SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
CH, CS, EI, IT, ME Branches
With Effective from 2014-2015 Academic Year
First Year B.Tech., (SEMESTER – I)

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14MA101	Engineering Mathematics – I	4	1	0	0	5	40	60	100	4
14PH102	Engineering Physics – I	4	0	0	0	4	40	60	100	3
14CY103	Engineering Chemistry – I	4	0	0	0	4	40	60	100	3
14EE104	Basic Electrical and Electronics Engineering	4	0	0	0	4	40	60	100	3
14ES105	Environmental Studies	4	0	0	0	4	40	60	100	3
14EG106	Engineering Graphics	4	1	0	1	6	40	60	100	4
14CYL101	Chemistry Lab	0	0	3	0	3	40	60	100	2
14HWL102	Hardware Lab	0	0	3	0	3	40	60	100	2
14WSL103	Workshop	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

CH, CS, EI, IT, ME Branches

With Effective from 2014-2015 Academic Year

First Year B.Tech., (SEMESTER – II)

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14MA201	Engineering Mathematics – II	4	1	0	0	5	40	60	100	4
14PH202	Engineering Physics – II	4	0	0	0	4	40	60	100	3
14CY203	Engineering Chemistry – II	4	0	0	0	4	40	60	100	3
14EL204	Communicative English	4	0	0	0	4	40	60	100	3
14EM205	Engineering Mechanics	4	1	0	0	5	40	60	100	4
14CP206	Problem Solving with Programming	4	0	0	1	5	40	60	100	3
14PHL201	Physics lab	0	0	3	0	3	40	60	100	2
14ELL202	English Communication Skills Lab	0	0	3	0	3	40	60	100	2
14CPL203	Problem Solving with Programming Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	360	540	900	26

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Second Year B.Tech., (SEMESTER – III)

For

CSE Branch

With Effect From 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14MA301	Engineering Mathematics – III	4	0	0	0	4	40	60	100	3
14CS302	Discrete Mathematical Structures	4	1	0	0	5	40	60	100	4
14CS303	Digital Logic Design	4	0	0	0	4	40	60	100	3
14CS304	Operating System	4	0	0	1	5	40	60	100	3
14CS305	Data Structures	4	1	0	0	5	40	60	100	4
14CS306	Object Oriented Programming	4	0	0	0	4	40	60	100	3
14ELL301	Soft Skills Lab	0	0	3	0	3	40	60	100	2
14CSL302	Data Structures Lab	0	0	3	0	3	40	60	100	2
14CSL303	OOPS Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Second Year B.Tech., (SEMESTER – IV)

For

CSE Branch

With Effect From 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14MA401	Engineering Mathematics - IV	4	0	0	0	4	40	60	100	3
14CS402	Professional Ethics and Human Values	4	0	0	0	4	40	60	100	3
14CS403	Computer Organization	4	1	0	0	5	40	60	100	4
14CS404	Design and Analysis of Algorithms	4	1	0	0	5	40	60	100	4
14CS405	GUI Programming	4	0	0	1	5	40	60	100	3
14CS406	Web Technologies	4	0	0	0	4	40	60	100	3
14CSL401	DAA Lab	0	0	3	0	3	40	60	100	2
14CSL402	GUI Programming Lab	0	0	3	0	3	40	60	100	2
14CSL403	Web Technologies Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Third Year B.Tech., (SEMESTER – V)

For

CSE Branch

With Effect From 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14CS501	Software Engineering	4	0	0	0	4	40	60	100	3
14CS502	Automata Theory & Formal Languages	4	0	0	0	4	40	60	100	3
14CS503	Microprocessors & Microcontrollers	4	0	0	1	5	40	60	100	3
14CS504	Database Management Systems	4	1	0	0	5	40	60	100	4
14CS505	Enterprise Programming-I	4	1	0	0	5	40	60	100	4
14CS506	Elective – I	4	0	0	0	4	40	60	100	3
14CSL501	MPMC Lab	0	0	3	0	3	40	60	100	2
14CSL502	RDBMS Lab	0	0	3	0	3	40	60	100	2
14CSL503	Enterprise Programming-I Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

Elective I

14CS506/A	Artificial Intelligence
14CS506/B	Principles of Programming Languages
14CS506/C	Machine Learning
14CS506/D	Graph Theory

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Third Year B.Tech., (SEMESTER – VI)

For

CSE Branch

With Effect From 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14CS601	Introduction to Data Analytics	4	0	0	0	4	40	60	100	3
14CS602	Compiler Design	4	0	0	0	4	40	60	100	3
14CS603	Computer Networks	4	1	0	0	5	40	60	100	4
14CS604	Enterprise Programming-II	4	1	0	0	5	40	60	100	4
14CS605	Cloud and Mobile Application Development	4	0	0	1	5	40	60	100	3
14CS606	Elective - II	4	0	0	0	4	40	60	100	3
14CSL601	Introduction to Data Analytics Lab	0	0	3	0	3	40	60	100	2
14CSL602	Enterprise Programming-II Lab	0	0	3	0	3	40	60	100	2
14CSL603	Cloud and Mobile Application Development Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	**360**	**540**	**900**	**26**

Elective II

14CS606/A	Natural Language Processing
14CS606/B	Parallel Processing
14CS606/C	Digital Image Processing
14CS606/D	Advanced Computer Architecture

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture T: Tutorial P: Practical S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Final Year B.Tech., (SEMESTER – VII)

For

CSE Branch

With Effect From 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14CS701	Introduction to Cyber Security	4	0	0	0	4	40	60	100	3
14CS702	Object Oriented Analysis and Design	4	0	0	0	4	40	60	100	3
14CS703	Advanced Data Analytics	4	1	0	0	5	40	60	100	4
14CS704	Wireless Networks	4	1	0	0	5	40	60	100	4
14CS705	Elective-III	4	0	0	0	4	40	60	100	3
14OE706	Open Elective	4	0	0	0	4	40	60	100	3
14ELL701	Business Communication and Presentation Skills Lab	0	0	2	0	2	20	30	50	1
14CSL702	Introduction to Cyber Security Lab	0	0	3	0	3	40	60	100	2
14CSL703	Advanced Data Analytics Lab	0	0	3	0	3	40	60	100	2
14CSL704	Term Paper	0	0	2	0	2	20	30	50	1
	TOTAL	24	2	10	0	36	**360**	**540**	**900**	**26**

Elective III

14CS705/A	Software Project Management
14CS705/B	Distributed Systems
14CS705/C	E Commerce
14CS705/D	Software Quality Management

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Final Year B.Tech., (SEMESTER – VIII)

For

CSE Branch

With Effect From 2014-2015 Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total Marks	
14ME801	Industrial Management & Enterpreneurship Development	4	0	0	0	4	40	60	100	3
14CS802	Advanced Cyber Security	4	1	0	0	5	40	60	100	4
14CS803	Elective - IV	4	0	0	1	5	40	60	100	3
14CS804	Elective - V	4	0	0	0	4	40	60	100	3
14CSPR801	Project Work	0	0	12	0	12	50	100	150	10
14CSL801	Advanced Cyber Security Lab	0	0	3	0	3	40	60	100	2
	TOTAL	16	1	15	1	33	**250**	**400**	**650**	**25**

Elective IV		Elective IV	
14CS803/A	Software Testing Methodologies	14CS804/A	Real Time Systems
14CS803/B	Web Mining	14CS804/B	Network Management Systems
14CS803/C	ADBMS	14CS804/C	High speed Networks
14CS803/D	Bioinformatics	14CS804/D	Adhoc Sensor Networks

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical S: Self Study

Engineering Mathematics – I
(Common for all branches)
I B.Tech – I Semester (Code: 14MA101)

Lectures	4	Tutorial	1	Practical	0	Self Study	0
Continuous Internal Assessment	:	40	Semester End Examination (3 Hours)	:	60		

UNIT - I

Matrix Algebra: Rank of a Matrix, Linear Independence, Vector Space, Solutions of Linear Systems, Inverse of a Matrix by Gauss-Jordan Elimination, Vector Spaces, Inner Product Spaces, Linear Transformations. Eigen Values, Eigen Vectors, Some applications of Eigen value problems. Symmetric, Skew-Symmetric and Orthogonal Matrices.

UNIT II

Matrix Algebra: Complex Matrices: Hermitian, Skew-Hermitian and Unitary, Similarity of Matrices, Basis of Eigen Vectors, Diagonalization.

Differential Calculus: Rolle's Theorem, Lagrange's Mean Value Theorem and Taylor's Theorem (without Proofs), Taylor's and, Maclaurin's Series for functions of one variable. Maxima and Minima of functions of Two Variables, Lagrange's method of Multipliers.

UNIT III

Fourier Series: Periodic Functions, Trigonometric Series, Fourier Series, Functions of Any Period P = 2L, Even and Odd Functions, Half Range Expansions, Complex Fourier Series.

UNIT IV

Integral Calculus: Evaluation of double integrals (Cartesian & Polar), Changing the order of integration, Evaluation of triple integrals, Applications of triple integrals to find area and volume.

TEXT BOOK:

1. Erwin Kreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.

REFERENCE BOOKS:

1. "Advanced Engineering Mathematics", Peter V. O'Neil, Thomsons Brooks/Cole.
2. "Advanced Calculus", Murray R Spiegel, Schaum's outline series.

Engineering Physics – I

(Common for all branches)

I B.Tech – I Semester (Code: 14PH102)

Lectures	4	Tutorial	0	Practical	0	Self Study	0
Continuous Internal Assessment	:	40	Semester End Examination (3 Hours)	:	60		

UNIT – I

OPTICS:

INTERFERENCE: Coherence, spatial and temporal coherences, interference due to thin films(reflected system), cosine law, anti-reflection coating, Michelson interferometer and its applications, (determination of wavelengths of monochromatic light and resolution of two nearby wavelengths)., Newton's rings theory and applications(determination of wavelength of light, and refractive index of transparent liquid).

DIFFRACTION: Fresnel &Fraunhoffer diffraction, Fraunhoffer diffraction due to single slit, plane diffraction grating, dispersive and resolving powers of a grating.

POLARISATION: Introduction, double refraction,Nicol prism, quarter wave plate, half wave plate, production and detection of circularly and elliptically polarised lights and optical activity, Electro optic effect(Kerr effect),Magneto optic effect(Faraday effect).

UNIT II

LASERS & FIBER OPTICS:

LASERS: Properties of lasers**,** Spontaneous and stimulated emissions, Population inversion, Solid state (Ruby) laser, Gas(He-Ne) laser, semiconductor (Ga-As) laser, Applications.

HOLOGRAPHY: Principle, recording and reproduction of holography, Applications.

FIBER OPTICS: Structure and types of optical fibers, acceptance angle, Numerical aperture, losses in optical fibers, fiber optic communication and its advantages.

UNIT III

ELECTRICITY & MAGNETISM:

Gauss's law in static electricity (qualitative only), Gauss's law of magnetism, circulating charges, Cyclotron-construction, working and limitations, Hall effect and its applications, displacement current, Maxwell's equations (qualitative treatment), E M oscillations, velocity of EM waves, energy transport and the pointing vector, AC circuit containing series LCR circuit-resonance condition and quality factor.

UNIT IV

MODERN PHYSICS:

Dual nature of light, de-Broglie's concept of matter waves, Davisson-Germer electron diffraction experiment, Heisenberg's uncertainty principle and applications (non-existence of electron in a nucleus and finite width of spectral lines), one dimensional time-independent and dependent Schrödinger wave equations, physical significance of wave function, applications of time-independent Schrödinger wave equation to particle in a box(one dimensional), tunneling, the scanning tunneling microscope.

TEXT BOOK:

1. "A Text Book of Engineering Physics", M.N. Avadhanulu, P.G. Kshirasagar, S.Chand& Co.,(Edition – 2013).

REFERENCE BOOKS:

2. "Engineering physics"by R.K.Gour and S.L.Gupta. Dhanpatrai publications.
3. "Basic Engineering Physics" by P.Srinivasarao&K.Muralidhar,Himalaya publications.
4. "Engineering physics" by M.R.Sreenivasan. New age international publications
5. "Engineering physics" by Palaniswamy. Scitech publications

Engineering Chemistry – I
(Common for all branches)
I B.Tech – I Semester (Code: 14CY103)

Lectures	4	Tutorial	0	Practical	0	Self Study	0
Continuous Internal Assessment	:	40	Semester End Examination (3 Hours)	:	60		

UNIT I: Water Technology: (Industrial Purpose) **13 periods**

Characteristics: **Alkalinity** – types of alkalinity and determination (Including simple problems); **Hardness** – types, units and estimation by EDTA method (Including simple problems)

Boiler feed water - Scales, Sludges, Caustic embrittlement, boiler corrosion, Priming and foaming;

Internal conditioning - phosphate, calgon and carbonate methods
External conditioning - Ion exchange process, Lime Soda process (Including simple problems)

UNIT II: **12 periods**

Domestic water treatment – WHO Guidelines, Potable water, Sedimentation, Coagulation, Filtration (Slow sand filter) and disinfection methods: Chlorination - break point chlorination, ozonization, UV treatment.
Desalination: Electro Dialysis and Reverse Osmosis.

Phase rule
Statement and explanation of terms involved; One component system – water system; Condensed phase rule, Thermal analysis - Thermal behavior of pure and impure solids, Eutectic system, Eutectic mixture & Eutectic point, Construction of phase diagram for Bi-Cd system by thermal analysis, Simple eutectic systems (lead-silver system only).

UNIT III: Energy Sources (Fuels) **13 eriods**

Classification of fuels; Calorific value of fuels (lower, higher)

Solid fuels: determination of calorific value (Bomb Calorimeter), Coal ranking, Carbonization of coal (Otto-Hoffman by-product method); Proximate and ultimate analysis of coal.

Petroleum based: Petroleum processing and fractions; Cracking – catalytic cracking method (fixed bed); Synthetic petrol: Bergius process, Knocking and anti- knocking Agents, Octane number and Cetane number;
Gaseous fuels: CNG and LPG,

UNIT IV: Engineering Materials **12 Periods**

Refractories: Classification – Acidic, Basic and Neutral refractories; Properties: refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling; Preparation, Properties and applications of alumina, magnesite and zirconia bricks,

Composites: Introduction Constituents of Composites, types- Fibre reinforced Particulate and Layered composites and their applications.

Lubricants: Mechanism of lubrication, Liquid lubricants - properties: viscosity index, flash and fire points, cloud and pour points, oiliness; Solid lubricants - graphite and molybdenum sulphide.

TOTAL: 50 PERIODS

TEXT BOOKS:

1. P.C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi 15th edition (2010).

REFERENCES:

1 Essential Of Physical Chemistry by ArunBahl, B.S. Bahl, G.D.Tuli, by ArunBahl, B.S. Bahl, G.D.Tuli, Published by S Chand Publishers

2 Text Book of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad (2006).

3 Engineering Chemistry by K. Maheswaramma, Pearson publishers 2015.

Basic Electrical and Electronics Engineering
(Common for all branches)
I B.Tech – I Semester (Code: 14EE104 / 14EE204)

Lectures	4	Tutorial	0	Practical	0	Self Study	0
Continuous Internal Assessment	: 40			Semester End Examination (3 Hours)		:	60

UNIT – I

Basic Concepts of Electric Circuits: Introduction, Electric Current, Ohm's Law, Work, Power, and Energy, Dynamically Induced EMF and Statically Induced EMF, Self-induced EMF and Mutually Induced EMF, Self-inductance of a Coil, Mutual Inductance, Energy Stored in a Magnetic Field, Electrical Circuit Elements, Energy Stored in a Capacitor, Capacitor in Parallel and in Series.

DC Networks and Network Theorems: DC Network Terminologies, Voltage and Current Sources, Series Parallel Circuits, Voltage and Current Divider Rules, Kirchhoff's Laws, Maxwell's Mesh Current Method, Nodal Voltage Method (Nodal Analysis), Network Theorems (Superposition Theorem, Thevenin's Theorem, Norton's Theorem).

UNIT – II

AC Fundamentals: Introduction, Generation of Alternating Voltage in an Elementary Generator, Concept of Frequency, Cycle, Time Period, Instantaneous Value, Average Value, and Maximum Value, Sinusoidal and Non-sinusoidal Wave Forms, Concept of Average Value and Root Mean Square (RMS) Value of an Alternating Quantity, Analytical Method of Calculation of RMS Value, Average Value, and Form Factor, RMS and Average Values of Half-wave rectified Alternating Quantity, Concept of Phase and Phase Difference.

Transformers: Introduction, Basic Principle and Constructional Details, EMF Equation.

