorenson, Tata McGraw Hill.

Reference Books:

1. Data Structures using Java by Langsam, Moshe Augenstein, and Aaron M. Tenenbaum.
2. C and Data Structures by P.S. Despande. Wiley India

IT
CS-1402 Computer Architecture

L-T-P: 3-0-0

Credit: 3

Introduction: Computer Arithmetic, Instruction sets,
Introduction to computer organization, CPU Design.

(Lecture: 8)

Micro programmed Control: Control Memory, Address
sequencing, Micro program example.

(Lecture: 5)

Memory and Input-Output Subsystems: Hierarchical
memory structure, Cache memories, Set Associative memory,
Virtual Memory, Paging, Segmentation, Input-Output
Interface, Asynchronous Data Transfer, Programmed I/O,
Interrupts, Direct Memory access.

(Lecture: 15)

Introduction to Parallel Procession: Evolution of computer
systems (RISC vs. CISC), Parallelism in uniprocessor
systems, Architectural classification schemes.

(Lecture: 5)

Principles of Pipelining and Vector processing: Pipelining,
Overlapped Parallelism, Principles of designing Pipelined
processors, Vector Processing Requirements.

(Lecture: 5)

Structures & Algorithms for Array Processors: SIMD

Array processors, SIMD Interconnection networks

(Lecture: 4)

Text Books:

- 1.** Computer System Architecture. 3e by M. Morris Mano, Pearson Education.
- 2.** Computer Architecture and parallel processing by Kai Hwang, Briggs, McGraw Hill
- 3.** Computer Architecture by Carter, Tata McGraw Hill.
- 4.** Computer System Organization & Architecture by John D. Carpinelli, Pearson Education.

CS 1512 Formal Languages and Automata Theory

L-T-P: 3-0-0

Credit: 3

Introduction to Automata: Study and Central concepts of automata theory. An informal picture of Finite automata, deterministic and non-deterministic finite automata, application of finite automata, finite automata with epsilon transitions.

(Lecture:3)

Regular Expression and Languages: Regular expression, finite automata and regular expressions, applications of regular expressions, algebraic laws of regular expressions.

(Lecture:6)

Properties of Regular Language: Proving languages not to be regular, closure properties of regular languages, equivalence and minimization of automata.

(Lecture:4)

Context-free Grammars and Languages: Parse trees, Applications of context free grammars, Ambiguity in grammars and languages,

(Lecture:6)

Pushdown Automata: Pushdown (PDA), the language of PDA, equivalence of PDA's and CFG's, deterministic pushdown automata.

(Lecture:6)

Properties of Context-Free Languages: Normal forms of context free grammars, pumping lemma for context free languages, closure properties of context free languages.

(Lecture:5)

Introduction to Turing Machine: The Turing machine, programming techniques for Turing machine, extensions to the basic Turing machine, restricted Turing Machines, Turing machines and Computers Undecidable Problem about Turing Machine, Post's Correspondence Problem.

(Lecture:7)

Intractable Problem: The Classes P 7 NP, NP-Complete Problem, Example of P & NP Problem

(Lecture:5)

Text Books:

1. Introduction to Automata Theory Languages and Computation, 2e, by Johan E. Hopcroft, Rajeev Motwani, and Jeffery D. Ullman, Pearson Education
2. Theory of Computer Science (Automata, Languages and Computation), 2e, K. L. P. Mishra and N. Chandrasekharan. PHI

EC 1505

**IT
ANALOG ELECTRONICS**

L-T-P: 3-0-3

Credit: 5

Four Ideal Amplifiers- Ideal Voltage Amplifiers, Ideal current Amplifiers, Ideal Transresistance Amplifiers and Ideal Transconductance Amplifiers and Distortions (Amplitude or Harmonic Distortion, Frequency Distortion and Distortion); **[4 Lectures]**

Mid frequency Analysis of CB, CE & CC amplifiers using Hybrid Model (*Chapter 8 Integrated Electronics by Millman & Halkias*);

Low and High Frequency analysis of CB, CE & CC (*Chapter 11 and Chapter 12 exec Section 12- 10 and 12-11*),

Rise time method for determination of f_h using the formula of $t_r f_h = 0.35$ and 10% sa method for the determination of f_{lower} using sag method **[15 Lectures]**

Bootstrapping in Emitter Follower, Darlington Pair Amplifier, Cascade Amplifier, CC- CB Cascade; **[4 Lectures]**

Multistage Amplifiers & Band Width Shrinkage in multistage amplifiers **[3 Lectures]**

Incremental Model of FET and incremental analysis of Common Source at Low & High Frequencies **[3 Lectures]**

Noise & Noise Figure in Amplifiers- Thermal Noise, Shot Noise, Flicker Noise, Friss Formula; **[4 Lectures]**

Class A, Class B and Class Power amplifiers with reference to Complementary Symmetry Amplifiers; **[5 Lectures]**

References

1. Introduction to Electronic Circuit Design by Spencer, Pearson;
2. Device Electronics for Integrated Circuits by Muller & With Mansun Chan, Will Student Edition
3. Principles of Electronics by V. K. Mehta & Rohit Mehta, Chand
4. Electronic Circuit & System by R.J. Smith, Wiley;

Basic Electronics Lab:

1. Introduction to DMM (Digital Millimeter);
2. Introduction to passive components (resistance, capacitance and inductors)- specification and measurements of the actual values by DMM;
3. Introduction to Cathode Ray Oscilloscope (CRO)- Time period measurement, study different Waveforms, Measurement of frequencies of Sinusoidal wave forms by Lissajou Figure;
4. Introduction to connectors –multi-strand wires (connecting wires)& single strand wires(hook up wires) and bread boards;
5. Study of Output characteristics of Diode, BJT, FET, UJT & SCR;
6. Application of Diode, BJT, FET, UJT & SCR- Clipping & Clamping, Rectification, Coupled CE and CS FET Amplifiers Relaxation Oscillator;
7. Application of new A 741-Inverting Amplifiers, Non-inverting Amplifiers, Summer Amplifiers Difference Amplifiers, Integrator and Differentiators;

Text Book:

1. Lab Manual by Mahaeshwari, PHI;

L-T-P: 3-0-3

Introduction to Compilers: Compilers and translators, the phases of a compiler, Compiler writing tools, The Lexical and Syntactic structure of a language, operators, Assignment statements and parameter translation.

(Lecture:2)

Lexical Analysis: The role of the lexical analyzer, Specification of tokens, lexical analysis tool.

(Lecture:2)

Syntax Analysis: Role of Parser, CFG, Top-down parsing, bottom-up parser, Operator-precedence parsing, LR Parsers, The Canonical Collection of LR (0) items, Construction SLR, Canonical LR, and LALR parsing tables, Use of ambiguous grammars in LR parsing, An automatic parser generator, Implementation of LR parsing tables, and constructing LALR sets of items.

(Lecture:10)

Syntax Directed Translation: Syntax tree, Bottom-up evolution of S-attributed definitions, L-attributed definition, top-down translation, Bottom-up evaluation of inherited attributed, Recursive evaluators.

(Lecture:5)

Type Checking: Static vs. Dynamic Checking, Type expression, Type Checking, Type Equivalence, Type Conversion.

(Lecture:2)

Symbol Tables: Structure of Symbol Table, Simple Symbol Table (Linear Table, Ordered List, Tree, Hash Table), Scoped Symbol Table (Nested Lexical Scoping, One Table per Scope, One Table for all Scopes).

(Lecture:3)

Intermediate Code Generation: Intermediate Language, Intermediate representation Technique, Three-address code, quadruples and triples, Translation of assignment statements, Boolean expressions, Control Flow, Case Statement, and Function Call.

(Lecture:4)

Code Generation: Factors affecting code generation, Basic Block, Code generation for tree, Register Allocation and assignment, DAG representation, Code Generation using dynamic programming, Code-Generator generators.

(Lecture:4)

Error Detection and Recovery: Errors. Lexical- Phase errors, Syntactic- Phase errors Semantic errors.

(Lecture:2)

Code Optimization: Need for optimization, Optimization of Basic Blocks, Loops in flow graph, Optimizing transformation (Compile time evaluation, common sub-expression elimination, Variable Propagation, Code Movement Optimization, Strength Reduction, Dead code optimization, Loop Optimization), Global Optimization, Computing Global data flow equation, Setting up data flow Equations, Iterative Data Flow Analysis.

(Lecture:10)

Text Books:

1. Compilers: Principles, Techniques. and Tools by Alferd V. Aho Ravi Seethi, Jeffery D. Ullman, Pearson Education.
2. Compiler Design by Santanu Chattopadhyay, PHI

Reference Book:

1. Modern Compiler Design by Dick Grune, E. Bal, Ceriel J.H. Jacobs, and Ken G. Langendoen. Wiley Dreamtech.

Programming Lab (Compiler Design):

Design of lexical analyzers. Design of parsers like recursive-descent parser for a block structured language with typical constructs. Typical exercises using LEX and YACC. Quadruples/Triples generation using LEX and YACC for a subset of a block structured language, LR (0), SLR, LALR error detection, and recovering with code optimization.

L-T-P: 3-0-3

Web Introduction: Domain name, IP Address concepts, World Wide Web (Lecture:3)

HTML & CSS: Introduction to HTML, Tags, Commands, Formatting web page, Font Tag, Links and Listings, Images and its Mapping Tables, Frameset Definition, Forms, Cascading Style sheet (CSS). (Lecture:10)

JavaScript: Introduction, data types, variables, operators, Array Objects, Date Objects, String Objects, Document Object Model, Image Object, Event Handling, Browser Object, Window Object, Location Object, History Object, Submit event and data validation. (Lecture:8)

Dynamic Hypertext markup language (DHTML): Introduction DHTML, Dragging and Dropping data, working layers. (Lecture:8)

Java Fundamental: Introduction to Java, Java and the Internet, Data type, Variables, Operators, Strings, Input and Output, Control Flow, Arrays., Object and classes, members of classes, Inheritance, Interfaces. (Lecture:8)

Graphics and Applet Programming in Java: Introduction to Abstract Window Toolkit (AWT) and Swing, Event Handling, Working with Text input, Choice Components, Menus Dialog Boxes. Applets and deploying Applets with HTML, Jar Files, Exception Handling, Introduction to Multi- Threading in Java (Lecture:8)

Database Programming: JDBC API. (Lecture:2)

Text Books:

1. HTML Black Book By Steven Holzner(Wiley India)
2. JAVA – How To Programm, by Deitel & Deitel, (Pearson)

Reference Books:

1. HTML, CSS, Java Script, Perl, Python & PHP
(Web Standard Programming Reference) BY
(Wiley India)
2. JAVA: The Complete Reference, J2SE, 5/e, by
Schildt (TMH)
3. Web Programming by Bates, Wiley
4. Core Java TM Volume I & II by Cay S. Horstmann
& Gary Cornell (Pearson)
5. Internet & WWW How to Program by Deitel
& Deitel, (Pearson)
6. HTML & XHTML: The Complete Reference
by Powell, (TMH)