UNIT – III

Semiconductor Devices: Introduction, Review of Atomic Theory, Binding Forces Between Atoms in Semiconductor Materials, Extrinsic Semiconductors, Semiconductor Diodes; Volt-ampere Characteristic of a Diode, An Ideal Diode, Diode Parameters and Diode Ratings, Zener Diode; Zener Diode As Voltage Regulator, Zener Diode As a Reference Voltage, Bipolar Junction Transistors; Working of a n-p-n Transistor, Working of a p-n-p Transistor, Transistor Configurations, Transistor As an Amplifier, Transistor As a Switch, Rectifiers and Other Diode Circuits.

Rectifiers: Introduction, Half-Wave, Full wave Rectifiers and their analysis, Comparison of Half-Wave and Full-Wave Rectifiers.

UNIT – IV

Digital Electronics: Introduction, Number System, Octal Number System, Hexadecimal Number System, Application of Binary Numbers in Computers, Logic Gates, Boolean

Algebra, De Morgan's Theorem, Combinational Circuits, Simplification of Boolean Expressions Using De Morgan's Theorem.
Integrated Circuits: Introduction, Fabrication of Monolithic ICs, Hybrid Integrated Circuits, Linear and Digital ICs.

TEXT BOOK: "Basic Electrical and Electronics Engineering", S.K. Bhattacharya, Pearson Publications

REFERENCE BOOKS:

1. "Basic Electrical, Electronics and Computer Engineering", Muthusubramanian R, Salivahanan S and Muraleedharan K A, Tata McGraw Hill, Second Edition, (2006).

2. "Basics of Electrical and Electronics Engineering", Nagsarkar T K and Sukhija M S, Oxford press University Press.

Engineering Mechanics
(Common for all branches)
I B.Tech – I Semester (Code: 14EM105 / 14EM205)

Lectures	4	Tutorial	1	Practical	0	Self Study	0
Continuous Internal Assessment	:	40		Semester End Examination (3 Hours)		:	60

UNIT – I

Concurrent Forces in a Plane

Principles of statics – Composition and resolution of forces – Equilibrium of concurrent forces in a plane –Method of moments.

Parallel Forces in a Plane

Two parallel forces – General case of parallel forces in a plane – Center of parallel forces – Centroids of composite plane figures and curves

UNIT – II

Moments of Inertia of Plane Figures

Moment of inertia of a plane figure with respect to an axis in its plane – Moment of Inertia with respect to an axis perpendicular to the plane of the figure – Parallel axis theorem

General Case of Forces in a Plane

Composition of forces in a plane – Equilibrium of forces in a plane – Plane trusses: method of joints.

UNIT – III

Friction

Characteristics of friction – problems involving dry friction

Rectilinear Translation

Kinematics of rectilinear motion – principles of dynamics – Differential equations of rectilinear motion D'Alemberts principle – momentum and impulse – work and energy – ideal systems: conservation of energy

UNIT – IV

Curvilinear Translation

Kinematics of curvilinear motion – Differential equations of curvilinear motion – D'Alembert's principle – Work and Energy.

Moments of Inertia of Material Bodies

Moment of inertia of a rigid body – Moment of inertia of a lamina – Moments of inertia of three – dimensional bodies.

Rotation of a Rigid Body about a Fixed Axis

Kinematics of rotation – Equation of motion for a rigid body rotating about a fixed axis – D'Alembert's principle

NOTE

Two questions of 12 marks each will be given from each unit out of which one is to be answered. Twelve questions of one mark each will be given from entire syllabus which is a compulsory question.

TEXT BOOK

1. Engineering mechanics by S. Timoshenko and D. H. Young – McGraw-Hill International edition (For concepts and symbolic problems)
2. Engineering mechanics statics and dynamics by A. K. Tayal – Umesh publication, Delhi (For numerical problems using S.I. system of units

REFERENCE BOOKS

1. Vector mechanics for engineers statics and dynamics by Beer and Johnston, Tata McGraw-Hill publishing company, New Delhi
2. Engineering mechanics statics and dynamics by R. C. Hibbeler and Ashok Gupta - Pearson (For numerical problems using S.I. system of units)

Problem Solving with Programming
(Common for all branches)
I B.Tech – ISemester (Code: 14CP106 / 14CP206)

Lectures	4	Tutorial	0		Practical	0	Self Study	1	
Continuous Internal Assessment			:	40	Semester End Examination (3 Hours)			:	60

UNIT – I

Basics and Introduction to C, The C Declarations, Operators and Expressions,Input and Output in C,Decision Statements, Programming Exercises for Unit I:C-expressions for algebraic expressions, evaluation of arithmetic and Boolean expressions. Syntactic errors in a given program, output of a given program, values of variables at the end of execution of a program fragment, filling the blanks in a given program. Programs using Scientific and Engineering formulae. Finding the largest of the three given numbers. Computation of discount amount on different types of products with different discount percentages. Finding the class of an input character, finding the type of triangle formed with the given sides, computation of income-tax, computation of electricity bill and conversion of lower case character to its upper case.

UNIT – II

Loop Control, Data Structure: Array, Programming Exercises for Unit – II**:** To print the sum of the digits of a given number and to display the image of a given number. To find whether a given number is prime, printing Fibonacci sequence and to find prime factors of a given number. To print graphic patterns of symbols and numbers and computation of statistical parameters of a given list of numbers. To find the length of a string, compare strings, reverse a string, copy a string and to find whether the given string is palindrome or not. Transpose of a matrix, product and sum of matrices and sorting of names using arrays.

UNIT – III

Strings and Standard Functions,Pointers,Dynamic Memory Allocation and Linked List:Dynamic Memory Allocation, Memory Models, Memory Allocation Functions.
Functions, Storage Class,Programming Exercises for Unit - III**:** Functions - Insertion sort, Linear search. Recursive functions to find factorial & GCD (Greatest Common Divisor), string operations using pointers and pointer arithmetic and dynamic memory allocation. Swapping two variable values. Sorting a list of names using array of pointers.

UNIT – IV

Preprocessor Directives:Introduction, The #define Directive, Undefining a Macro, Token Pasting and Stringizing Operators, The #include Directive, Conditional Compilation, The #ifndef Directive.
Structure and Union, Files,Programming Exercises for Unit - IV:Operations on complex numbers, matrix operations with the matrix and the size of the matrix as a structure, sorting a list of student records on register number using array of pointers and to read an input file of marks and generate a result file, sorting a list of names using command line arguments.

TEXT BOOK:

1. Ashok N.Kamthane, "Programming in C", PEARSON 2nd Edition.

REFERENCE BOOKS:

1. Kernighan BW and Dennis Ritchie M, "C programming language", 2nded, Prentice Hall.
2. Yashavant P. Kanetkar, "Let us C", BPB Publications.
3. E.Balagurusamy, "Programming in ANSI C", 4thed, Tata Mcgraw-Hill.
4. Herbert Schildt, "C: The Complete Reference", 4th edition, Tata Mcgraw-Hill.

Physics Laboratory
(Common for all branches)
I B.Tech – I Semester (Code: 14PHL101 / 14PHL201)

Lectures	0	Tutorial	0	Practical	3	Self Study	0
Continuous Internal Assessment	: 40			Semester End Examination (3 Hours)		:	60

LIST OF EXPERIMENTS

1. Determination of acceleration due to gravity at a place using compound pendulum.
2. Study the variation of intensity of magnetic field along the axis of a circular coil using Stewart-Gee's apparatus.
3. Determination of thickness of thin wire using air wedge interference bands.
4. Determination of radius of curvature of a Plano convex lens by forming Newton's rings.
5. Determination of wavelengths of mercury spectrum using grating normal incidence method.
6. Determination of dispersive power of a given material of prism using prism minimum deviation method.
7. Draw the resonant characteristic curves of L.C.R. series circuit and calculate the resonant frequency.
8. Draw the characteristic curves of a photocell and calculate the maximum velocity of electron.
9. Verify the laws of transverse vibration of stretched string using sonometer.
10. Determine the rigidity modulus of the given material of the wire using Torsional pendulum.
11. Draw the load characteristic curves of a solar cell.
12. Determination of Hall coefficient of a semiconductor.
13. Determination of voltage and frequency of an A.C. signal using C.R.O.
14. Determination of Forbidden energy gap of Si &Ge.
15. Determination of wavelength of laser source using Diode laser.

TEXT BOOK:

1. "Engineering physics laboratory manual"P.Srinivasarao&K.Muralidhar,Himalaya publications.

Hardware Laboratory
(Common for all branches)
I B.Tech – I Semester (Code: 14HWL102 / 14HWL202)

Lectures	0	Tutorial	0	Practical	3	Self Study	0
Continuous Internal Assessment	:	40		Semester End Examination (3 Hours)	:	60	

LIST OF EXPERIMENTS

1. Identification and testing of various electronic components. (Resistors, Inductor, Capacitor, Transistor, ICs and Bread board)
2. Study of Oscilloscope, Function generator, Power supply and Multi meter.
3. KCL & KVL verification for simple circuits on Bread board.
4. Study of Ceiling fan.
5. Study of Florescent lamp.
6. Study of Single Phase Transformer.
7. Identifying all parts of computers.
8. Install and Uninstall system and application software.
9. Assembling a Computer.
10. Connecting computers in a network.

Problem Solving with Programming Laboratory
(Common for all branches)
I B.Tech – I Semester (Code: 14CPL103 / 14CPL203)

Lectures	0	Tutorial	0	Practical	3	Self Study	0
Continuous Internal Assessment	:	40	Semester End Examination (3 Hours)	:	60		

LIST OF EXPERIMENTS

1. A program for electricity bill taking different categories of users, different slabs in each category. (Using nested if else statement).

Domestic Customer:		
Consumption Units	**Rate of Charges(Rs.)**	
0 – 200	0.50 per unit	
201 – 400	100 plus	0.65 per unit
401 – 600	230 plus	0.80 per unit
601 and above	390 plus	1.00 per unit
Commercial Customer:		
Consumption Units	**Rate of Charges(Rs.)**	
0 – 50	0.50 per unit	
100 – 200	50 plus	0.6 per unit
201 – 300	100 plus	0.70 per unit
301 and above	200 plus	1.00 per unit

2. Write a C program to evaluate the following (using loops):
   a) $1 + x^2/2! + x^4 / 4!+ \ldots$upto ten terms
   b) $x + x^3/3! + x^5/5!+ \ldots$ upto 7 digit accuracy
3. Write a C program to check whether the given number is
   a) Prime or not.
   b) Perfect or Abundant or Deficient.
4. Write a C program to display statistical parameters (using one – dimensional array).
   a) Mean
   b) Mode
   c) Median
   d) Variance.
5. Write a C program to read a list of numbers and perform the following operations
   a) Print the list.
   b) Delete duplicates from the list.
   c) Reverse the list.
6. Write a C program to read a list of numbers and search for a given number using Binary search algorithm and if found display its index otherwise display the message "Element not found in the List".

7. Write a C program to read two matrices and compute their sum and product.
8. A menu driven program with options (using array of character pointers).
    a) To insert a student name
    b) To delete astudent name
    c) To print the names of students
9. Write a C program to read list of student names and perform the following operations
    a) To print the list of names.
    b) To sort them in ascending order.
    c) To print the list after sorting.
10. Write a C program that consists of recursive functions to
    a) Find factorial of a given number
    b) Solve towers of Hanoi with three towers (A, B & C) and three disks initially on tower A.
11. A Bookshop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book the sales person inputs the title and the author, and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed, if it is, then the system displays the book details and request for the number of copies required ,if the requested copies are available the total cost of the requested copies is displayed otherwise the message “required copies not in stock” is displayed. Write a program for the above in structures with suitable functions.

12. Write a C program to read a data file of students’ records with fields(Regno, Name, M1,M2,M3,M4,M5) and write the successful students data (percentage > 40%) to a data file.

Engineering Mathematics – II
(Common for all branches)
I B.Tech – II Semester (Code: 14MA201)

Lectures	4	Tutorial	1	Practical	0	Self Study	0
Continuous Internal Assessment	:	40		Semester End Examination (3 Hours)		:	60

UNIT – I

First Order Differential Equations: Basic concepts, Geometrical meaning, Separable Differential Equations, Exact Differential Equations, Integrating Factors, Linear Differential Equations, Bernoulli's Equation, Orthogonal Trajectories of curves, Some Engineering Applications: Growth-Decay and Newton's Law of Cooling.

UNIT – II

Linear Differential Equations of Second Order: Homogeneous Linear Equations of Second Order, Second Order Homogeneous Equations with Constant Coefficients, Case of Complex Roots, Euler-Cauchy Equations, Non-Homogeneous Equations, Solution by Undetermined Coefficients, Solution by Variation of Parameters, Applications-Modeling of Electric Circuits.

UNIT – III

Laplace Transforms: Laplace Transform, Inverse Transform, Linearity, Shifting, Transforms of Derivatives and Integrals, Differential Equations, Unit Step Function, Second Shifting Theorem, Dirac's Delta Function, Convolution theorem (without proof).

UNIT – IV

Vector calculus: Scalar and vector point functions, Gradient of a scalar field, Directional derivative, Divergence of a vector field, curl of a vector field, Line integrals, Line integrals independent of path, Green's theorem in the plane (without proof), Surface integrals, Triple integrals, Divergence theorem of Gauss (without proof), Applications to Engineering problems, Stokes theorem(without proof).

TEXT BOOK:

1. "Advanced Engineering Mathematics", Erwin Kreyszig, 9th edition, John Wiley & Sons.

REFERENCE BOOK:

1. "Advanced Engineering Mathematics", Peter V. O'Neil, Thomsons Brooks/Cole.

Engineering Physics – II
(Common for all branches)
I B.Tech – II Semester (Code: 14PH202)

Lectures	4	Tutorial	0	Practical	0	Self Study	0
Continuous Internal Assessment	:	40		Semester End Examination (3 Hours)	:	60	

UNIT – I

Electron theory of solids & semiconductor physics:

Electron theory of solids: Failure of classical free electron theory, quantum free electron theory, Fermi-Dirac distribution and its temperature dependence, Kronig-Penny model (Qualitative), effective mass of electron, concepts of energy band gap and hole.

Semiconductor physics: Classification of semiconductors, density of states, carrier concentration in intrinsic and extrinsic semiconductors, law of mass action, conductivity in semiconductors (drift and diffusion), Equation of continuity, P-N junction diode and its V-I characteristics.

UNIT – II

Magnetic, Dielectric and Ferro-electric materials:

Origin of magnetic moment of an atom, Bohr magneton, Domain theory of Ferro magnetism, curie-weisslaw(Qualitative), Hysteresis curve, soft and hard magnetic materials, ferrites and its applications.

Dielectric materials: Types of polarizations, internal field (qualitative), Classius – Mossotti equation, Frequency dependence of polarization, Ferroelectrics and its applications, strength of dielectrics and dielectric breakdown.

UNIT – III

Advanced materials:

Nano-materials: Introduction to nano-materials, surface to volume ratio, quantum confinement, properties of nano materials, Fabrication of nano-materials(CVD and sol-gel methods) , carbon nano tubes and its properties, Applications of nano materials.

Superconductivity: Critical temperature, critical magnetic field and critical current. Meissner effect, type-I and type-II superconductors, attractive interactions, qualitative treatment of BCS theory and, Josephson's junction, Applications of superconductors.

Opto-electronic devices: Working and applications of solar cell, LED, LCD, Photo Diode.

UNIT – IV

Analytical techniques:

Nuclear techniques: Radio isotopes and its applications (Medical and Industrial), GM-counter, scintillation counter.

Ultrasonics: Properties of ultrasonics, General applications of ultrasonics.

Medical applications: Cardiology and Ultrasonic imaging.

Industral applications: NDT (Pulse echo technique) and cavitation effect. Time of flight diffraction technique.

Structure determination: Crystal lattices (Bravais), and planes, Miller indices, Bragg's law, structural analysis of crystals using X-Ray powder diffraction method.

TEXT BOOK:

1. "A Text Book of Engineering Physics", M.N.Avadhanulu& P. Krushisagar, S.Chand Publication., (Edition – 2013).

REFERENCE BOOKS:

2. "Engineering physics"by R.K.Gour and S.L.Gupta. Dhanpatrai publications.
3. "Basic Engineering Physics" by P.Srinivasarao&K.Muralidhar,Himalaya publications.
4. "Engineering physics" by M.R.Sreenivasan. New age international publications.
5. "Engineering physics" by Palaniswamy. Scitech publications.

Engineering Chemistry – II
(Common for all branches)
I B.Tech – II Semester (Code: 14CY203)

Lectures	4	Tutorial	0	Practical	0	Self Study	0
Continuous Internal Assessment	:	40		Semester End Examination (3 Hours)		:	60

UNIT I

Polymers: **12 periods**

Introduction, polymerization: types – addition and condensation polymerization; Mechanism of free radical addition polymerization with suitable example; Polymer Tacticity and Ziegler Natta polymerization (mechanism).

Plastics: Classification (Thermoplastic and thermosetting); Preparation, properties and uses of PVC, Teflon, Bakelite, Nylon-6,6.

Rubbers: Natural rubber**,** drawbacks of raw rubber**,** Vulcanization of rubber; Synthetic rubbers: Buna-S, Buna-N and Poly urethane.

UNIT II

Electro Chemistry **13 periods**

Electrode potential, Determination of single electrode potential; Nernst equation (problems); Electrochemical series – significance; Electro chemical cells, Reversible and irreversible cells, Reference electrodes – Standard Hydrogen electrode, Calomel electrode, Ion selective electrode (glass electrode) – measurement of pH;

Solar cells: Introduction, Solar Panels, Applications;
Fuel Cells: Hydrogen – Oxygen Fuel Cell;
Batteries: Lead – acid, NiCad and Lithium Batteries.

UNIT III: Corrosion and Corrosion Control **13 periods**

Corrosion: Types of corrosion - Chemical or dry corrosion, Pilling – Bedworth rule; Electrochemical or wet corrosion; Galvanic corrosion, pitting, stress and differential aeration corrosion; factors influencing corrosion;

Corrosion control – sacrificial anodic method and impressed current cathodic methods, corrosion inhibitors; Protective coatings: Metallic coatings – electro plating (Au) and electroless plating (Ni). Paints – constituents and functions,

Green Chemistry: Principles and applications of green chemistry, Integrated Waste Management (IWM), Zero Waste Technologies (ZWT), green auditing, green solvents, green catalysts, green energies.

UNIT-IV: Analytical Techniques **12 periods**

Beer-Lambert's law; **Colorimetry**: principle, instrumentation (with block diagram) and Estimation of iron, **Flame photometry**: principle, instrumentation (with block diagram) and estimation of sodium; **A**tomic **A**bsorption **S**pectroscopy: principle, instrumentation (with block diagram) and estimation of nickel.

Conductometric titrations (Acid-Base) and Potentiometric titrations (Redox titrations – Fe^{2+}*vs*dichromate).

TOTAL: 50 PERIODS

TEXT BOOKS:

1. C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi 15^{th} edition (2010).

REFERENCES:

1. S.S. Dara &Mukkanti K. "A text book of engineering chemistry" S. Chand & Co. Ltd., New Delhi (2006).

2. B. Sivasankar "Engineering Chemistry" Tata McGraw Hills co., New Delhi (2008).

3. Dr. B. K. Sharma, Instrumental methods of analysis, Krishna Prakashan Media, 2000.

Communicative English
(Common for all branches)
I B.Tech – II Semester (Code: 14EL204 / 14EL104)

Lectures	4	Tutorial	0	Practical	0	Self Study	0
Continuous Internal Assessment	:	40	Semester End Examination (3 Hours)	:	60		

UNIT-I

a. **Text: Unit-I** Going Places: Travel
   Unit-II Reaching Out: Mass Media
b. **Grammar:** Review of Parts of Speech, Concord
c. **Writing:** Mind Mapping, Paragraph Writing : Structure, Development & Types
d. **Vocabulary** from the suggested units (Given List)

UNIT- II

a. **Text: Unit-III** Ushering in a New Era: Networking
   Unit-IV Inspiring Minds: Successful People
b. **Grammar:**Tenses, Conditionals
c. **Writing:**Essay Writing: Descriptive, Argumentative, Imaginative, Narrative
d. **Vocabulary** from the suggested units (Given List)

UNIT- III

a. **Text: Unit-V** Morphed Universe**:** Technology as a double Edged Sword
   Unit-VI The Indomitable Human Spirit: Facing Disasters
b. **Grammar:** Articles, Reported Speech, Voices
c. **Writing:** Letter Writing (Inquiry, Complaint & Request Letters) & Summarizing
d. **Vocabulary** from the suggested units (Given List)

UNIT- IV

a. **Text: Unit-VII** Getting Job Ready: Interview Skills
   Unit-VIII The World of Work: The Corporate Experience
b. **Grammar:** Common Errors
c. **Writing:** Note Making, Technical Report Writing
d. **Vocabulary** from the suggested unit (Given List)

Prescribed Text

DrElango, DrVeenaSelvam, DrPriyadarshiniSujatha (2013): Resonance: English for Engineers and Technologists, CUP.

References:

Michael Swan (2003): Practical English Usage, CUP.
Stephen, McLaren (2003): Easy Writer Student's Guide to Writing Essays and Reports, New Delhi, Viva Books Pvt.
Raymond Murphy (2012): English Grammar in Use (Fourth Edition), CUP.
Lina Mukhopadhyay (2013): English for Jobseekers, CUP.
R.C Sharma (2010): Business Correspondence and Report writing (Fourth Edition), Tata McGraw Hill.

Environmental Studies
(Common for all branches)
I B.Tech – II Semester (Code: 14ES205 / 14ES105)

Lectures	4	Tutorial	0		Practical	0	Self Study	0	
Continuous Internal Assessment			:	40	Semester End Examination (3 Hours)			:	60

UNIT – I

Introduction: Definition, Scope and Importance, Need for public awareness. Ecosystems: Definition, Structure and Functions of Ecosystems, types - Forest, Grassland, Desert, Aquatic (Marine, pond and estuaries).

Biodiversity: Definition and levels of Biodiversity; Values of Biodiversity - Consumptive, Productive, Social, Aesthetic, Ethical and Optional; Threats and Conservation of Biodiversity; Hot Spots of Biodiversity, Bio-geographical Classification of India, India as a mega diversity nation.

UNIT – II

Natural resources: Land: Land as a resource, Causes and effects of land degradation - Soil erosion, Desertification. Forest: Use of forests, Causes and effects of deforestation, Afforestation, Mining - benefits and problems. Water: Uses, floods and drought, Dams - benefits and problems. Energy: Importance of energy, Renewable and Non renewable energy resources.

Sustainability: Definition, Concept and Equitable use of resources for sustainable development; Rain water harvesting and Watershed management.

UNIT – III

Pollution: Definition; Causes, effects and control of air, water and nuclear pollution; Solid Waste: urban, Industrial and hazardous wastes; Integrated waste management - 3R approach, composting and vermicomposting.

Environmental issues: Green house effect & Global warming, Ozone layer depletion, Acid rains, Green Revolution, Population Growth and environmental quality, Environmental Impact Assessment.

UNIT – IV

Environmental acts: Water and air (Prevention and Control of pollution) acts, Environmental protection act, Forest Conservation act. Case Studies: Silent Valley Project, Chipko movement, Narmada BachaoAndolan, Bhopal Tragedy, Mathura Refinery and TajMahal, Chernobyl Nuclear Disaster and Ralegan Siddhi (Anna Hazare).

Field work: Visit to a local area to document environmental assets – Pond/Forest/Grassland. Visit to a local polluted site- Urban and industry/ Rural and Agriculture.

TEXT BOOKS:

1. "Environmental Studies" by Benny Joseph, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. "Comprehensive environmental studies"- JP Sharma, Laxmi Publications.

REFERENCE BOOKS:

1. "Environmental studies", R.Rajagopalan, Oxford University Press.
2. "Introduction to Environmental Science", Anjaneyulu Y, B S Publications
3. "Environmental Science", 11th Edition – Thomson Series – By Jr. G. Tyler Miller.

Engineering Graphics
(Common for all branches)
I B.Tech – II Semester (Code: 14EG206 / 14EG106)

Lectures	4	Tutorial	1	Practical	0	Self Study	1
Continuous Internal Assessment	:	40		Semester End Examination (3 Hours)		:	60

UNIT – I

INTRODUCTION: Introduction to Drawing instruments and their uses, geometrical construction procedures.

CURVES: Conic sections – general construction methods for ellipse, parabola and hyperbola. Other methods to construct ellipse only, cycloid, involute of a circle.

UNIT – II

METHOD OF PROJECTIONS: Principles of projection - First angle and third angle projection of points. Projection of straight lines. Traces of lines.

UNIT – III

PROJECTIONS OF PLANES: Projections of plane figures: circle, square, rhombus, rectangle, triangle, pentagon and hexagon.

UNIT – IV

PROJECTIONS OF SOLIDS: Projections of Cubes, Prisms, Pyramids, Cylinders and Cones with varying positions.

UNIT – V

ISOMETRIC PROJECTIONS: Isometric Projection and conversion of Orthographic views into isometric views. (Treatment is limited to simple objects only).

ORTHOGRAPHIC PROJECTIONS: Conversion of pictorial views into Orthographic views. (Treatment is limited to simple castings).

TEXT BOOK:

1. "Engineering Drawing" by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House, Anand). (First angle projection)

REFERENCE BOOKS:

2. "Engineering Drawing" by Dhananjay A Jolhe, Tata McGraw hill publishers
3. "Engineering Drawing" by Prof.K.L.Narayana& Prof. R.K.Kannaiah.

Chemistry Laboratory
(Common for all branches)
I B.Tech – II Semester (Code: 14CYL201 / 14CYL101)

Lectures	0	Tutorial	0	Practical	3	Self Study	0
Continuous Internal Assessment	: 40			Semester End Examination (3 Hours)		:	60

LIST OF EXPERIMENTS

1. **Introduction to Chemistry Lab** (the teachers are expected to teach fundamentals likeCalibration of Volumetric Apparatus, Primary, Secondary Solutions, Normality, Molarity, Molality etc. and error, accuracy, precision, theory of indicators, use of volumetric titrations).

2. **Volumetric Analysis:**
   a. Estimation of Washing Soda.
   b. Estimation of Active Chlorine Content in Bleaching Powder
   c. Estimation of Mohr's salt by permanganometry.
   d. Estimation of Magnesium by EDTA method
3. **Analysis of Water:**
   a. Determination of Alkalinity of Tap water.
   b. Determination of Total Hardness of ground water sample by EDTA method
   c. Determination of Salinity of water sample
4. **Estimation of properties of oil**:
   a. Estimation of Acid Number
   b. Estimation of Saponification value
5. **Preparations:**
   a. Preparation of Soap
   b. Preparation of Urea-formaldehyde resin
   c. Preparation of Phenyl benzoate
6. **Demonstration Experiments (Any two of the following):**
   5.1 Determination of p^H of given sample by different methods.
   5.2 Determination of conductivity of given sample by conductometer.

TEXT BOOKS (for Chemistry 1 and 2):

1. Practical Engineering Chemistry by K.Mukkanti, Etal, B.S. Publicaitons, Hyderabad.
2. Inorganic quantitative analysis, Vogel.

REFERENCE BOOKS:

1. Text Book of engineering chemistry by R.n. Goyal and HarrmendraGoel.
2. A text book on experiments and calculations- Engineering Chemistry. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

English Communication Skills Laboratory
(Common for all branches)
I B.Tech – II Semester (Code: 14ELL202 / 14ELL102)

Lectures	0	Tutorial	0	Practical	3	Self Study	0
Continuous Internal Assessment	: 40			Semester End Examination (3 Hours)		:	60

UNIT-I: Functional English
Introducing Yourself & Others-Greeting & Parting-Congratulating-Giving Suggestions & Advices-Expressing Opinions-Inviting People-Requesting-Seeking Permission-Giving Information- Giving Directions- Sympathizing-Convincing People-Complaining-Apologizing-Thanking Others- Shopping- Travelling- Conversational Gambits.

UNIT-II
Phonetics (Oral drills) - Stress- Rhythm & Intonation.

UNIT-III Vocabulary Development & Oratory Skills
Classified Vocabulary- Idioms - Phrasal verbs - Words often confused- Analogous words- Corporate Words - JAM- Elocution- Debate.

UNIT-IV Manners and Etiquette
Giving & Receiving Feedback -Telephone Etiquette - Gender Sensitive Language.

Reference Books:
J.D. O' Connor (1984): Better English pronunciation Cambridge University Press
Jack C Richards (2015)**:** New Interchange (4rth Edition) , CUP.
Grant Taylor (2001: English Conversation Practice, McGraw Hill.
MichealMcCarthy, Felicity O Dell (1994)**:** English Vocabulary in Use, CUP.
Software:
Buzzers for conversations, New Interchange series
English in Mind series, telephoning in English
Speech Solutions, A course in Listening and Speaking
Face to Face series

Workshop

(Common for all branches)

I B.Tech – II Semester (Code: 14WSL203 / 14WSL103)

Lectures	0	Tutorial	0	Practical	3	Self Study	0
Continuous Internal Assessment	: 40			Semester End Examination (3 Hours)		:	60

LIST OF EXPERIMENTS

1. **Carpentry**
   a. Half Lap joint
   b. Dovetail joint
   c. Mortise &Tenon joint
2. **Welding using electric arc welding process/gas welding**
   a. Lap joint
   b. Tee joint
   c. Butt joint
3. **Sheet metal operations with hand tools**
   a. Trapezoidal tray
   b. Funnel
   c. T-joint
4. **House wiring**
   a. To control one lamp by a single switch
   b. To control two lamps by a single switch
   c. Stair-case wiring

ENGINEERING MATHEMATICS – III
II B.Tech – III Semester (Code: 14MA301)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Fourier integrals: From Fourier series to the Fourier integral, Application of the Fourier integral, Fourier Cosine and Sine integral, Evaluation of integrals, Fourier cosine and sine Transforms: Fourier Cosine Transforms, Fourier Sine Transforms, Linearity, Transforms of Derivatives, Fourier Transform: Complex form of the Fourier integral, Fourier Transform and its inverse, Linearity. Fourier Transform of Derivatives, Convolution.

UNIT – II **(13 Periods)**

Partial differential equations: Basic concepts, Modeling-Vibrating string, Wave Equation Separation of Variables Use of Fourier series, D'Alembert's Solution of the Wave Equation, Heat Equation-Solution Fourier series, Steady-State Two-Dimensional Heat Flow.

UNIT – III **(12 Periods)**

Numerical Methods in general: Introduction, Solution of Equations by Iteration, newton's Method for Solving Equations f(x) = 0, Convergence of Newton's method, Interpolation: Lagrange interpolation, Newton's divided difference interpolation, Equal spacing: Newton's forward Difference formula, Newton's Backward Difference formula, Inverse interpolation, Numerical integration and Differentiation: Trapezoidal Rule, Error Bounds and Estimate for the Trapezoidal Rule, Simpson's Rule of integration, Error of Simpson's rule.

UNIT – IV **(12 Periods)**

Numerical methods in linear algebra: Linear Systems: Gauss Elimination, LU Factorization, Gauss-Seidel iteration Method, Method of least Squares, Methods of First order Differential Equations: Euler's method, Runge-Kutta methods, Methods for Elliptic Partial Differential Equations: Laplace equation, Poisson equation.

TEXT BOOK:

1. "Advanced Engineering Mathematics", Erwin Kreyszig, 9th edition, John Wiley & Sons.

REFERENCE BOOKS:

1. "Advanced Engineering Mathematics", Peter V. O'Neil, Thomsons Brooks/Cole.

DISCRETE MATHEMATICAL STRUCTURES

II B.Tech – III Semester (Code: 14CS302)

Lectures	:	4 Periods/Week,Tutorial:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 Periods)**

Foundations: Sets, Relations and Functions, Fundamentals of Logic, Logical Inferences, Methods of Proof of an implication, First order Logic & Other methods of proof, Rules of Inference for Quantified propositions, Mathematical Induction.

UNIT – II **(15 Periods)**

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with repetitions, Enumerating Permutation with Constrained repetitions.

Recurrence relations: Generating functions of sequences, Calculating Coefficients of Generating Functions.

UNIT – III **(15 Periods)**

Recurrence Relations: Solving recurrence relations by Substitution and generating functions. The methods of characteristic roots, solutions of inhomogeneous recurrence relations.

Relations and digraphs: Special properties of binary relations, Operations on relation.

UNIT – IV **(14 Periods)**

Ordering relations, Lattice, Paths and Closures, Directed Graphs and Adjacency Matrices, Application: Topological Sorting.

Graphs: Basic Concepts, Isomorphisms and Subgraphs, Planar Graphs, Euler's Formula; Multigraphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four Color Problem.

TEXT BOOK:

1. Toe L.Mott, Abraham Kandel& Theodore P.Baker, "Discrete Mathematics for Computer Scientists & Mathematicians", PHI 2nd edition.

REFERENCE BOOKS:

1. C.L. Liu, "Elements of Discrete Mathematics".
2. Rosen, "Discrete Mathematics".

DIGITAL LOGIC DESIGN

II B.Tech – III Semester (Code: 14CS303)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Review of Number systems & codes, Representation of integers and Floating point numbers, Accuracy, Introduction to integer arithmetic operations.