Practical:

Programming based on above syllabus

CS 1514 Computer Networks**L-T-P: 3-0-0****Credit: 3**

Introduction: Network Hardware & Software, OSI Reference Model, TCP/ IP Model, Comparison of the OSI & TCP/ IP model. **(Lecture:2)**

The Physical Layer: Guided Transmission Media, Physical Layer Standard. **(Lecture:2)**

The Data Link Layer: Need for Data Link Control, Service Provided by the Data Link Layer, Frame Design Consideration, Flow Control Mechanism. Data Link Error Control in Stop-and-wait Mechanism & Sliding Window Mechanism, Sequence numbering, Piggybacking Acknowledgements, Data Link Management. **(Lecture:8)**

MAC Protocols: Random Access Protocols – ALOHA. **(Lecture:2)**

IEEE 802.3 Ethernet: Contention Access, CSMA, CSMA/CD, Physical Topology of Ethernet, Ethernet Repeater, Types of Ethernet. **(Lecture:5)**

Bridges and Layer-2 Switches: LAN Bridge , Transparent Bridges, Spanning Tree Algorithm, Source Routing Bridge, Route Discovery in Source Routing, Layer 2 Ethernet Switches, **(Lecture:5)**

The Network Layer: Network Layer Design Issue, Purpose of Network Layer, Functions of the Network Layer. **(Lecture:5)**

Introduction to Internet Protocol: IPv4 Format, ICMP. **(Lecture:2)**

Routing Algorithms: Static Routing, Dynamic Routing, Distance Vector Routing Algorithm, Routing Information Protocol, Link State Routing, OSPF Routing Protocol, Interior and Exterior Protocol, and Border Gateway Protocol. **(Lecture:10)**

Introduction to Transport Layer: TCP & UDP. **(Lecture:1)**

Introduction to application Layer: TCP/IP Application Protocol. **(Lecture:1)**

Text Books:

1. Data Communication & Networking by Forouzan, Tata Mcgraw Hill.
2. Computer Network, 4e by Andrew S. Tanenbaum, Pearson Education / PHI
3. Data Communication and Computer Networks, by Prakash C. Gupta, PHI
4. Networking All-In -One Desk Reference by Doug Lowe, Wiley Dreamtech

Reference Books:

1. Computer Networking: A Top-Down Approach featuring the Internet, 3e by James F. Kurose
2. Computer Network by Godbole, Tata Mcgraw Hill.
3. Computer Networking, by Stanford G. Rowe, Marsha L. Schuh

CS 1505

IT
Systems Programming

L-T-P: 3-0-3

Credit: 5

Introduction: System software and its components.

(Lectures:2)

Assemblers: Elements of assembly language programming, Assembly process Dependent Assembler, Machine-Independent Assembler, Design of multi, 2-pass assembler single pass assembler (Lecture:10)

Macros and Macro Processor: Macro definition and call Macro expansion, Nested Macro Calls, Design of a Macro preprocessor. (Lecture:8)

Loaders & Linkers: Basic Loader Function, Machine-dependent Loader, Machine –Independent Loader, Loader Design Option, Absolute Loader, Bootstrap Loader, Relocation and linking concepts, Design of a linker, self Relocating Programs and Overlay structure.

(Lecture:8)

Compiler: Machine-Dependent Compiler, Machine-independent Compiler, Compiler Design Options (Interpreter, P-code Compiler), Compiler-Compiler, Case study of Compiler. (Lecture:10)

Software Tools: Software Tools for Program Development, Editors, Debug Monitors, Programmes, Environments user Interfaces. (Lecture:2)

Text Book:

1. System Software: An Introduction to Systems Programming (3rd Edition) by Leland L. Beck, Pearson Education.
2. Systems Programming – John J. Donovan.
3. Systems Programming and operating and operating systems – D.M. Dhamdere.
4. IBM PC assembly language & programming by Peter Abel, Niyaz Nizamuddin, Pearson Education.
5. Assembly Language Programming for IBM PC Family by William B. Jones, Dreamtech Press.

Programming Lab (System Programming)

Symbol table (Tree Storage) construction, Implementation of single pass, two pass Assembler, Macro Preprocessor, module binder (with Limited instruction set). Implementation of software tools like Text editor, Interpreter, Program generator etc.

Introduction: Why AI, Importance of AI, LISP, Prolog and other programming language fore AI. **(Lecture: 3)**

Search strategies: Representation Scheme, Blind Search technique, Heuristic Search technique, algorithm, monotone restriction – Specialized production systems – AO* algorithm, **(Lecture:15)**

Searching game trees: Minimax procedure, alpha-beta pruning - Introduction to predicate calculus – Resolution refutation systems – Answer extraction, **(Lecture: 4)**

Knowledge representation, reasoning: Knowledge representation, Knowledge acquisition, Logical Representation scheme, Procedural representation scheme, network representation scheme, STRIPS robot Problem solving system, Structured representations of knowledge (Semantic Nets, Frames, Scripts) KRR system, KR language, Domain modeling, Semantic net.

(Lecture: 8)

Uncertainly: Non monotonic & monotonic reasoning, confidence factors, Bates theorem, Deimpster & Shafer's Theory of evidence, non-classical logic, Fuzzy reasoning. **(Lecture: 6)**

Natural language processing: An Introduction to Natural language Understanding, Perception, Learning.

(Lecture: 4)

Applications of Artificial Intelligence: AI in E-commerce, AI in E-tourism, AJ in Industry, AI in Medicine.