BOOLEAN ALGEBRA AND LOGIC GATES: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and Properties of Boolean Algebra, Boolean functions, Canonical and Standard Forms, Other operations, Digital Logic Gates.

SIMPLIFICATION OF BOOLEAN FUNCTIONS: The Map Method, Two and three variable Maps, Four-variable Map, Five and six-variable Maps, Product of Sums Simplification, NAND and NOR implementation, Don't-Care conditions.

UNIT – II **(13Periods)**

SIMPLIFICATION OF BOOLEAN FUNCTIONS: The Tabulation Method, Determination of Prime Implicants, Selection of Prime-Implicants.

COMBINATIONAL LOGIC: Design Procedure, Adders, Subtractors, Code conversion, Analysis procedure.

COMBINATIONAL LOGIC WITH MSI AND LSI: Binary parallel adder, Decimal adder, Magnitude comparator, Decoders, Multiplexers.

UNIT – III **(12 Periods)**

SEQUENTIAL LOGIC: Flip Flops, Triggering of Flip-Flops, Synthesis and Analysis of Clocked Sequential Circuits, State tables and State diagrams, State Reduction and assignment, Flip-Flop Excitation tables, Design Procedure, Design of counters, Design with state equations.

UNIT – IV **(12 Periods)**

REGISTERS, COUNTERS: Registers, Shift registers, Ripple counters, Synchronous counters, Timing sequences.

MEMORIES: Classification of ROMs, EPROMs, EEPROMs, RAMs.

PROGRAMMABLE LOGIC: Read only memory (ROM), Programmable logic device (PLD), and Programmable logic array (PLA), and Programmable array logic (PAL).

TEXT BOOK:

1. Morris Mano, “Computer Engineering Hardware Design”, PHI.
2. A.Anandkumar, “Fundamentals of digital circuits”, 4th edition, PHI.

REFERENCE BOOKS:

1. R.P.Jain, “Modern digital electronics”, 3rd edition, TMH.
2. Donald e Givone, “Digital Principles and Design”, TMH.

OPERATING SYSTEMS
II B.Tech – III Semester (Code: 14CS304)

Lectures	:	4 Periods/Week, Self Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I (16 Periods)

Introduction: What OSs Do? OS Structure, OS Operations, Process Management, Memory Management, Storage Management, Protection and Security.

System Structures: OS Services, System Calls, Types of System Calls, System Programs, OS Design and Implementation, OS Structure.

Process-Concept: Process Concept, Process Scheduling, Operations on Processes, Inter-process Communication.

Multithreaded Programming: Overview, Multithreading Models.

UNIT – II (15 Periods)

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms.

Synchronization: Background, Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic problems of Synchronization, Monitors.

UNIT – III (15 Periods)

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Avoidance, Detection and Recovery.

Memory-Management Strategies: Background, Swapping, Contiguous Memory Allocation, Paging, Structure of Page Table, Segmentation.

Virtual-Memory Management: Background, Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Other Considerations.

UNIT – IV (14 Periods)

File systems: File Concept, Access Methods, Directory and Disk Structure, File Sharing.

I/O

Protection

TEXT BOOK:

1. Silberschatz & Galvin, "Operating System Concepts", 8th edition, John Wiley & Sons (Asia) Pvt.Ltd.,.

REFERENCE BOOKS:

1. William Stallings, "Operating Systems – Internals and Design Principles", 5/e, Pearson.
2. Charles Crowley, "Operating Systems: A Design-Oriented Approach", Tata McGraw Hill Co., 1998 edition.
3. Andrew S.Tanenbaum, "Modern Operating Systems", 2nd edition, 1995, PHI.

DATA STRUCTURES

II B.Tech – III Semester (Code: 14CS305)

Lectures	:	4 Periods/Week,Tutorial:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 Periods)**

Algorithm Analysis: Mathematical Back Ground, Model, What to Analyze, Running Time Calculations.

Lists: Abstract Data Types, The List ADT, Singly Linked List ADT, Doubly Linked List ADT, Circular Linked List ADT, Polynomial ADT: addition, multiplication operations.

UNIT – II **(15 Periods)**

Stacks and Queues: The Stack ADT and its applications such as Infix to Postfix expression conversions, Evaluation of Postfix expressions. The Queue ADT, Queue Application-Radix sort.

Sorting Preliminaries: Shellsort, Mergesort, Quicksort.

UNIT – III **(15 Periods)**

Trees: Preliminaries, Binary Trees, Expression trees, The Search Tree ADT, Binary Search Trees, Implementation. AVL Trees, Single Rotations, Double rotations, Implementations.

UNIT – IV **(14 Periods)**

Hashing: General Idea, Hash Function, Separate Chaining, Open Addressing, Linear Probing, Priority Queues (Heaps), Model, Simple implementations, Binary Heap, Heap Sort.

Graphs: Definitions, Representations: Adjacency matrices and lists, Graph traversals: Depth first, Breadth first.

TEXT BOOK:

1. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Second Edition, Pearson Education.

REFERENCE BOOKS:

1. Y.Langsam, M.J.Augeustein and A.M.Tenenbaum, “Data Structures Using C”, Pearson Education Asia, 2004.
2. Richard F.Gilberg, Behrouz A. Forouzan, “Data Structures – A Pseudocode Approach with C”, ThomsonBrooks / COLE, 1998.
3. Aho, J.E. Hopcroft and J.D. Ullman, “Data Structures and Algorithms”, Pearson Education Asia, 1983.

OBJECT ORIENTED PROGRAMMING
II B.Tech – III Semester (Code: 14CS306)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

The Creation of C#
An Overview of C#
Data Types, Literals, and Variables
Operators
Program Control Statements
Introducing Classes and Objects
Arrays and Strings
A Closer Look at Methods and Classes

UNIT – II **(13 Periods)**

Operator Overloading
Indexers and Properties: Properties, Use Access Modifiers with Accessors
Inheritance
Interfaces, Structures, and Enumerations

UNIT – III **(12 Periods)**

Exception Handling
Using I/O: C#'s I/O Is Built Upon Streams, The Stream Classes, Console I/O, FileStream and Byte-Oriented File I/O, Character-Based File I/O, Redirecting the Standard Streams.
Delegates, Events-Delegates, Anonymous Functions, Anonymous Methods, Events.

UNIT – IV **(12 Periods)**

Namespaces, the Preprocessor, and Assemblies
Generics: What Are Generics?, A Simple Generics Example, A Generic Class with Two Type Parameters, The General Form of a Generic Class, Creating a Generic Method, Generic Interfaces.
Collections, Enumerators, and Iterators: Collections Overview, The Non-Generic Collections::The Non-Generic Interfaces, The Dictionary Entry Structure, The Non-Generic Collection Classes:::ArrayList, Hashtable, The Generic Collections:: The Generic Interfaces, The KeyValuePair <TKey, TValue> Structure, The Generic Collection Classes::: The Dictionary<TKey, TValue> Class.

Text Book:

1. C# 4.0 The Complete Reference by Herbert Schildt, Tata McGraw Hill, 2010.

Reference Books:

1. Programming C# 5.0 by *Ian Griffiths,* O'REILLY, 2012.
2. Programming C#, 2nd Edition, O'REILLY, 2002.
3. Programming C# 3.0, Fifth Edition, Jesse Liberty & Donald Xie, O'Reilly Publ.

SOFT SKILLS LAB

II B.Tech – III Semester (Code: 14ELL301)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. **BODY LANGUAGE**
   a. Facial Expressions.
   b. Kinesics.
   c. Oculesics.
   d. Haptics.
   e. Proxemics.
   f. Para Linguistics.
2. **LIFE SKILLS**
   a. Positive Attitude
   b. Social Behavior & Social Norms.
   c. Ethics, Values and Positive Work Ethics.
   d. Time Management
   e. Goal Setting, Vision, Mission.
3. **EMOTIONAL INTELLIGENCE**
   a. Self Awareness through Johari Window and SWOT analysis.
   b. Self Control.
   c. Self Motivation.
   d. Empathy.
   e. Social Skills.
   f. Self Esteem.
   g. Managing stress.
   h. Assertiveness.
4. **PROBLEM SOLVING SKILLS**
   a. Critical Thinking and Brain Storming
   b. Lateral Thinking and Six Thinking Hats.
   c. Creative Thinking.
   d. Conflict Management.
5. **EMPLOYABILITY SKILLS**
   a. Group Discussion.
   b. Team Building and Leadership Qualities
   c. Interview Skills.

RFFERENCE BOOKS:

1. "The Definitive Book Of Body Language", Allan & Barbara Pease
2. "You Can Win", Shiv Khera.
3. "Lateral Thinking", Edward De Bono.
4. "How To Prepare For Group Discussions And Interview", Hari Mohan Prasad, Rajnish Mohan, 2nd Edition, TMH.
5. "Emotional Intelligence", Daniel Goleman.
6. " The 7 Habits Of Highly Effective People", Stephen R. Covey
7. "Working in Teams", Sandy Pokras.

DATA STRUCTURES LAB

II B.Tech – III Semester (Code: 14CSL302)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Code the following list ADT operations using array, single linked list, double linked list.
   (a) void is_emptyList(List L)
   (b) List makeNullList(size n)
   (c) Position firstPost(List L)
   (d) Position endPost(List L)
   (e) Position nextPost(List L, Position p)
   (f) Position prevPos(List L, position p)
   (g) Position find(List L, Element x)
   (h) Position findKth(List L, int k)
   (i) void insert(List L, Position p)
   (j) void delete(List L, Position p)
   (k) void append(List L, Element x)
   (l) int cmp(List L, Position p1, Position p2)
   (m) int cmp2(List L, List L, Position p1, Position p2)
   (n) void swap(List L, Position p1, Position p2)
   (o) Element retrieveElement(List L, Position p)
   (p) void printElement(List L, Position p)

2. Using the above List ADT operations, Write a menu driven program to support following higher level list operations:
   (a) Create null list
   (b) Read a list of elements into the list.
   (c) Insert an element in the K^{th} position of the list
   (d) Delete an element in the K^{th} position of the list
   (e) Delete a given element from the list
   (f) Find whether given element is present in the list
   (g) Display the elements of the list
3. Write a program that reads two lists of elements, prints them, reverses them, prints the reverse list, sort the lists, print the sorted lists, merges the list, prints merge list.
4. Implement a polynomial ADT and write a program to read two polynomials and print them, adds the polynomials, prints the sum, multiply the polynomials and print the product.

5. Implement stack ADT and write a program that reads an infix arithmetic expression of variables, constants, operators (+, -, *, /) and converts it into the corresponding postfix form. Extend the program to handle parenthesized expression also.
6. Implement Queue ADT and write a program that performs Radix sort on a given set of elements.
7. Implement the following sorting operations:-
   (a) Shell Sort
   (b) (b) Heap Sort
   (c) (c) Merge Sort
   (d) (d) Quick Sort
8. Implement Binary Tree ADT and write a program that reads postfix Arithmetic expression form, builds the expression tree and performs tree Traversal on it.
9. Implement Binary search ADT and write a program that interactively allows
   (a) Insertion (b) Deletion (c) Find_min (d) Find_max (e) Find operations
10. Implement AVL Tree ADT and Write a program that interactively allows
    (a) Insertion (b) Deletion (c) Find_min (d) Find_max
    Implement Hashing and Write a program to find a element using Open Addressing.

OBJECT ORIENTED PROGRAMMING LAB

II B.Tech – III Semester (Code: 14CSL303)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Implement a class List and the list operations. Use all possible basic features of C#.
2. Write a C# program to demonstrate Arrays (2-D and jagged).
3. Design a class to demonstrate String class methods.
4. Design an appropriate class that represents a mathematical entity and provide the operations with Operator Overloading.
5. Implement a class hierarchy with Abstract Classes, Virtual methods & Overriding.
6. Implement a class clock that publishes seconds change event. Design classes that subscribe to the event with respective behaviours.
7. Design a Data Structure with Exception Handling.
8. Write a program to demonstrate Generic Class Generic Method.
9. Write a program to demonstrate Collections and Generic Collections.
10. Write a C# program to determine the Generic Classes Generic Methods and Generic Interfaces.

ENGINEERING MATHEMATICS – IV

II B.Tech – IV Semester (Code: 14MA401)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(14 Periods)**

Complex numbers and functions: Introduction to Complex Numbers, Complex Plane, Polar form of Complex numbers, Powers and roots, Derivative, Analytic Function, Cauchy - Riemann Equations, Laplace's equation.

Complex Integration: Cauchy's Integral Theorem, Cauchy's Integral Formula.

UNIT – II **(12 Periods)**

Taylor, Laurent series and Residue Integration: Taylor Series (without proof) and McLaren series, Laurent Series(without proof), singularities and zeros, infinity, Residue Integration method, Evaluation of real integrals.

UNIT – III **(12 Periods)**

Probability Densities: Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Joint Distributions, Discrete and Continuous.

Sampling Distribution: Populations and Samples, Sampling Distribution of the Mean (σ known), Sampling Distribution of the Mean (σ Unknown), Sampling Distribution of the Variance.

UNIT – IV **(12 Periods)**

Inferences Concerning Means: Point Estimation, Interval Estimation, Tests of Hypotheses, Null Hypotheses and significance of tests, Hypotheses Concerning one Mean, Inferences Concerning Two Means.

Inferences Concerning Variances: Estimation of Variances, Hypotheses Concerning One Variance, Hypotheses Concerning Two Variances.

Inferences Concerning Proportions: Estimation of Proportions, Hypotheses Concerning One Proportion

TEXT BOOK:

1. "Advanced Engineering Mathematics", Erwin Kreyszig, 9th Edition, John Wiley, 2000.
2. Miller & Freund's "Probability and Statistics for Engineers", Richard A. Johnson, 8th Edition, PHI.

REFERENCE BOOK:

1. "Theory and Problems of Complex Variables", Murray R Spiegel, Schaum's outline series.

PROFESSIONAL ETHICS & HUMAN VALUES
II B.Tech – IV Semester (Code: 14CS402)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(14 Periods)**

Human Values: Morals, Values and Ethics, Integrity, Work Ethics, Service and Learning, Civic Virtue, Respect for Others, Living Peacefully, Caring and Sharing, Honesty, Courage, Value Time, Cooperation, Commitment and Empathy, Spirituality, Character.

Engineering Ethics: History of Ethics, Engineering Ethics, Consensus and Controversy, Profession and Professionalism, Professional Roles of Engineers, Self Interest, Customs and Religion, Uses of Ethical Theories, Professional Ethics, Types of Inquiry, Kohlberg's Theory, Gilligan's Argument, Heinz's Dilemma.

Engineering as Social Experimentation: Comparison with Standard Experiments, Knowledge Gained, Conscientiousness, Relevant Information, Learning from the Past, Engineers as Managers, Consultants, and Leaders, Accountability, Roles of Codes, Codes and Experimental Nature of Engineering.

UNIT – II **(12 Periods)**

Engineers' Responsibility for Safety and Risk: Safety and Risk, Types of Risks, Safety and the Engineer, Designing for Safety, Risk-Benefit Analysis, Accidents.

Responsibilities and Rights: Collegiality, Two Senses of Loyalty, Obligations of Loyalty, Misguided Loyalty, Professionalism and Loyalty, Professional Rights, Professional Responsibilities, Conflict of Interest, Self-interest, Customs and Religion, Collective Bargaining, Confidentiality, Acceptance of Bribes/Gifts, Occupational Crimes, Whistle Blowing.

UNIT – III **(12 Periods)**

Global Issues: Globalization, Cross-cultural Issues, Environmental Ethics, Computer Ethics, Weapons Development, Ethics and Research, Analyzing Ethical Problems in Research, Intellectual Property Rights (IPRs).

Ethical Audit: Aspects of Project Realization, Ethical Audit Procedure, The Decision Makers, Variety of Interests, Formulation of the Brief, The Audit Statement, The Audit Reviews.

UNIT – IV **(12 Periods)**

Case Studies: Bhopal Gas Tragedy, The Chernobyl Disaster.

Appendix 1: Institution of Engineers (India): Sample Codes of Ethics.

Appendix 2: ACM Code of Ethics and Professional Conduct.

TEXT BOOK:

1. "Professional Ethics & Human Values", M.GovindaRajan, S.Natarajan, V.S.SenthilKumar, PHI Publications 2013.

REFERENCE BOOKS:

1. "Ethics in Engineering", Mike W Martin, Ronald Schinzinger, TMH Publications.

COMPUTER ORGANIZATION

II B.Tech – IV Semester (Code: 14CS403)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 Periods)**

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers.

MACHINE INSTRUCTIONS AND PROGRAMS: Numbers, Arithmetic Operations and Characters, Memory locations and addresses, Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations, Subroutines, Additional Instructions.