(Lecture: 2)

Text Books:

1. Introduction to Artificial Intelligence by Rajendra Akerkar, PHI
2. Introduction to Artificial Intelligence by Eugene Charniak, Pearson Education
3. Artificial Intelligence by Rich & Knight, Tata McGraw Hills.
4. Introduction to Artificial Intelligence & Expert system by Dan W. Patterson PHI

Reference Books:

1. Artificial Intelligence: A Modern Approach by Stuart Russell, Peter Norvig, and Pearson Education.
2. Introduction to Expert System, Peter Jackson, Pearson Education.
3. Artificial Intelligence application programming by M. Tim Jones, Dreamtech Press

Programming Lab (AI)

Implementation in all algorithms in LISP/ Prolog.

IT
(IT- 1608) Visual Programming

L-T-P: 3-0-3

Credits: 5

Introduction: Introduction to .NET Architecture, Feature of Visual Studio .NET. **(Lecture:4)**

C#: Introduction to C#, C# Program Outline, Variables and Expression, Flow Control Functions, Debugging and Error Handling, Object-Oriented Programming in C#, Classes Objects, Defining Class Members. **(Lecture:10)**

Collections, Comparisons, Conversions, Generics, OOP including Inheritance, Overloading Overriding, delegates and other Language Keywords. **(Lecture:8)**

Windows Programming: Windows Programming Overview, Windows Forms, Menu Common Dialogs & other Basic controls for UI design, deploying Windows Applications. **(Lecture:8)**

Data Access: File System Data. , XML, Databases and ADO.NET, Data Binding **(Lecture:4)**

Web Programming: MS Web programming model, Using ASP.NET Objects (Session application, request, response) for accepting user input, session tracking & other fundamental operations, Advanced Web Programming With database handling , Introduction to Web Services, Deploying Web Applications, NET Assemblies. XML Documentation Networking, Introduction to GDI+. **(Lecture:14)**

Text Books:
Beginning Visual C# 2005 By Karli Watson, Christian Nagel, Wiely India
Microsoft Visual C# .NET – STEP by STEP by SHARP & JAGGER Microsoft / PHI

Reference Books:

Professional C# 2005 by Christian Nagel, Bill Evgen, Wiely India
The Complete Reference C# 2.0 By Schildt, TMH

IT

Software Engineering

IT-1614

L-T-P: 3-0-0

Credits: 3

Introduction:, S/W Engineering Discipline-Evolution & Impact, Program vs S/W Product, Emergence of S/W Engineering.

(Lectures: 2)

Software Life Cycle Models: Waterfall, Prototyping, Evolutionary, Spiral Models and their comparisons

(Lectures: 4)

Software Project Management: Project Manager responsibilities, Project Planning, Project Size Estimation Metrics, Project estimation Techniques, COCOMO, Staffing Level Estimation, Scheduling, Organization & Team Structures, Staffing, Risk Management, S/W Configuration Management.

(Lectures: 10)

Requirements Analysis and Specification: Requirement Gathering and Analysis, SRS, Formal System Development Techniques, Axioma and Algebraic Specification

(Lectures: 4)

Software Design: Overview, Cohesion and Coupling, S/W Design Approaches, Object-Oriented vs Function-Oriented Design.

(Lectures: 4)

Function-Oriented S/W Design: SA/SD Methodology, Structured Analysis, DFDs, Structure Design, Detailed Design, Design Preview

Object Modelling Design UML: Overview, UML, UML Diagrams, Use Case Model, Classes Diagrams. **(Lectures: 8)**

Object-Oriented Software Development: Design Patterns, Object-Oriented analysis Design Process, OOD Goodness Criteria.

(Lectures: 3)

User Interface Design: Characteristics, Basic Concepts, Types, Components Based Development User Interface Design Methodology. **(Lectures: 3)**

Coding and Testing: Coding, Code Review, Testing, Unit Testing, Black Box Testing, Box Testing, Debugging, Program Analysis Tools, Integration Testing, System Testing, Gen Issues.

(Lectures: 10)

Software Reliability and Quality Management: S/W Reliability, Statistical Testing, Quality, S/W Quality Management System, ISO 9000, SEI CMM, Personal Software Product Six Sigma.

(Lectures: 5)

Computer Aided Software Engineering: CASE and its Scope, Environment, Support, Characteristics.

(Lectures: 2)

Software Maintenance: Characteristics, S/W Reverse Engineering, S/W Maintenance Product Models, Estimation of Maintenance Cost

Software Reuse: Basic Issues, Reuse Approach, Reuse at Organization Level.

(Lectures: 5)

Text Books:

1. Fundamentals of Software Engineering by Rajib Mall, PHI
2. Software engineering by James F. Peters, Wiley
3. Software engineering A Practitioner's Approach by Pressman, MGH

Reference Books:

1. Software Project Management From Concept to Deployment By Kieron Concept dreamtech Press
2. Software engineering, by Sommerville, Pearson education
3. Software engineering, by Jawadekar,

L-T-P: 3-0-0**Credits: 3**

Fundamentals: Three concept view, Supervised learning, Unsupervised clustering, Data Mining or Data Query, Expert System or Data Mining?, A simple data Mining Process Model, Data Mining Strategies, Supervised Data Mining techniques, Association Rules, Clustered Techniques, Evaluating Performance.

(Lectures: 8)

Basic Data Mining Technique: Decision Trees, Generating Association Rules, K-Mear Algorithm, Genetic learning, Choosing Technique, An Excel-based Data Mining Tool: iData Analyzer.