UNIT – II **(15 Periods)**

BASIC PROCESSING UNIT: Some fundamental concepts, Execution of a complete instruction, Multiple –Bus Organization, Hardwired control, Micro programmed control.

ARITHMETIC: Addition and Subtraction of Signed Numbers, Multiplication of Positive numbers, Signed operand multiplication, Fast multiplication, Integer Division, Floating point numbers and operations.

UNIT – III **(15 Periods)**

THE MEMORY SYSTEM: Some Basic Concepts, Semiconductor RAM Memories, Read-Only memories, Speed, Size and Cost, Cache Memories, performance Considerations, Virtual memories, Memory management Requirements, Secondary Storage.

PIPELINING: Basic Concepts, Data Hazards, Instruction hazards, Influence on Instruction Sets, Data path and Control Considerations, Superscalar Operation, performance Considerations.

UNIT - IV **(14 Periods)**

INPUT/OUTPUT ORGANIZATION: Interrupts, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces: PCI Bus, SCSI Bus, USB Bus.

TEXT BOOK:

1. “Computer Organization”, Carl Hamacher, ZvonkoVranesic, SafwatZaky, Fifth Edition, McGraw Hill.

REFERENCE BOOKS:

1. “Computer Architecture and Organization”, John P. Hayes, Third Edition, McGraw Hill.
2. “Computer Organization and Architecture”, William Stallings, 6th Edition, Pearson/PHI.
3. “Computer Systems Architecture”, M. Morris Mano, Third Edition, Pearson/PHI.

DESIGN AND ANALYSIS OF ALGORITHMS

II B.Tech – IV Semester (Code: 14CS404)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 Periods)**

Introduction: Algorithm Design paradigms – motivation, concept of algorithmic efficiency, run time analysis of algorithms, Asymptotic Notations.

Divide and Conquer: General method, Merge sort, Quick sort, Strassen's Matrix Multiplication.

UNIT – II **(15 Periods)**

Greedy Programming: The general method, Knapsack problem, Job sequencing with deadlines, Minimum Spanning Trees – Prim's Algorithm and Kruskal's algorithm, Single source shortest paths – Dijkstra's Algorithm.

Dynamic Programming: The general method, Multi stage Graphs – Forward & Backward Approach, longest Common sequence, 0/1 knapsack, Reliability design, Traveling Salesman Problem.

UNIT – III **(15 Periods)**

Graph Searching and Traversal: Techniques for Graphs – Breath First Search and Traversal, Depth First Search and Traversal, strongly connected components.

Back tracking: The general method, The 8-Queens problem, Sum of subsets, Knapsack problem.

UNIT – IV **(14 Periods)**

Branch and Bound: The general method– Least Cost search, control abstract for LC- Search, Bounding, FIFO branch and bound, LC branch and bound , 0/1 Knapsack problem - LC branch and bound solution, FIFO branch and bound, Travelling Salesman Problem.

Computational Complexity: Complexity measures, Polynomial Vs Non-polynomial time complexity; The classes NP-hard and NP-complete.

TEXT BOOK:

1. E. Horowitz, S. Sahni and S.Rajsekran, "Fundamentals of Computer Algorithms", Galgotia Publication.

REFERENCE BOOKS:

1. T. H. Cormen, Leiserson, Rivest and Stein, "Introduction of Computer Algorithm", PHI.
2. Sara Basse, A.V. Gelder, "Computer Algorithms", Addison Wesley.

GUI PROGRAMMING

II B.Tech – IV Semester (Code: 14CS405)

Lectures	:	4 Periods/Week, Self Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 Periods)**

Introduction: Introduction to java, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.

Classes and Objects : Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Inheritance: Basic concepts, access specifires, usage of super key word, method overriding, final methods and classes, abstract classes, dynamic method dispatch, Object class.

Interfaces: Differences between classes and interfaces, defining an interface, implementing interfaces, Nested Interfaces, variables in interface and extending interfaces, Default Interface Methods, static Methods in an Interface.

Packages: Creating a Package, setting CLASSPATH, Access control protection, importing packages.

UNIT – II **(14 Periods)**

Strings: Exploring the String class, String buffer class, Command-line arguments.

Library: Date class, Collection, Enumerations and Wrapper classes.

Exception Handling: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes.

Multithreading : Concepts of Multithreading, differences between process and thread, thread life cycle, Thread class, Runnable interface, creating multiple threads, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

UNIT – III **(14 Periods)**

I/O Streams: Streams, Byte streams, Character streams, File class, File streams.

Applets: Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets, accessing remote applet, Color class and Graphics

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.

UNIT – IV **(16 Periods)**

AWT: AWT Components, windows, canvas, panel, File Dialog boxes, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menubar.

Swings – swings introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields,buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

TEXT BOOKS:

1. "Java The Complete Reference", 9th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.

REFERENCE BOOKS:

1. "Big Java", 2nd Edition, Cay Horstmann, John Wiley and Sons,PearsonEdu(UNIT–IV).
2. "Java How to Program", Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
3. "Core Java 2", Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
4. "Core Java 2", Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
5. "Beginning in Java 2", Iver Horton, Wrox Publications.
6. "Java", Somasundaram, Jaico.
7. "Introduction to Java programming", By Y.DanielLiang,Pearson Publication.

WEB TECHNOLOGIES

II B.Tech – IV Semester (Code: 14CS406)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

HTML5: Fundamentals of HTML, Working with Text, Organizing Text in HTML, Working with Links and URLs, Working with Images, Colors, and Canvas, Working with Forms, Working with Multimedia. Overview of CSS, Backgrounds and Color Gradients in CSS, Fonts and Text Styles, Creating Boxes and Columns Using CSS, Displaying, Positioning, and Floating an Element, List Styles, Table Layouts.

UNIT – II **(13 Periods)**

Dynamic HTML: Overview of JavaScript, JavaScript Functions, Events, Image Maps, and Animations, JavaScript Objects, Working with Browser Objects, Working with Document Object.

UNIT – III **(12 Periods)**

Document Object Model, XML: Working with Basics of XML, Implementing Advanced Features of XML, Converting XML Documents in Other Formats, Working with XSLT.

UNIT – IV **(12 Periods)**

AJAX: Overview of AJAX, Asynchronous Data Transfer with XMLHttpRequest, Implementing AJAX Frameworks, Working with jQuery.

TEXT BOOK:

1. Kogent Learning Solutions Inc.,**HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and Jquery.**

REFERENCE BOOKS:

1. Harvey M. Deitel and Paul J. Deitel,“Internet & World Wide Web How to Program”, 4/e,Pearson Education.
2. Jason Cranford Teague, “Visual Quick Start Guide CSS, DHTML &AJAX”, 4e, Pearson Education.
3. Tom NerinoDoli smith, “JavaScript & AJAX for the web”, Pearson Education 2007.
4. Joshua Elchorn, “Understanding AJAX”, Prentice Hall 2006.

DESIGN AND ANALYSIS OF ALGORITHMS LAB

II B.Tech – IV Semester (Code: 14CSL401)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Write a Program to Implement Merge sort
2. Write a Program to Implement Quick sort
3. Write a Program to Implement Strassen'sMatrix Multiplication
4. Write a Program to Implement Prim's Algorithm
5. Write a Program to Implement Kruskal's Algorithm
6. Write a Program to Implement Dijkstra's Algorithm
7. Write a Program to Implement longest common sequence algorithm
8. Write a Program to Implement Multi-stage graphs using Forward & Backward approach
9. Find the strongly connected components of a graph
10. Write a Program to Implement N – Queens Problem
11. Write a Program to Implement Sum of Subsets Problem
12. Write a Program to Implement LC branch and bound algorithm for Traveling Salesman problem

GUI PROGRAMMING LAB

II B.Tech – IV Semester (Code: 14CSL402)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Write a java program to demonstrate static member, static method and static block.

2. Write a java program to demonstrate method overloading and method overriding.

3. Write a java program to implement multiple inheritance.

4. Write a java program to demonstrate finals, blank finals, final methods, and final classes.

5. Write a program to demonstrate packages.

6. Write a java program to demonstrate interfaces.

7. Write a java program to crate user defined exception class and test this class.

8. Write a java program to demonstrate synchronous keyword.

9. Write am applet program to demonstrate Graphics class.

10. Write GUI application which uses awt components like label, button, text filed, text area, choice, checkbox, checkbox group.

11. Write a program to demonstrate MouseListener, MouseMotionListener, KeyboardListener, ActionListener, ItemListener.

12. Develop swing application which uses JTree, JTable, JComboBox.

WEB TECHNOLOGIES LAB

II B.Tech – IV Semester (Code: 14CSL403)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Demonstrate all the basic tags in HTML5.
2. Write codes for different types of styles in CSS3.
3. Write java scripts covering Function, recursive functions, Arrays and Objects.
4. Demonstrate collection objects.
5. Demonstrate event model.
6. Write well-formed and valid XML documents.
7. Write code for displaying XML using XSL.
8. Demonstrate Document Object Model for an XML document.
9. Demonstrate Validating an Input Field using AJAX.
10. Build a webpage using JQuery and its components.

SOFTWARE ENGINEERING
III B.Tech – V Semester (Code: 14CS501)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

INTRODUCTION TO SOFTWARE ENGINEERING: The Evolving Role of Software, Software, the Changing Nature of Software, Legacy Software, Software Myths.

A GENERIC VIEW OF PROCESS: Software Engineering - A Layered Technology, a Process Framework, the CMMI, Process Patterns, Process Assessment, Personal and Team Process Models, Product and Process.

PROCESS MODELS: Prescriptive Models, the Waterfall Model, Incremental Process Models, Evolutionary Models, the Unified Process.

AN AGILE VIEW OF PROCESS: What Is Agility? , What Is an Agile Process? , Agile Process Models.

UNIT – II **(12 Periods)**

SOFTWARE ENGINEERING PRACTICE: Software Engineering Practice, Communication Practices, Planning Practices, Modeling Practices, Construction Practice, Deployment.

REQUIREMENTS ENGINEERING: A Bridge To Design and Construction, Requirements Engineering Tasks, Initiating the Requirements Engineering Process, Eliciting Requirements, Developing Use-cases, Building the Analysis Model, Negotiating Requirements, Validating Requirements.

BUILDING THE ANALYSIS MODEL: Requirements Analysis, Analysis Modeling Approaches, Data Modeling Concepts, Flow-Oriented Modeling, Class Based Modeling Creating a Behavioral Model.

UNIT – III **(12 Periods)**

DESIGN ENGINEERING: Design within the Context of Software Engineering, Design Process and Design Quality, Design Concepts The Design Model, Pattern Based Software Design.

CREATING AN ARCHITECTURAL DESIGN: Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design, Assessing Alternative Architectural Designs.

MODELING COMPONENT-LEVEL DESIGN: What Is a Component? , Designing Class-Based Components, Conducting Component-Level Design, Designing Conventional Components.

PERFORMING USER INTERFACE DESIGN: The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

UNIT – IV **(13 Periods)**

SOFTWARE PROCESS AND PROJECT METRICS: Introduction: Metrics Process and Project Domains, Software Measurement, Metrics for Software Quality, Integrating Metrics with Process.

SOFTWARE QUALITY ASSURANCE: Quality Concepts, Quality Movement, SQA, Software Reviews, Formal Technical Reviews, Formal Approaches to SQA, Software Reliability, ISO 9000 Quality Standards, SQA Plan.

SOFTWARE TESTING STRATEGIES: Strategic Approach, Strategic Issues, Test strategies for Conventional Software, Test strategies for Object Oriented Software, Validation Testing, System Testing, The Art of Debugging.

TESTING TACTICS: Software Testing Fundamentals, Black-Box and White-Box Testing, White Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing, Object-Oriented Testing Methods.

PRODUCT METRICS: Software Quality, A Framework for Product Metrics, Metrics for the Analysis Model, Metrics for the Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.

TEXT BOOK:

1. Roger S.Pressman, “Software Engineering- A Practitioner's Approach”, Sixth Edition, McGraw- Hill International.

REFERENCE BOOKS:

1. Ian Sommerville, “Software Engineering”, Sixth Edition, Pearson Education.
2. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, “Fundamentals of Software Engineering”, Second Edition, PHI.
3. RajibMall, “Fundamentals of Software Engineering”, Second Edition, PHI.

AUTOMATA THEORY & FORMAL LANGUAGES

III B.Tech – V Semester (Code: 14CS502)

Lectures	:	4 Periods/Week, Self Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 Periods)**

Automata: Introduction to Automata, The central concepts of automata theory - Alphabets, Strings, Languages.

Finite Automata: An Informal picture of finite automata, Deterministic finite automata (DFA) - Definition of DFA, DFA processing strings, Notations for DFA, Extended transition function, the language of DFA, Non deterministic finite automata (NFA) – Definition of NFA, Extended transition function, the language of NFA, Equivalence of DFA and NFA Finite

Automata with ∈ transitions: Use of ∈ - transition, notation for an ∈ - NFA, Epsilon closures, extended transitions and languages, Applications.

UNIT – II **(14 Periods)**

Regular Expressions and Languages: Regular expressions, finite automata and regular expressions, Algebraic laws of regular expressions.

Properties of Regular Languages: Proving languages are not regular – Pumping lemma for regular languages, Applications of the pumping lemma, Closure Properties of Regular Languages, Equivalence and minimization of automata – Minimization of DFA.

UNIT – III **(16 Periods)**

(Construction based treatment & proofs are excluded)

Context Free Grammars: Context Free Grammars, Parse Trees, Constructing parse trees, derivations and parse trees, ambiguous grammars.

Pushdown Automata: Definition of the Pushdown automata, the languages of PDA, Equivalences of PDA's and CFG's.

Context free languages: Normal form's for context- Free grammars, the pumping lemma for context free languages.

UNIT – IV **(14 Periods)**

Properties of Context free languages: closure properties for context free languages, Decision properties for CFL's.

Introduction to Turing Machines: The Turing Machine, programming techniques for Turing machines.

Undecidability: a language that is not recursively enumerable, an undecidable problem that is RE, Undecidability problems about TM, Post's Correspondence problem.

TEXTBOOK:

1. John.E.Hopcroft, R.Motwani, &Jeffery.D Ullman, “Introduction to Automata Theory Languages and Computations”, Second Edition, Pearson Education, 2003.

REFERENCE BOOKS:

1. Cohen, “Computer Theory”, KLP Mishra &N.Chandrasekharan, “Theory of Computation”, PHI.
2. H.R.Lewis, C.H.Papadimitriou, “Elements of The theory of Computation”, Second Edition, Pearson Education, 2003.
3. J.Martin, “Introduction to Languages and the Theory of Computation”, Third Edition, Tata McGraw Hill, 2003.
4. MichealSipser, “Introduction of the Theory and Computation”, Thomson Brokecole, 1997.
5. Ragade, “Automata and Theoretical Computer Science”, First Edition, Pearson Education, 2004.
6. John E Hopcroft& Jeffery D Ullman, “Introduction to Automata Theory & Languages and Computation”, Narosa Publishing House.

MICROPROCESSORS AND MICROCONTROLLERS

III B.Tech – V Semester (Code: 14CS503)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT- I (13 Periods)

The 8086 Microprocessor Family, the 8086 Internal Architecture: Introduction to Programming the 8086.8086 Family Assembly Language Programming, Implementing standard Program Structures in 8086 Assembly language, Strings ,Procedures and Macros.

UNIT – II (13 Periods)

8086 System Connections, Timing: The Basic8086 Microcomputer System, 8086 Bus activities during the Read and Write Machine Cycles, 8086 pin Diagram; 8086 Interrupts and Interrupt Applications: 8086 Interrupts and Interrupts Responses.

UNIT –III (12 Periods)

Interfacing Peripherals and Applications: Interfacing the Microprocessor to the Keyboard, Alphanumeric displays; 8259 Priority Interrupt Controller, 8237 DMA Controller. The 8051 Microcontrollers – Assembly language Programming- JUMP, LOOP, CALL instructions.

UNIT-IV (12 Periods)

MICRO CONTROLLERS: I/O port Programming- addressing Modes, Arithmetic, Logic, Single – bit instructions and Programming-Timer Counter programming in the 8051, Interrupts Programming.

TEXT BOOK:

1. Douglas V. Hall, “Microprocessors and Interfacing”, Tata McGraw-Hill, Revised Second Edition.
2. Muhammad Ali Mahadi and Janice Gillespie Mazidi, “The 8051 Microcontroller and Embedded Systems”, Pearson Education 2004.

REFERENCE BOOKS:

1. Yu-cheng Liu, Glenn A. Gibson, “Microcomputer systems: The 8086 /8088 Family architecture, Programming and Design”, Second edition, Prentice Hall of India, 2003.
2. Barry B. Brey, “The Intel Microprocessors, 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, PentiumPro Processor, PentiumII, PentiumIII, PentiumIV, Architecture, Programming & Interfacing”, Sixth Edition, Pearson Education Prentice Hall of India, 2002.