(Lectures: 8)

Knowledge Discovery in Databases: KDD Process model, Noisy data, Missing data, Data Transformation, CRISP-DM process Model.

(Lectures: 8)

Data Warehousing: Operational Database, Data warehouse design, OLAP, Excel Pivot Table for data analysis.

(Lectures: 4)

Formal Evaluation Techniques: Evaluation criteria, Tools, Computing Test Set Confidence Intervals, Comparing Supervised Learner Models, Attribute Evaluation, Unsupervised Evaluation Techniques.

(Lectures: 6)

Neural Networks: Feed – Forward Neural Networks, NN Training, Building Neural Network with iDA.

(Lectures: 4)

Statistical Techniques: Linear Regression Analysis, Logistic Regression, Bayes Classified Clustering Algorithm, Query and Visualization Techniques, Machine Learning and Statistical Techniques.

(Lectures: 8)

Specialized Techniques: Time Series Analysis, Mining the Web Mining Textual Data Improving Performance .

(Lectures: 4)

Text Books:

1. Data Mining: A tutorial-based Primer, by Richard J. Roiger, Michael W. Geatz, Pearson Education
2. Data Mining Introductory & advanced topic, by Margaret H. Dunham, Pearson Education

Reference Books:

1. Data Warehousing, Data Mining & OLAP by Berson/ Smith, TMH
2. The Microsoft Data Warehouse Toolkit: With SQL server 2005 and the Microsoft business Intelligence toolset by Ralph Kimball, Wiley India
3. Building the Data warehousing by W. H. Inmon, Wiley India
4. Data Warehousing: Design, Development & best practices. by Soumendra Mohanty, McGraw Hill.

IT
IT-1606 Operating Systems

L-T-P: 3-0-3

Credits: 5

Introduction: Introduction to OS. Operating System functions, evaluation of O.S., Different types of O.S., batch, multi-programmed, time-sharing, real-time, distributed, and parallel.

(Lectures: 4)

Processes: Concept of processes, process scheduling, operations on processes, inter-process communication, Communication in Client-Server Systems, overview & benefits of threads.

(Lectures: 5)

Process Scheduling: Scheduling criteria, preemptive & non-preemptive scheduling, scheduling algorithms.

(Lectures: 4)

Process Synchronization: Background, critical section problem, critical region, synchronization hardware, classical problems of synchronization, semaphores.

(Lectures: 8)

Deadlocks: System model, deadlock characterization, methods for handling deadlocks, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock.

(Lectures: 5)

Memory Management: Background, logical vs. physical address space, swapping, contiguous memory allocation, paging, segmentation, paging, segmentation.

(Lectures: 8)

Virtual Memory: Background, demand paging, page replacement, page replacement algorithms allocation of frames, thrashing

(Lectures: 6)

File Systems: File concept, access methods, directory structure.

(Lectures: 3)

Disk Management: Disk structure, disk scheduling (FCFS, SSTF, SCAN, SCAN)

(Lectures: 3)

Text Books:

1. Operating System Principles by Silberschatz A and Peterson J.L., Wiley
2. Operating Systems by Dhamdhere, TMH

References:

1. Operating Systems by Deitel, Deitel & Choffnes.
2. Operating Systems by Stalling, Pearson

Practical:

Familiarization with UNIX / Linux and Windows
Operating Systems

List of experiment

1. Study Experiment- UNIX basics
2. Basic Shell Programming (Fibonacci Series generation, Factorial of a given number, Checking for Armstrong number)
3. Designing a Arithmetic calculator
4. Generation of Multiplication table
5. Base Conversion (Decimal to Binary, Binary to Decimal)
6. Checking for a palindrome of a number
7. Finding the information about the Login name and File name
8. Students Evaluation
9. Process Creation (Basics, Arithmetic operations on processes, Displaying process ID,)
10. System calls (Usage of Link (), Usage of dup (), Renaming a file)

IT
**(CS- 1606)Design and Analysis of
Algorithms**

L-T-P: 3-0-0

Credits: 3

Introduction: Algorithm, performance evaluation of algorithms, space & time complexity, notion of optimality.

(Lecture: 5)

Divide and Conquer: Finding the maximum and minimum – Quick Sort – Selection – Strassen's matrix multiplication, etc

(Lecture: 4)

Greedy Algorithm: Knapsack Problem, (-1 Knapsack, Fractional Knapsack), Activity selection problem, Huffman's Codes, Minimum Spanning Tree, Kruskal's Algorithm, Prim's Algorithm, Dijkstra's Algorithm, etc. **(Lecture: 6)**

Dynamic Programming: Knapsack problem DP solution, Activity selection problem DP solution, All pairs shortest path, Traveling salesman problem. **(Lecture: 4)**

Randomized Algorithms and Amortized Analysis: Basis idea of randomized Algorithms (Las Vegas and Carlo types). Simple examples (Randomized Quick sort and its analysis, min-cut algorithm and its analysis) Amortized analysis and its significance (Illustration thorough examples). **(Lecture: 6)**

Graph Algorithms: Breadth First search (BFS), Depth First Search (DFS), strongly connected components, Euler Tour, Minimum spanning Tree, Kruskal's Algorithm, Prim's Algorithm, single source shortest path. **(Lecture: 14)**

Introduction to NP- Completeness: Basis concepts.