DATABASE MANAGEMENT SYSTEMS
III B.Tech – V Semester (Code: 14CS504)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 Periods)**

Databases and Database Users: Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications - When Not to Use a DBMS

Database System Concepts and Architecture : Data Models, Schemas, and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems

Data Modeling Using the Entity-Relationship (ER) Model : Using High-Level Conceptual Data Models for Database Design - An Example Database Application - Entity Types, Entity Sets, Attributes, and Keys - Relationship Types, Relationship Sets, Roles, and Structural Constraints - Weak Entity Types - Refining the ER Design for the COMPANY Database - ER Diagrams, Naming Conventions, and Design Issues

UNIT – II **(15 Periods)**

The Relational Algebra and Relational Calculus : Unary Relational Operations: SELECT and PROJECT - Relational Algebra Operations from Set Theory - Binary Relational Operations: JOIN and DIVISION - Additional Relational Operations - The Tuple Relational Calculus - The Domain Relational Calculus

SQL-99: Schema Definition, Constraints, Queries, and Views : SQL Data Definition and Data Types - Specifying Constraints in SQL - Schema Change Statements in SQL - Basic Queries in SQL - More Complex SQL Queries - INSERT, DELETE, and UPDATE Statements in SQL - Views (Virtual Tables) in SQL

UNIT – III **(15 Periods)**

Disk Storage, Basic File Structures: Introduction - Secondary Storage Devices - Buffering of Blocks - Placing File Records on Disk - Operations on Files - Files of Unordered Records (Heap Files) - Files of Ordered Records (Sorted Files) - Types of Single-Level Ordered Indexes Multilevel Indexes - Dynamic Multilevel Indexes Using B-Trees and B+-Trees - Indexes on Multiple Keys

Functional Dependencies and Normalization for Relational Databases : Informal Design Guidelines for Relation Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form

Relational Database Design Algorithms and Further Dependencies: Properties of Relational Decompositions - Algorithms for Relational Database Schema Design - Multi-valued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form.

UNIT – IV **(14 Periods)**

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing - Transaction and System Concepts - Desirable Properties of Transactions - Characterizing Schedules Based on Recoverability - Characterizing Schedules Based on Serializability

Concurrency Control Techniques: Two-Phase Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering – Multi version Concurrency Control Techniques - Validation (Optimistic) Concurrency Control Techniques - Granularity of Data Items and Multiple Granularity Locking

Database Recovery Techniques: Recovery Concepts - Recovery Techniques Based on Deferred Update - Recovery Techniques Based on Immediate Update - Shadow Paging

TEXT BOOKS:

1. Fundamentals of Database Systems, Ramez Elmasri and Navate Pearson Education, 5th edition.

REFERENCES:

1. Introduction to Database Systems, C.J.Date Pearson Education
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
3. Data base System Concepts, Silberschatz, Korth, McGraw hill, 5th edition.

ENTERPRISE PROGRAMMING-I

III B.Tech – V Semester (Code: 14CS505)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT-I **(16 Periods)**

The .NET Framework
Visual Studio
Web Form Fundamentals
Web Controls
Error Handling, Logging, and Tracing
State Management

UNIT – II **(15 Periods)**

Validation
Rich Controls
User Controls and Graphics
Styles, Themes, and Master Pages
Website Navigation

UNIT-III **(15 Periods)**

ADO.NET Fundamentals
Data Binding
The Data Controls
Files and Streams
XML
LINQ and the Entity Framework

UNIT-IV **(14 Periods)**

Deploying ASP.NET Applications
Working with Services
Putting ASP.NET MVC in Context
Your First MVC Application

TEXT BOOKS:

1. "Beginning ASP.NET 4.5 in C#", Matthew MacDonald,Apress Publishing Company.
2. "Professional ASP.NET 4.5 in C# and VB", Jason N. Gaylord, Christian Wenz, Pranav Rastogi, Todd Miranda, Scott Hanselman, John Wiley & Sons, Inc., Indianapolis, Indiana.
3. "Pro ASP.NET MVC 5", Adam Freeman, Apress Publishing Company.

REFERENCE BOOKS:

1. "Microsoft Windows Communication Foundation Step by Step", john sharp, Microsoft Press.

ARTIFICIAL INTELLIGENCE
ELECTIVE-I
III B.Tech – V Semester (Code: 14CS506/A)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT-I **(14 Periods)**

PROBLEMS, PROBLEM SPACES AND SEARCH

Defining the Problem as a State Space Search - Production Systems - Problem Characteristics - Production System Characteristics - Issues in the Design of Search Programs.

HEURISTIC SEARCH TECHNIQUES

Generate-and-Test - Hill Climbing - Best-First Search - Problem Reduction - Constraint Satisfaction - Means-Ends Analysis.

UNIT-II **(12 Periods)**

KNOWLEDGE REPRESENTATION USING PREDICATE LOGIC

Representing Simple Facts in Logic - Representing Instance and ISA Relationships - Computable Functions and Predicates - Resolution.

REPRESENTING KNOWLEDGE USING RULES

Procedural versus Declarative Knowledge - Logic Programming - Forward Versus Backward Reasoning – Matching - Control Knowledge.

UNIT-III **(12 Periods)**

SLOT – AND – FILLER STRUCTURES

Semantic Nets - Conceptual Dependency – Scripts.

PLANNING

Overview - An Example Domain: The Blocks Word - Component of Planning Systems - Goal Stack Planning - Non-linear Planning using constraint posting – Hierarchical planning – Reactive systems.

UNIT-IV **(12 Periods)**

LEARNING

What is learning? – Rote learning - Learning by taking advice – Learning in problem solving – Learning from example: Induction – Explanation Based Learning.

EXPERT SYSTEMS

Representing and using domain knowledge – Expert system shells – Explanation – Knowledge Acquisition.

Textbooks:

1. Elaine Rich & Kevin Knight, 'Artificial Intelligence', 2nd Edition, (Tata McGraw Hill Edition)

Reference Books:

1. Patrick Henry Winston, 'Artificial Intelligence', Pearson Education,
2. Russel and Norvig, 'Artificial Intelligence', Pearson Education/ PHI

PRINCIPLES OF PROGRAMMING LANGUAGES

ELECTIVE-I

III B.Tech – V Semester (Code: 14CS506/B)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Preliminaries: Reasons, Programming Domains, Language: Evolution Criteria, Categories, Design Trade-offs, Implementation, Programming Environments,

Evolution of Programming Languages.

Describing syntax and Semantics: General Problems, Describing Syntax, Recursive Descent Parsing, Attribute Grammar, Dynamic Semantics.

Primitive data types and variables: Names, variables, Concept of Binding, Type checking, Strong typing, Type compatibility, Named Constants, Variable Initialization.

UNIT – II **(13 Periods)**

Scope and Extent: Scope, Scope and Life Time, Referencing Environments.

Data Types: Primitive, character string, User-defined, Array, Associative Arrays, Record, Union, Set, Pointer.

Expression and the Assignment Statement: Arithmetic Expressions, Overloading, Type Conventions, Relational and Boolean, Short Circuit, Assignment, Mixed mode Assignment.

Statement level Control Structures: Compound, Selection, Iterative Statements, Unconditional Branching, Guarded Commands.

UNIT – III **(12 Periods)**

Subprograms: Fundamentals, Design Issue, Local Referencing Environment, Parameter Passing, Parameters that are sub-program names, Overloaded Sub-programs, Generic, Separate and Independent Compilation, Design Issues for functions, Non-local environments, User Defined Overloaded Operators, Co routines.

Implementing Subprograms: Fortran 77, Algol-like languages, Blocks, Dynamic Scoping, Implementing Parameters that are sub-program names.

Data Abstraction: Concepts, Encapsulation, Data, Introduction, Design Issues, Examples, Parameterized Abstract Data Types.

UNIT – IV **(12 Periods)**

Symmetric and Concurrent Subprograms: Support for Object Oriented Programming, Design Issues, Smalltalk, Support for Object Oriented Programming in; C++, Java, ADA 95, Implementation

Concurrency: Sub-program level, Semaphores, Monitors, Message Passing, and Concurrencyin ADA 95, Java Threads, and Statement level concurrency.

Exception handling: Introduction, Exception Handling in: PL1, ADA, C++, Java.

TEXT BOOK:

1. Robert W.Sebesta, 'Concepts of Programming Languages', Addison Wesley Longman Inc.,199.

REFERENCE BOOKS:

1. Ellis Horowitz, 'Fundamentals of Programming Languages', Galgotia Publications (P) Ltd., 1994.
2. Pratt Terrence.W, 'Programming Languages, Design & Implemented' Prentice Hall of India, 1993.

MACHINE LEARNING
ELECTIVE-I
III B.Tech – V Semester (Code: 14CS506/C)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Introduction to machine learning

Concept Learning and the General to Specific Ordering: Concept learning task, concept learning as search, Find-S: finding a Maximally Specific hypothesis, Version Spaces and the Candidate-Elimination algorithm, remarks on Version Spaces and Candidate-Elimination and inductive bias.

Decision Tree Learning: Decision Tree representation, appropriate problems for Decision Tree learning, hypothesis space search in Decision Tree learning, inductive bias in Decision Tree learning and issues in Decision Tree learning.

UNIT – II **(12 Periods)**

Artificial Neural Networks: Neural Network representations, appropriate problems for Neural Network learning, Perceptrons, Multilayer Networks and the Back propagation algorithm and remarks on the Back propagation algorithm.

Evaluating Hypotheses: Estimating hypothesis accuracy, basics of sampling theory, general approach for deriving confidence intervals, difference in error of two hypotheses and comparing learning algorithms.

UNIT – III **(13 Periods)**

Bayesian Learning: Bayes theorem and concept learning, maximum likelihood and least squared error hypotheses, maximum likelihood hypotheses for predicting probabilities, minimum description length principle, Bayes optimal classier, Gibbs algorithm, Naive Bayes classier, Bayesian belief networks and EM algorithm.

Computational learning theory: Introduction, probably learning an approximately correct hypothesis, sample complexity for finite hypothesis spaces, and sample complexity for infinite hypothesis spaces and mistake bound model of learning.

UNIT – IV **(12 Periods)**

Instance Based Learning: Introduction, k-Nearest Neighbor learning, locally weighted regression, radial basis functions, Case Based Reasoning and remarks on Lazy and Eager learning.

Genetic Algorithms: Introduction, hypothesis space search, Genetic programming and models of evolution and learning.

TEXT BOOK:

1. Tom M. Mitchell, “Machine Learning”, Mc. Graw Hill Publishing.

GRAPH THEORY

ELECTIVE-I

III B.Tech – V Semester (Code: 14CS506/D)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT-I **(13 Periods)**

Graphs, Sub graphs, some basic properties, various example of graphs & their sub graphs, walks, path & circuits, connected graphs, disconnected graphs and component, euler graphs, various operation on graphs, Hamiltonian paths and circuits, the traveling sales man problem.

UNIT-II **(13 Periods)**

Trees and fundamental circuits, distance diameters, radius and pendent vertices, rooted and binary trees, on counting trees, spanning trees, fundamental circuits, finding all spanning trees of a graph and a weighted graph, algorithms of primes, Kruskal and Dijkstra Algorithms.

UNIT-III **(12 Periods)**

Cuts sets and cut vertices, some properties, all cut sets in a graph, fundamental circuits and cut sets , connectivity and separability, network flows, Planer graphs, combinatorial and geometric dual: Kuratowski graphs, detection of planarity, geometric dual, Discussion on criterion of planarity, thickness and crossings.

UNIT-IV **(12 Periods)**

Vector space of a graph and vectors, basis vector, cut set vector, circuit vector, circuit and cut set subspaces, Matrix representation of graph – Basic concepts; Incidence matrix, Circuit matrix, Path matrix, Cut-set matrix and Adjacency matrix. Coloring, covering and partitioning of a graph, chromatic number, chromatic partitioning, chromatic polynomials, matching, covering, four color problem Discussion of Graph theoretic algorithm wherever required.

TEXT BOOK:

1. DeoNarsingh, Graph theory with applications to Engineering and Computer Science, PHI

REFERENCE BOOKS:

1. Gary Chartrand and Ping Zhang, Introduction to Graph Theory, TMH
2. Robin J. Wilson, Introduction to Graph Theory, Pearson Education
3. Harary, F, Graph Theory, Narosa
4. Bondy and Murthy: Graph theory and application. Addison Wesley.
5. V. Balakrishnan, Schaum's Outline of Graph Theory, TMH
6. GeirAgnarsson, Graph Theory: Modeling, Applications and Algorithms, Pearson Education

MICROPROCESSORS AND MICROCONTROLLER LAB

III B.Tech – V Semester (Code: 14CSL501)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Write a 8086 assembly language program to arrange the given numbers in ascending order.
2. Write a 8086 assembly language program to count number of +ve elements, -ve elements, zeros in the given array.
3. Write a 8086 assembly language program to find the square of a number using look-up-table.
4. Write a 8086 assembly language program to move a sting byte from a memory location to another memory location.
5. Write a 8086 assembly language program to calculate the maximum and minimum in an array.
6. Write a 8086 assembly language program to convert BCD to binary using near procedures.
7. Write a 8086 assembly language program to demonstrate passing parameters to procedures through registers.
8. Write a assembly language program to move a string from one location to another location using macros.
9. Write a8086 assembly language program to calculate nCr by using near procedures.
10. Assume that 5 BCD data items are stored in RAM locations starting at 40H. Write a program to find the sum of all the numbers. The result must be in BCD.
11. Write a program with three sub-routine to transfer the data from on-chip ROM to RAM location starting at 40H b)add them and save in 60Hc)find the average of the data and store it in R7.notice that data is stored in a code space of on-chip ROM.
12. Program the 8051 timers to generate time delay.

RDBMS LABORATORY USING: ORACLE 9i

III B.Tech – V Semester (Code: 14CSL502)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

I.Commands in SQL.

i. Creating objects: tables, views, users, sequences, Collections etc.
ii. Privilege management through the Grant/Revoke commands
iii. Transaction processing using Commit/Rollback
iv. Save points.

II.Simple queries: selection, projection, sorting on a simple table

i. Small-large number of attributes
ii. Distinct output values
iii. Renaming attributes
iv. Computed attributes
v. Simple-complex conditions (AND, OR, NOT)
vi. Partial Matching operators (LIKE, %, _, *, ?)
vii. ASC-DESC ordering combinations
viii. Checking for Nulls

III.Nested queries

i. In, Not In
ii. Exists, Not Exists
iii. Dynamic relations (as part of SELECT, FROM, and WHERE clauses)

IV.Set Oriented Operations

i. Union
ii. Difference
iii. Intersection
iv. Division

V.Multi-table queries(JOIN OPERATIONS)

i. Simple joins (no INNER JOIN)
ii. Aliasing tables – Full/Partial name qualification
iii. Inner-joins (two and more (different) tables)
iv. Inner-recursive-joins (joining to itself)
v. Outer-joins (restrictions as part of the WHERE and ON clauses)
vi. Using where & having clauses

VI.User Defined Types

i. Creating Objects
ii. Creating User Defined Operators

VII.PL/SQL Programming I

i. Programs using named and unnamed blocks
ii. Programs using Cursors, Cursor loops and records

VIII.PL/SQL Programming II

i. Creating stored procedures, functions and packages
ii. Error handling and Exception
iii. Triggers and auditing triggers

TEXT BOOKS:

1. Oracle Database 10g The Complete Reference by Kevin Loney, Tata McGraw-Hill Publishing Company Limited.
2. Oracle 9i PL/SQL Programming by Scott Urman, Tata McGraw-Hill Publishing Company Limited.
3. Simplified Approach to Oracle by Parteek Bhatia, Sanjiv Datta, Ranjit Singh, Kalyani Publishers.

Enterprise Programming-I Lab
III B.Tech – V Semester (Code: 14CSL503)

Lectures	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Design an ASP.NET application to demonstrate Web Form markup and redirection.
2. Design an ASP.NET application to demonstrate Web Controls.
3. Design an ASP.NET application to demonstrate View State to transfer data between Web Pages.
4. Design an ASP.NET application to demonstrate the use of Cookies.
5. Design an ASP.NET application to demonstrate Session State to transfer data between Web Pages.
6. Design an ASP.NET application to demonstrate Validating ASP.NET Web Pages using Validation Controls.
7. Design an ASP.NET application to demonstrate User Controls.
8. Design an ASP.NET Web Site with Styles, Themes and Master Pages.
9. Design an ASP.NET application to work with SQL Server Database using ADO.NET and Data Controls.
10. Design an ASP.NET application to work with SQL Server Database using LINQ Queries.
11. Design an application to demonstrate a Web Service Creation and Consumption.
12. Design a Simple MVC Web Pages Application.

Introduction to Data Analytics
III B.Tech – VI Semester (Code: 14CS601)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Introduction to R - Why use R? Obtaining and installing R.

The R Environment - Command line interface, RStudio.

R Packages - Installing packages, loading packages, Building packages.

Basics of R - basic Math, variables, Data types, vectors, calling function, function documentation, missing data.

Advanced Data Structures - data. Frames, Lists, Matrices, Arrays.

Reading Data into R - Reading CSVs, Excel data, reading from databases.

UNIT – II **(12 Periods)**

Basic Data Management- A working example, creating new variables, recoding variables, renaming variables, missing values, date values, type conversion, sorting data, merging data set, Subsetting datasets, Using SQL statement to manipulate data.

Advanced Data Management- A data management challenge, Numerical and character functions, a solution for data management challenge, control flow, User Written functions, Aggregate and reshaping.

Basic graphs- Bar plot, pie chart, Histograms, Kernel Density plots, Box plots, dot plots

UNIT-III **(13 Periods)**

Probability Distribution - Normal distribution, binomial distribution

Basic statistics - summary statistics, correlation and covariance, T-test, ANOVA

Manipulating Strings- paste, sprintf, extracting text, regular expression.

Linear Models: Simple linear regression, multiple linear regressions.

UNIT – IV **(12 Periods)**

Cluster Analysis: Cluster Analysis-common steps in cluster analysis, calculating distances, Hierarchical cluster analysis, Partitioning cluster analysis, avoiding nonexistence clusters.

Classifications - Preparing the data, logistic regression, decision trees, random forests, support vector machines, choosing a best predictive solution.

Text Book:

1. R for Every One ,Advanced analytics and graphics by Jared P Lander, Addison Wisley Data and analytics series. (UNIT-I, III)
2. R in Action, Data Analysis and graphics with R,Robert L Kabacoff, Manning Publisher (UNIT-II, IV)

References:

1. Beginning R by Dr. Mark Gardener, Wrox publisher.
2. Associate Analytics Facilitator Guide provided by NASSCOM. http://183.82.43.252/~gopam/html/NASSCOM

COMPILER DESIGN

III B.Tech – VI Semester (Code: 14CS602)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Introduction to compiling: Compilers, The Phases of a compiler.

Simple one-pass compiler: Overview, syntax definition, syntax direct translation, parsing, a translator for simple expressions.

Lexical Analysis: The role of the lexical analyzer, input buffering, simplification of tokens, Recognition of tokens, implementing transition diagrams, a language for specifying lexical analyzers.

Syntax analysis: Top down parsing - Recursive descent parsing, Predictive parsers.

UNIT – II **(13 Periods)**

Syntax Analysis: Bottom up parsing - Shift Reduce parsing, LR Parsers – Construction of SLR, Canonical LR and LALR parsing techniques, Parser generators – Yacc Tool.

Syntax – Directed Translation: Syntax Directed definition, construction of syntax trees, Bottom-up evaluation of S – attributed definitions.

UNIT – III **(12 Periods)**

Runtime Environment: Source language issues, Storage organization, Storage-allocation strategies, Access to nonlocal names, Parameter passing..

Symbol Tables: Symbol table entries, Data structures to symbol tables, representing scope information.

UNIT – VI **(12 Periods)**

Intermediate code Generation: Intermediate languages, Declarations, Assignment statements, Boolean expressions, Back patching.

Code Generation- Issues in the design of code generator, the target machines, Basic blocks and flow graphs, Next use information, A simple code generator

TEXT BOOK:

1. Alfred V.Aho, RaviSethi, JD Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education, 2007.

REFERENCE BOOKS:

1. lfred V.Aho, Jeffrey D. Ullman, “Principles of Compiler Design”, Narosa publishing.
2. Lex&Yacc”, John R. Levine, Tony Mason, Doug Brown, O’reilly.
3. Modern Compiler Implementation in C”, Andrew N. Appel, CambridgeUniversity Press.
4. “Engineering a Compiler”, Cooper & Linda, Elsevier.
5. Compiler Construction”, Louden, Thomson.

COMPUTER NETWORKS

III B.Tech – VI Semester (Code: 14CS603)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I (14 Periods)

Data Communications & Networking Overview: A Communications Model, Data Communications, Data Communication Networking.

Protocol Architecture: The Need for a Protocol Architecture, A Simple Protocol Architecture, OSI, The TCP/IP Protocol Architecture.

Digital Data Communication Techniques: Asynchronous & Synchronous Transmission, Types of Errors, Error Detection, Error Correction

Data Link Control: Flow Control, Error Control, High-Level Data link Control (HDLC)..

UNIT – II (16 Periods)

Network Layer: **Network Layer Design Issues**: Store-and-Forward Packet Switching, Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of Connection-Oriented Service, Comparison of Virtual-Circuit & Datagram Subnets.

Routing Algorithms: The Optimality Principle, Shortest Path, Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing

Congestion Control Algorithms: General Principles of Congestion Control, Congestion Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets, Load Shedding, Jitter Control.

Quality of Service: Requirements, Techniques for Achieving Good Quality of Service

The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols.

UNIT – III (15 Periods)

The Transport Layer: **The Transport Service**: Services Provided to the Upper Layers, Transport Service Primitives, Berkeley sockets

Elements of Transport Protocols: Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery,

The Internet Transport Protocol (UDP): Introduction to UDP, Remote Procedure Call, The Real-Time Transport Protocol.

The Internet Transport Protocols (TCP): Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modeling TCP Connection Management, TCP Transmission Policy, TCP Congestion Control, TCP Timer Management.

UNIT – IV (15 Periods)

Application Layer: **The Domain Name System(DNS):** The DNS Name Space, Resource Records, Name Servers. **Electronic Mail**: Architecture & Services, The User Agent, Message Formats, Message Transfer, Final Delivery.

The World Wide Web: Architectural Overview, Static Web Documents, Dynamic Web Documents, HTTP – Hyper Text Transfer Protocol, Performance Enhancements.

TEXT BOOK:

1. Behrouz A.Forouzan, “Data Communications and Networking”, 4th edition, TMH.
2. Tanenbaum, “Computer Networks”, 4th Edition, (Pearson Education / PHI).

REFERENCE BOOKS:

1. Wayne Tomasi, “Introduction to Data Communications and Networking”, PHI.
2. BehrouzA.Forouzan, “Data Communications and Networking”, Fourth edition, TMH.
3. GodBole, “Data Communications & Networking”, TMH.
4. Kurose & Ross, “COMPUTER NETWORKS– A Top-down approach featuring the Internet”, Pearson Education, Alberto Leon, Garciak.
5. LeonGartia, IndraWidjaja, “Communication Networks Fundamental Concepts and Key
Architectures”, TMH.
6. Nader F.Mir, “Computer and Communication Networks”, PHI.

ENTERPRISE PROGRAMMING-II

III B.Tech – VI Semester (Code: 14CS604)

Lectures	:	4 periods/week,Tutorial:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 periods)**

The Big Picture: Java EE Architecture, Hello Java EE - Running Hello Java EE, The Many Variations of Java EE Applications, Packaging and Deploying the Hello Java EE Application, Java EE Platform and Implementations.

Classic Memories: JDBC - Introduction to JDBC, Hello JDBC Example, Structured Query Language, The JDBC APIs.

Java Servlets and Web Applications: Foundations of the Web Tier: The HTTP Protocol, Introducing Java Servlets, Understanding the Java Servlet API, Web Applications, Java Servlets: The Good and the Bad.

UNIT – II **(15 periods)**

Dynamic Web Pages: JSP - JSP Runtime Architecture, A JSP Clock, JSP Syntax, the Java Environment for JSPs, JSP Standard Tags, Custom Tag Libraries, Expression Language.

Assembling Dynamic Web Pages: Java Server Faces - Architecture of a JSF Application, Java Server Faces Tags, and Java EE Managed Beans, f: Core Tags, JSTL Core Tags, Extensibility and Modularity.

UNIT – III **(15periods)**

Web Sites for Non-browsers: JAX-RS - What Are RESTful Web Services, The Java API for RESTful Web Services, HelloResource Example: Server Side, Deploying JAX-RS Resources, HelloResource Example and the Rich Client, Content Production, Content Consumption, Accessing Web Service Context, Exception Mapping, Number of Instances of Resource Classes, Path Mapping.

Adding Sparkle: Java Web Sockets - Introduction to the Web Socket Protocol, the Web Socket Lifecycle, Overview of the Java Web Socket API, Web Socket Clock, Java Web Socket Encoders and Decoders, Message Processing Modes, Path Mapping, Deployment of Server Endpoints.

UNIT – IV **(14 periods)**

The Fundamentals of Enterprise Beans: Introduction to Enterprise Beans, Hello Enterprise Beans, Flavors of Enterprise Beans, Exposing Enterprise Beans, Finding Enterprise Beans, EJB Lifecycle, Packaging Enterprise.

Advanced Thinking with Enterprise Beans: Multi-threading and Enterprise Beans, Asynchronous Enterprise Beans, Enterprise Bean Contexts, the Timer Service, Transactions and Enterprise Beans, Interceptors.

Modern Memories: The Java Persistence API - The Library Service, with Java Persistence, Persistence Entities, The Entity Manager, Java Persistence Query Language, Configuring JPA Applications.

TEXT BOOK:

2. Dr. Danny Coward, **"Java EE 7: The Big Picture",** oracle press.

REFERENCE BOOKS:

1. Arun Gupta "**Java EE 7 Essentials**" O'Reilly.
2. Antonio Goncalves "Beginning Java EE 7 " apress.

NATURAL LANGUAGE PROCESSING

ELECTIVE - II

III B.Tech – VI Semester (Code: 14CS606/A)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT – I **(12 Periods)**

Introduction to Natural Language Understanding, Syntactic Processing: Grammars and Parsing.

UNIT – II **(13 Periods)**

Features and Augmented Grammars, Toward Efficient Parsing, Ambiguity Resolution: Statistical Methods: Probabilistic Context-Free Grammars, Best-First Parsing.

UNIT – III **(12 Periods)**

Semantic Interpretation: Linking Syntax and Semantics, Ambiguity Resolution, other Strategies for Semantic Interpretation.

UNIT – IV **(13 Periods)**

Context and World Knowledge: Using World Knowledge, Discourse Structure, Defining a Conversational Agent.

TEXT BOOK:

1. Natural Language Understanding – James Allen, Second Edition, Pearson Education.

REFERENCE BOOKS:

1. Speech and Language Processing – Daniel Jurafsky, James H.Martin.
2. Foundations of Statistical Natural Language Processing – Christopher Manning, Hinrich Schutze, MIT Press.
3. Artificial Intelligence, Elaine Rich and Kevin Knight, Second Edition, Tata McGraw Hill.

PARALLEL PROCESSING
ELECTIVE - II
III B.Tech – VI Semester (Code: 14CS606/B)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT – I **(13 Periods)**

Introduction: Parallel Processing Architecture: Parallelism in sequential machines, Abstract model of parallel computer, Multiprocessor Architecture, Pipelining, Array Processors.

Programmability Issues: An overview, Operating System Support, Types of operating Systems, Parallel Programming Model, Software Tools.

Data Dependency Analysis: Types of Dependencies, Loop and Array Dependencies, Loop Dependency Analysis, Solving Diophantine equations, Program Transformations.

UNIT – II **(12 Periods)**

Shared Memory Programming: General model of shared memory programming, Process model under UNIX.

Algorithms for Parallel Machines: Speed-up, Complexity and Cost, Histogram Computation, Parallel Reduction, Quadrature Problem, Matrix Multiplication, Parallel Sorting Algorithms, Solving Linear Systems, Probabilistic Algorithms.

Message Passing Programming: Introduction, Model, Interface, Circuit Satisifiability, Introducing Collective, Benchmarking Parallel Performance.

UNIT – III **(13 Periods)**

Parallel Programming Languages: Fortran90, nCUBE C, Occam, n-Linda.

Debugging Parallel Programs: Debugging Techniques, Debugging Message Passing Parallel Programs, Debugging Shared Memory Parallel Programs.

Memory and I/O Subsystems: Hierarchical Memory Structure, Virtual Memory System, Memory Allocation and Management, Cache Allocation and Management, Cache Memories and Management, Input Output Systems.

UNIT – IV **(12 Periods)**

Other Parallelism Paradigms: Dataflow Computing, Systolic Architectures, Functional and Logic Paradigms, Distributed Shared Memory.

Performance of Parallel Processors: Speed-up and Efficiency, Amdahl's Law, Gustafson-Barsis.s Law, Karf-Flatt Matrix, Isoefficiency Matrix.

TEXT BOOK:

1. Hawang Kai and Briggs F.A, “Computer Architecture and Parallel Processing”, McGraw Hill.
2. Jordon H.F. and Alaghaband G., “Fundamentals of Parallel Processing”.
3.M.J. Quinn, “Parallel Processing”, TMH.

REFERENCE BOOKS:

1. Shasikumar M., “Introduction to Parallel Processing”, PHI.
2. Wilson G.V., “Practical Parallel Programming”, PHI.
3.Singh, A.Gupta, “Parallel Computer Architecture”, Morgan Kaufman.

DIGITAL IMAGE PROCESSING

ELECTIVE - II

III B.Tech – VI Semester (Code: 14CS606/C)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT – I (13 Periods)

INTRODUCTION: Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System.

DIGITAL IMAGE FUNDAMENTALS: Elements of Visual Perception, Image Sensing and Acquisition, Image Sampling and Quantization, Some basic Relationships between Pixels.

UNIT – II (12 Periods)

IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN: Some Basic Gray Level Transformation, Histogram Processing, Enhancement using Arithmetic/ Logic Operations, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.

IMAGE ENHANCEMENT IN THE FREQUENCY DOMAIN: Introduction to the Fourier Transform, and The Frequency Domain, Smoothing Frequency Domain Filters, Sharpening Frequency Domain Filters, Homomorphic Filtering, Implementation.

UNIT – III (13 Periods)

IMAGE RESTORATION: A Model of the Image Degradation/Restoration Process, Linear, Position –Invariant Degradations, Inverse Filtering, Minimum Mean Square Error(Wiener) Filtering, Constrained Least Squares Filtering.

WAVELETS AND MULTIRESOLUTION PROCESSING: Multiresolution Exapnsions, Wavelet Transforms in One Dimension, The Fast Wavelet Transform, Wavelet Transforms in Two-Dimesions.

UNIT – IV (12 Periods)

IMAGE COMPRESSION: Image Compression Models, Error Free Compression, Lossy Compression, Image Compression Standards.

IMAGE SEGMENTATION: Detection of Discontinuties, Edge Linking and Boundary Detection, Thresholding, Region Based Segmentation.

TEXT BOOK:

1. Rafael C. Gonzalez, Richard E. Woods, 'Digital Image Processing' Addison Wesley Pubs (Second Edition)

REFERENCE BOOKS:

1. Milan Sonka, Vaclav Hlavac, Roger Boyle Image Processing. Analysis, and Machine Vision (Second Edition).
2. A.K.Jain, 'Fundamentals of Digital Image Processing' PHI.
3. Philips, 'Image Processing in C', BPB Publications.

ADVANCED COMPUTER ARCHITECTURE
ELECTIVE - II
III B.Tech – VI Semester (Code: 14CS606/D)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT – I **(13 Periods)**

Parallel Computer Models: The state of computing, Classification of parallel computers, Multiprocessors and Multi computers, Multi vector and SIMD computers.

Program and network properties: Conditions of parallelism, Data and resource Dependences, Hardware and Software parallelism, Program partitioning and scheduling, Grain Size and latency, Program flow mechanisms, Control flow versus data flow, Data flow Architecture, Demand driven mechanisms, Comparisons of flow mechanisms.

System Interconnect Architectures: Network properties and routing, Static interconnection Networks, Dynamic interconnection Networks, Hierarchical bus systems, Crossbar switch and multi-port memory, Multistage and combining network.

UNIT – II **(13 Periods)**

Principles of Scalable Performance: Performance Metrics and Measures, Parallel Processing Applications. Speedup Performance Laws - Amdahl's law for fixed load, Gustafson's law for scaled problems, Memory Bounded Speedup Model.

Pipelining: Linear pipeline processor, nonlinear pipeline processor, Instruction pipeline Design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch Handling techniques, branch prediction, Arithmetic Pipeline Design, Computer Arithmetic principles, Static Arithmetic pipeline, Multifunctional arithmetic pipelines.

UNIT – III **(12 Periods)**

MULTI Processors: Multiprocessor System Interconnect, Cache Coherence and Synchronization Mechanisms, Message-passing Mechanism.