Reference:

1. The Design and Analysis of computer Algorithms by A.V. Aho, JE Hipcroft and JD Ullman, Pearson Education.
2. Algorithm- Introduction to Design and Analysis by S. Base Pearson Education.
3. Algorithms and complexity, by H.S wilf, PHI

Minor Project

IT-1681

L-T-P: 0-0-3

Credits: 2

Student need to do a Mini Project Work.

IT
IT- 1709 Information Security

Credits: 3

L-T-P: 3-0-0

Information and Security Planning: Introduction to Information Theory, Threat Agents and Risk Information and the Law, Information Security Planning Model

Lectures: 12

Cryptographic Principles and Methods: Cryptographic Philosophy, Mathematical Principles of Cryptography, Symmetrical Key Cryptography, Public Key Infrastructure

Lectures: 9

Information System Security : Securing the Information System Viruses, Worms, and Malicious Software **Lectures: 8**

Text Books:

01. Information Security Intelligence: Cryptographic Principles & Applications by Calabrese, Thomson

Reference Books:

01. Information Security Principles & Practice by Mark Stamp, Wiley
02. Introduction to computer Security by Bishop and Venkatramanaya, Pearson Education
03. Cryptography and Network Security: principles and Practice by Stallings, PHI

IT- 1713

**IT
Distributed Computing & its
applications**

L-T-P: 3-0-3

Credits: 5

Introduction to Distributed Computing Systems: Different Forms of Computing Distributed Computing Paradigms

Lectures:6.

Java & Distributed Computing: Socket API(TCP and UDP based Sockets). Remote Invocation (RMI), introduction to Remote procedure Call. RPC implementation in java RMI, Concept of CORBA.

Lectures:6

Understanding Servlet Programming: Using Servlets, its life cycle. Deploying Serlets, Web Server. Working with Request and Response Object. Understanding Servlet Session tracking mechanism.

Lectures:8

Understanding of JSP: Understanding the web page life cycle in JSP. JSP Document Elements. JSP Tag extensions. Tag libraries and its validation.

Lectures:6

Working with Enterprise Java Beans: EJB Overview.
Client View of a Session Bean, Session Bean Component Contract, Session Bean Lifecycle, Client View of an Entity, Component Contract for Container-Managed Persistence (CMP), CMP Entity Bean Lifecycle, Entity Bean EJB-QL, Message-Driven Bean Component Contract, Transactions, Exceptions, Enterprise Environment, Security Management

Lectures:12

Text Book:

01. Distributed Computing – Principles and Applications
M.L.Liu (Pearson Education)
02. JAVA – How To Programme, by Deitel & Deitel
03. J2EE 1.4 Bible By McGovern (Wiley India)

Reference Book:

01. Java Server Programming (Black Book)(Dreamtech Pres.)
02. The J2EE tutorial 2/e by Bodoff, (Sun-Pearson Education Asia)

IT-1725

IT
**Wireless & Mobile
Communication**

L-T-P: 3-0-0

Credits: 3

Wireless Transmission: History, Overview, Signals, Antennas, Signal Propogation Multiplexing, Modulation, Spread Spectrum.

Media Access Control : MAC, SDMA, TDMA, CDMA,
Spread Aloha Multiple Access. **Lectures:7**

Telecommunication System: GSM, DECT, TETRA.
Lectures:4

Wireless LAN: Infrared Vs Radio Transmission, IEEE 802.11 standard, Concept of HIPERLA and Bluetooth technology.

Lectures:8

Mobile Technology: Mobile-IP, Mobile transport layer, Mobile TCP, Concept of WAPWML.

Lectures:6

J2ME: Overview, Small computing technology. Its architecture and development environment, Lifecycle, MIDP, Commands, Items and Event processing, High Level display screen and low level display screen

Lectures:6

Text Books:

01. Mobile Communication 2/c
By Schiler(Pearson Education)
02. J2ME : The Complete Reference
By Keogh (Data McGraw-Hill)
03. Beginning J2ME from Novece to Professional
By Singli Jonathan (Wile India)

Reference Books:

01. Wireless Communications & Network By Stallings (Pearson Education)
02. Wireless and Mobile All-IP Networks By Lin & Pang(Wiley India)
03. Core J2ME Technology and MIDP Muchow (Pearson Education Asia - Sun)
04. Beginning Mobile Phone Game Programming Morrison (Pearson Education)

IT
HS 1704 PERSONNEL MANAGEMENT &
INDUSTRIAL RELATION

L-T-P: 3-0-0

Credit: 3

Introduction: Concept, Function and Importance, Role and Status of Personnel Manager, Organization of personnel Department, Personnel policies.

(5 Lectures)

Procurement of Personnel: Assessing Human Resource Requirement, Job analysis, Job description & specification, Uses of Job analysis information Recruitment-Meaning, Source of recruitment; Selection-Meaning, Objective, Method of Selection, Placement & Induction

(7 Lectures)

Training & Development: Training-Meaning, Need for Training, Method of Training; Development-Concept, The Development method

(6 Lectures)

Performance Appraisal & Job change: The Concept, Objective and the method of Performance appraisal, Job change-Transfer, Promotion and Separation

(6 Lectures)

5. Compensation-Concept, Type, Method of compensation

(6 Lectures)

6. Maintenance: Health, Safety, & Welfare, Concept of social security

(6 Lectures)

7. Industrial Relation & Trade Union

(6 Lectures)

Text Books:

1. Personnel Management- C. B. Memoria & G. V. Gankar – Himalaya

2. Personnel Management & Industrial Relation – P. C. Tripathi – Schand

3. Reference Book:

1. Industrial Relation, Trade Union & Labour Relation – G.P.Sinha & PRN Sinha- Pearson

IT
CS- 1722 Distributed Database(Elective - 1)

L-T-P: 3-0-0

Credits: 3

Introduction: Distributed Database System, Promises
Complicating Factors, Problem Areas.

Lecture: 3

Distributed Database Architecture: DBMS
Standardization, Architectural Models, Distributed DBMS
Architecture.

Lecture: 6

Distributed Database Design: Alternate Design Strategies,
Distributed Design Issues, Fragmentation, Allocation.

Lecture: 6

Semantic Data Control: View Management, Data Security,
Semantic Integrity Control

Query: Overview of Query Procession, Query
Decomposition and data Localization, Optimization of
Distributed Queries.

Lecture: 10

Introduction to Transaction Management: Properties, types
of Transaction

Lecture: 3

Distributed DBMS Reliability: Reliability Concepts and Measures, Failures and Fault Tolerance in Distributed Systems, Failures in Distributed DBMS.

Lecture:6

Parallel Database Systems: Database Serves, Parallel Architectures, Parallel DBMS Techniques, Parallel Execution Problems.

Lectures:6

Text Book:

1. Principles of Distributed Database Systems by Ozsu, Valduriez and Sridhar, Pearson.

Reference Book:

1. Data System Concepts, Silberschatz Korth Sudarshan, McGraw Gill.

IT

**CS-1704 Object Oriented Analysis and
Design(Ele-2)**

L-T-P: 3-0-0

Credits: 3

Introduction : Object Oriented Development & themes,
Usefulness of OOPS, Object Modeling Technique.

Lecture: 6

Object Technique: Link Association, Generalization,
Inheritance, Aggregation, Abstract Classes Dynamic
Modeling event & States, State Diagram, Nested State
Diagram, Relation of Object & Dynamic Model, Functional
Modeling, Data Flow Diagram, SSD, Use- Case.

Lecture: 15

Design Methodology: OMT Methodology , Analysis,
Iteration the Analysis, System Design Object Design,
Comparison of Methodologies.

Lecture: 15

Case Studies: Object oriented Language, Relational Database

Lecture: 8

Text Books:

1. Object Oriented Modeling and Design by Rumbaugh, Pearson Education.
2. Object Oriented analysis and Design: Understanding System Development with UML by Mike O Docherty, Wiley India.
3. Object Oriented analysis and Design by Kahate. Tata McGraw Hill.

Reference Books:

1. Object Oriented analysis and Design With Applications by Grady Booch, Pearsin Education.

Project I

IT-1782

Project - I

(82)

IT-1823

XML web services

L-T-P: 3-0-3

Credits:-5

XML: Introduction to XML, DTD, CSS, Namespace, Schema, XSD, XSL. **(Lectures 6)**

Introduction to Web Services: The Web Services, Data Types Mappings **(Lectures 5)**

SOAP: Communication on the web **(Lectures 4)**

WSDL: Describing Web Services **(Lectures 4)**

SOAP Tools: SOAP Toolkit, Components and architecture, exposing and invoke Web Services. **(Lectures 5)**

Developing Web Services : Using ASP, Net application using C# Programming environment. **(Lectures 5)**

Web Services: Working with WSD, and invoking them using.NET client/Java Client through the code. **(Lectures 6)**

SOAP Header: Managing the risks of Web Service, Interface-Based Web Service **(Lectures 6)**

Development of Interface-based Programming: WSDL bindings, Reusable Web Services Infrastructure
(Lectures 6)

UDDI: A Web Service, Framework & sample application
(Lectures 4)

SOAP Toolkit interoperability **(Lectures 3)**

Text Books:

1. XML 1.1 Bible, Edition by Elliotte Rusty Harold
(Wiley)
2. XML Web Services & Data Revolution by Coyle
(Pearson Education Asia)

Reference Books:

1. Beginning XML by David Hunter, Andrew Watt (Wrox Publication)
2. Professional ASP.NET 2.0 by Thiru Thangarathinam (Wrox Publication)

IT
IT-1824 Multimedia Technology & Application

L-T-P: 3-0-0

Credits:-3

Introduction : Multimedia today, Impact of Multimedia, Multimedia Systems, Components and Its Applications

(Lectures 4)

Text and Audio: Text: Types of Text, Ways to Present Text, Aspects of Text Design, Character, Charaacter Set, Codes, Unicode, Encryption; Audio: Basic Sound Computer Representation of Sound (Sampling Rate, Sampling Size, Quantization), Audio Formats, Audio tools, MIDI

(Lectures 6)

Image and Video: Image: Formats, Image Color Scheme, Image Enhancement; Video: Analogue and Digital Video, Recording Formats and Standards (JPEG, MPEG, H.261) Transmission of Video Signals, Video Capture, and Computer based Animation.

(Lectures 6)

Synchronization: Temporal relationships, synchronization accuracy specification factors, quality of service

(Lectures 3)

Storage models and Access Techniques: Magnetic media, optical media, file systems (..ditional, Multimedia) Multimedia devices – Output devices, CD-Rom, DVD, Scanner, CCD

(Lectures 5)

Image and Video Database: Image representation, segmentation, similarity based retrieval, image retrieval by color, shape and texture; indexing-k-d trees, R-trees, quad trees; Case studies- QBIC, Virage. Video Content, querying, video segmentation, indexing

(Lectures 6)

Document Architecture and Content Management: Content Design and Development, General Design Principles

Hypertext: Concept, Open Document Architecture (ODA), Multimedia and Hypermedia Coding Expert Group (MHEG), Standard Generalized Markup Language (SGML), Document Type Definition (DTD), Hypertext Markup Language (HTML) in Web Publishing. Case study of Applications

(Lectures 6)

Multimedia Application: Interactive television, Video-on-demand, Video Conferencing, Educational Applications, Industrial Application, Multimedia archives and digital libraries, media editors.

(Lectures 5)

Text Books:

1. Multimedia: Computing, Communication & Applications by Ralf Steinmetz and Klara Nahrstedt, Pearson Ed.
2. Multimedia Systems Design by Prabhat K. Andleigh & Kiran Thakrar, PHI.
3. Principles of Multimedia by Parekh, TMH

Reference Books:

1. Multimedia Literacy by Fred Hoffstetter, McGraw Hill.
2. Multimedia Fundamentals: Vol. 1- Media Coding and Content Processing by Ralf Steinmetz and Klara Nahrstedt, PHI.
3. Multimedia in Practice: Technology and Application by J. Jeffcoate, PHI.
4. Multimedia Communications by Fred Halsall, Pearson Ed.

IT-1815

IT

Intrusion Detection

L-T-P: 3-0-0

Credits:-3

Basics: Understanding Intrusion Detection, Unauthorized activity,
TCP Dump

(Lectures 8)

Architecture: IDS and IPS architecture, IDS and IPS internals

(Lectures 8)

Implementation and Deployment: Internet Security System's
Real Source, Snort, NFR Security

(Lectures 7)

Security and IDS Management: Data Correlation, Incident
Response, Policy and Procedures, Law Standards and
Organizations security Business issues, Future of Intrusion
Detection and Prevention

(Lectures 12)

Text Book:

1. Intrusion Detection & Prevention by Carl Endorf,
Eugene Schultz. And Jim Millander, TMH

Reference Book

1. Implementing Intrusion Detection Systems by Tim
Crothers, Wiley

IT-1867 E-Commerce and ERP(Elective 3)

L-T-P: 3-0-0

Credits:-3

Electronic Commerce: Overview, Definitions, Advantages & Disadvantages of E-Commerce, Indian Readiness for E-commerce, E-transition Challenges for Indian Corporate, The Information Technology Act 2000

(Lectures 6)

Business Models of E-commerce: Model Based on Transaction Party – B2C, B2B, C2C, C2B, Model Based O

(Lectures 4)

E – Marketing: Identifying Web Presence Goals, The Browsing Behaviour Model, Online Marketing, E- Advertising, Internet Marketing Trends, E-Branding, Marketing Strategies

(Lectures 5)

E - Security : Security on the Internet, E - Business Risk Management Issues, Firewall

(Lectures 4)

E- Payment Systems: Digital Payment requirements, Digital Token Based E-Payment Systems E-Cash, Risk, Designing E-Payment Systems, Digital Signature, Online Financial Services in India

(Lectures 6)

E- Supply Chain Management: Overview, Benefits, Components, Architecture, Major trends

(Lectures 3)

E- Strategy : The Virtual Value Chain, Seven Dimensions, Planning the E-Commerce Project, Knowledge Management

(Lectures 3)

Mobile Commerce: Growth, Wireless Applications, Origins, Wireless Technologies, Generations, Security issues, Indian context.

(Lectures 5)

ERP : Concept, Origin, Evolution & Structure, Best Practices, ERP Vendor Analysis Basic Functional Modules in ERP

(Lectures 5)

Text Books:

1. E- Commerce An Indian Perspective by P.T. Joseph, PHI
2. Enterprise Resource Planning Theory & Practice By Rahul V. Altekar, PHI

Reference Books:

1. Introduction to E- Commerce by Rayport & Jaworski , TMH
2. Frontiers of Electronic Commerce by Kalakota & Whinston, Pearson Education
3. E- Commerce: Strategy Technologies & Applications by David Whiteley, TMH

IT
IT-1874 Management Information System (Elective 4)

L-T-P: 3-0-0

Credits: 3

Strategic Views of Management Information System:

Introduction to MIS: Concept, Definition, Role, Impact etc, E-business Enterprise: Introduction, E-business, E-commerce, E-communication, E-collaboration **(Lectures 6)**

Strategic Management of Business: Corporate Planning, Strategic Planning, Development of Business Strategies, Types of Strategies, Short-Range Planning, MIS: Business Planning, Information Security Challenges in E-enterprises

(Lectures 7)

Basics of Management Information System:

Decision Making: Concepts, Process, Behavioral concepts, Organizational Decision Making, MIS and Decision Making Concepts

Information: Concepts, Classification, Methods of Collection, Value, Knowledge **(Lectures 6)**

System Analysis & Design: Concepts, Control, Types, Handling Complexity, Classes, General Model, Structured System Analysis & Design, Computer System Design, MIS and System Analysis

(Lectures 6)

Development of MIS: Long Range Plans, Class of Information, Information Requirement, Implementation of MIS, Quality in the MIS, Organization for development of the MIS. MIS: Development Process Model (Lectures 6)

Business Process Re-Engineering: Business Process, Process Model, Value Stream Model, Relevance of IT, MIS and BPR (Lectures 4)

Application of Management Information System to E-Business:

Application of MIS: Application in Manufacturing Sector, Applications in Service Sector, Decision Support Systems, Enterprise Management Systems. (Lectures 5)

Case Studies: Tata Home Finance Ltd and Engineering Product Limited. (Lectures 4)

Text Book:

1. Management Information Systems by W S Jawadekar TMH,

Reference Books

1. Management Information Systems, Managing the digital firm by Laudon Pearson
2. Management Information by S Sadagopan. PHI