Scalable, Multi-Threaded and Dataflow Architectures: Latency-Hiding Techniques, Principles of Multithreading, Scalable and Multithreaded Architectures.

UNIT – IV **(12 Periods)**

Parallel Models, Languages and Compilers: Parallel Programming Models, Parallel Languages and Compilers, Dependence analysis of Data Arrays, code optimization and Scheduling, Loop parallelization and pipelining.

TEXT BOOK:

1. Kai Hwang, "Advanced Computer Architecture", TMH.

REFERENCE BOOKS:

1. D.A. Patterson and J.L.Hennessey, "Computer organization and Design", MorganKaufmann, 2nd Edition.
2. V.Rajaram&C.S.R.Murthy, "Parallel Computer", PHI.
3. Barry Wilkinson and Michael Allen, "Parallel Programming", Pearson Education.

INTRODUCTION TO DATA ANALYTICS LAB

III B.Tech – VI Semester (Code: 14CSL601)

Lectures	:	3 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

Data Analytics Lab Using R

1. a). Write R Code using R as a calculator.
   b). Write R Code on Vector Operation.
   c). Write R code which demonstrate i) Array ii) List iii) Matrix iv) stack v) Data Frames
2. Write R Code to Importing & Exporting data from i)CSV file ii)Excel file
3. Write R code Which Demonstrate i) Missing Value Treatment ii) Outliers
4. Write R code which demonstrate i) Missing Values ii) Date Values iii)Type Conversion
5. Write R code to demonstrate character functions
6. Write R code which demonstrate functions and control loops
7. Write R code which demonstrate SQL operations using R
8. Write R code which demonstrate plotting of graphs i) Histogram ii) Pie Graph iii) Plot Graph iv) Box Plot v) Dot Plot vi) Kernel Density Plots
9. Write R code which demonstrate statistics functions i) Mean ii) Median iii) Range iv) Variance v) Co variance
10. Write R Code which demonstrate i) Normal Distribution ii) Binomial Distribution
11. Write R code which demonstrates Linear Regression.
12. Write R code which demonstrate i) T-Test ii) ANOVA test
13. Write R code which demonstrates string operations
14. Write R code for cluster analysis on IRIS data set using i) Hierarchical Clustering ii) Partitioning Clustering (K-Means, K-medoids)
15. Write R code for classification on IRIS data set using i) Decision trees ii) Random Forest iii) Support vector machines

ENTERPRISE PROGRAMMING-II LAB
III B.Tech – VI Semester (Code: 14CSL602)

Lectures	:	3 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

LIST OF EXPERIMENTS

1. Write a JDBC application to implement DDL and DML commands.
2. Write an application to demonstrate HTTP Servlets.
3. Write an application to demonstrate cookie & Sessions.
4. Write an application to integrate JSP & Servlets.
5. Write an application to implement Photo Album using JSP.
6. Create a Photo application using JSF.
7. Write an application to demonstrate web service.
8. Write a chat application using Web sockets.
9. Write an application to demonstrate Session Bean and Entity Bean (persistence).
10. Write an application to demonstrate Asynchronous and Timer services of Enterprise Bean.

CLOUD AND MOBILE APPLICATION DEVELOPMENT LAB
III B.Tech – VI Semester (Code: 14CSL603)

Lectures	:	3 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

LIST OF EXPERIMENTS

1. Website development using Razor C#
2. Website Development using PHP.
3. Cloud Service to access Windows Azure Blob Storage.
4. Cloud Service to access Windows Azure Table Storage.
5. Cloud Service to access Windows Azure Queue Storage.
6. Windows Azure Virtual Machine Creation and configuring with SQL Server and J2EE Platform.
7. Cloud Service (or) C# Console Application to access Azure SQL.
8. SQL Server Database Migration.
9. C# Console Application to implement Service Bus Relayed Messaging.
10. C# Console Application to implement Service Bus Brokered Messaging using Queues.
11. C# Console Application to implement Service Bus Brokered Messaging using Topics.

Design the following Android Application:

1. Which demonstrating Layout Design
2. Which implementing animation
3. Which implementing Activities
4. Which Demonstrating Device independent User Interface.
5. To demonstrate Fragments
6. To demonstrate Compound Controls
7. To demonstrate Intents and Broadcast Receivers
8. To work with Internet Resources
9. To demonstrate saving application data.
10. To work with SQL Lite.

INTRODUCTION TO CYBER SECURITY
IV B.Tech – VII Semester (Code: 14CS701)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT-I **(13 periods)**

Information security management: Information Security Overview, Information Security Threats and Attack Vectors, Types of Attacks, Common Vulnerabilities and Exposures (CVE), Security Attacks, Computer Security Concerns, Information Security Measures.

Fundamentals of Information security: Key Elements of Network, Logical Elements of Network, Critical Information Characteristics, Information States,

UNIT-II **(13 periods)**

Information Security Performance Metrics: Introduction - Security Metrics, Characteristics of good metrics, Types of Security Metrics, Using Security Metrics
Case studies: NIST sample security metrics, Static Malware Analysis IoCs
Information Security Audit: Defining IT Audit, Risk Analysis, Internal Controls, Steps of an IT Audit, Preparing to be audited

Information Security Audit Case Studies: Firewall Security Auditing (iptables), IDS Security Auditing (snort), Social Engineering Auditing (setoolkit).

UNIT-III **(12 periods)**

Vulnerability Management: The problem, what is Vulnerability Management, challenges to effective VM, successful approaches
Management Case Studies: Vulnerability Scanning and Assessment (nessus), Nmap, Metasploit

UNIT-IV **(12 periods)**

Configuration Reviews: Configuration Management, Testing for Configuration Management, Identifying and implementing configurations
Configuration Reviews Case Studies: IDS snort, Firewalls- iptables, Windows System Security Configuration Review (MBSA).

REFERENCE BOOKS:

1. Security Analysis web resource:
url:https://jumpshare.com/v/CUOssnNkE6cW9YGcGz2p

OBJECT ORIENTED ANALYSIS AND DESIGN
IV B.Tech – VII Semester (Code: 14CS702)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT–I **(13 Periods)**

What is Object-Orientation: Basic Concepts, The Origins of Object Orientation, Object-Oriented Languages today;

Agate Ltd Case Study: Introduction to Agate Ltd.

Modeling Concepts: Models and diagrams, Drawing Activity Diagrams, A Development Process;

Requirements Capture: User Requirements, Fact Finding Techniques, User Involvement, Documenting Requirements, Use Cases, Requirements Capture and Modelling;

Agate Ltd Case study: Requirements Model.

Requirements Analysis: What Must a Requirements Model Do?, Use Case Realization, The Class Diagram, Drawing a Class Diagram, CRC Cards, Assembling the Analysis Class Diagram. **Agate Ltd Case study -** Requirements Analysis.

UNIT – II **(13 Periods)**

Refining the Requirements Model: Component based development, Adding further structure, Software development patterns.

Object Interaction: Object Interaction and Collaboration, Interaction Sequence Diagrams, Collaboration Diagrams, Model Consistency;

Specifying Operations: The Role of Operation Specifications, Contracts, Describing Operation Logic, Object Constraint Language, Creating an Operation Specification;

Specifying Control: States and Events, Basic Notation, Further Notation, Preparing a State chart, Consistency Checking, Qualify Guidelines;

Agate Ltd Case study - Further Analysis.

UNIT – III **(12 Periods)**

Moving Into Design: How is Design Different from Analysis?, Logical and Physical Design, System Design and Detailed Design, Qualities and objectives of Analysis and Design, Measurable Objectives in Design, Planning for Design.

System Design: The Major Elements of System Design, Software Architecture. Concurrency, Processor Allocation, Data Management Issues, Development Standards, Prioritizing Design Trade-offs, Design for Implementation;

Object Design: Class Specification, Interfaces, Criteria for Good Design, Designing Associations, Integrity Constraints, Designing Operations, Normalization;

Design Patterns: Software Development Patterns, Documenting Patterns-Pattern Templates, Design Patterns, How to Use Design Patterns, Benefits and Dangers of Using Patterns; **Human-Computer Interaction:** The User Interface, Approaches to User Interface Design, Standards and legal Requirements;

UNIT-IV **(12 Periods)**

Designing Boundary Classes: The Architecture of the Presentation Layer, Prototyping the User Interface, Designing Classes, Designing Interaction with Sequence Diagrams, The Class Diagram Revisited, User Interface Design Patterns, Modelling the Interface Using Statecharts;

Agate Ltd Case Study – Design.

Implementation: Software Implementation, Component Diagrams, Development Diagrams, Software Testing, Data Conversion, User Documentation and Training, Implementation Strategies, Review and Maintenance;

Reusable Components: Why Reuse?, Planning a Strategy for Reuse, Commercially Available componentware;

TEXT BOOK:

1. "Object-Oriented Systems Analysis And Design Using UML", Simon Bennett, Steve McRobb and Ray Farmer, Tata McGraw-Hill Edition, Second Edition.

REFERENCE BOOKS:

1. James Rumbaugh, Jacobson, Booch, "Unified Modeling Language Reference Manual", PHI.
2. Jacobson et al., "The Unified Software Development Process", AW, 1999.
3. AtulKahate, "Object Oriented Analysis &Design", The McGraw-Hill Companies, 2004.

ADVANCED DATA ANALYTICS
IV B.Tech – VII Semester (Code: 14CS703)

Lectures	:	4 Periods/week,Tutorial:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT-I **(16 Periods)**

Big Data Analytics: Introduction to Big Data Analytics, what and why analytics, Applications of modeling business, data modeling techniques overview.

Simple Hypothesis Testing :Using the Student's t-test ,Two-Sample t-Test with Unequal Variance , Two-Sample t-Test with Equal Variance ,One-Sample t-Testing ,Using Directional Hypotheses ,Formula Syntax and Subsetting Samples in the t-Test ,The Wilcoxon U-Test (Mann-Whitney) ,Two-Sample U-Test ,One-Sample U-Test ,Using Directional Hypotheses ,Formula Syntax and Subsetting Samples in the U-test, Paired t- and U-Tests, Correlation and Covariance ,Simple Correlation ,Covariance ,Significance Testing in Correlation Tests .

UNIT-II **(14 Periods)**

Machine Learning: Cluster Analysis-common steps in cluster analysis, calculating distances, Hierarchical cluster analysis, Partitioning cluster analysis, avoiding nonexistence clusters.
Classifications-preparing the data, logistic regression, decision trees, random forests, support vector machines, choosing a best predictive solution, using the rattle package for data mining.

UNIT-III **(16 Periods)**

The Hadoop Distributed File System-The design of HDFS,HDFS concepts, The command line interpreter , Basic File system operations, hadoop file system,interfacesData flow, parallel copying with distcp.
YARN-Anatomy of YARN application run, YARN compared to Map Reduce 1, Scheduling in YARN

UNIT-IV **(16 Periods)**

How Map Reduce Works-Anatomy of Map Reduce job run, Failures, Shuffle and sort, Task execution.
Map Reduce Features-Counters, sorting, joins side data distribution

Text Books:

1. Beginning R: The Statistical Programming Language, Dr.Mark Gardener (**6th Chapter**)(Unit-1)
2. R in Action by Robert I kabacoff, Manning Publisher (Chapter 16 & 17)(Unit-2)
3. Hadoop, The Definitive Guide, 4th Edition, O"Reilly Publisher(Unit-III & Unit-IV)

WIRELESS NETWORKS

IV B.Tech – VII Semester (Code: 14CS704)

Lectures	:	4 Periods/week,Tutorial:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 periods)**

Introduction: Applications, A short history of Wireless Communications, A market for Mobile Communications, A simplified reference model.

Wireless Transmission: Frequencies, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Spread Spectrum.

Medium Access Control: Motivation for a specialized MAC, SDMA, FDMA, TDMA, CDMA, Comparison.

UNIT – II **(12 periods)**

Telecommunication Systems: GSM, DECT, TETRA, UMTS and IMT-2000.

Satellite Systems – History, Applications, Basics (GEO, LEO, MEO), Routing, Localization, Handover.

Broadcast Systems: Over view, Cyclic repetition of data, Digital Audio Broadcasting, Digital Video Broadcasting.

UNIT – III **(13 periods)**

Wireless LAN: Infrared Vs. Radio transmission, Infrastructure and ad hoc networks, IEEE802.11: System Architecture, Protocol Architecture, Physical Layer, MAC Layer, MAC Management, Bluetooth: User Scenarios, Architecture, Protocol Stack.

Mobile Network Layer: Mobile IP, Dynamic host configuration, Ad hoc networks.

UNIT – IV **(12 periods)**

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit / fast recovery, Transmission / time-out freezing, Selective retransmission, Transaction oriented TCP.

Wireless Application Protocol: Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Wireless markup language, WML Script, Wireless telephony application, Example stacks with WAP.

TEXT BOOK:

1. J.Schiller, “Mobile communications”, Addison-Wesley, 2003

REFERENCE BOOKS:

1. William Stallings, “Wireless Communication Networks”, Pearson Education.
2. UWE Hansmann, LotherMerk, Martin S.Nicklous, Thomas Stober, “Principles of Mobile Computing”, 2nd Edition.

SOFTWARE PROJECT MANAGEMENT
ELECTIVE - III
IV B.Tech – VII Semester (Code: 14CS705/A)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT – I **(13 Periods)**

Conventional Software Management: The waterfall model, conventional software Management performance.

Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT – II **(12 Periods)**

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

Model based software architectures: A Management perspective and technical perspective.

Work Flows of the process: Software process workflows, Iteration workflows.

UNIT – III **(12 Periods)**

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning. Project

Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building blocks, The Project Environment.

UNIT – IV **(13 Periods)**

Project Control and Process instrumentation : The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process : Process discriminants.

Future Software Project Management : Modern Project Profiles, Next generation Software economics, modern process transitions.

111

Case Study: The command Center Processing and Display system- Replacement (CCPDS-R)

TEXT BOOK :

1. Software Project Management, Walker Royce: Pearson Education, 2005.

REFERENCES :

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education.200

DISTRIBUTED SYSTEMS
ELECTIVE - III
IV B.Tech – VII Semester (Code: 14CS705/B)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT – I **(13 Periods)**

Introduction: Definition of a Distributed System, Goals, Hardware Concepts, Software Concepts, the Client-Server Model.
Communication: Remote Procedure Call- Basic RPC Operation, Parameter Passing, Extended RPC Models, Remote Object Invocation - Distributed Objects, Binding a Client to an Object, Static versus Dynamic Remote Method Invocations, Parameter Passing.
Message-Oriented Communication: Persistence and Synchronicity in Communication, Message Oriented Transient and Persistent Communication.

UNIT – II **(13 Periods)**

Processes: Threads, Clients, Servers, Code Migration.
Naming: Naming Entities -Names, Identifiers and Addresses, Name Resolution, the Implementation of a Name Space. Locating Mobile Entities, Removing Unreferenced Entities.

UNIT- III **(12 Periods)**

Synchronization: Clock Synchronization, Logical Clocks, Election Algorithms, Mutual Exclusion.
Consistency and Replication: Introduction, Data- Centric Consistency Models, Client – Centric Consistency Models, Distribution Protocols, Consistency Protocols.

UNIT- IV **(12 Periods)**

Fault tolerance: Introduction to Fault Tolerance, Process Resilence, Reliable Client Server Communication, Reliable Group Communication, Distributed Commit.
Distributed File Systems: Sun Network File System, The Coda File System.

TEXT BOOK:
1. Andrew S.Tanenbaum, Maarten Van Steen, “Distributed Systems: Principles and Paradigms”, 2002, Pearson Education/PHI.

REFERENCE BOOKS:
1. Coulouris, Dollimore, Kindberg, “Distributed Systems-Concepts and Design”, 3rd edition, Pearson Education.
2. Mukesh, Singhal&NiranjanG.Shivarathri, “Advanced Concepts in Operating Systems”, TMH.
3. Sinha, “Distributed Operating System – Concepts and Design”, PHI.

E COMMERCE
ELECTIVE - III
IV B.Tech – VII Semester (Code: 14CS705/C)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT-I **(13 Periods)**

INTRODUCTION: History of E-Commerce–Overview of E-Commerce framework, E-Business models–Network infrastructure, Role of Internet – E-commerce and World wide Web.
E COMMERCE: Consumer oriented E-Commerce applications, mercantile process models, Electronic Payment Systems; Digital Token based EPS, Smart cards, Credit cards, Risks, designing EPS.

UNIT-II **(13 Periods)**

ORGANIZATIONAL COMMERCE AND EDI: Electronic Data Interchange, EDI applications in Business, EDI and E-Commerce, EDI standardization and implementation, Internet based EDI.

UNIT-III **(12 Periods)**

SECURITY: Internet security standards, Secure electronic payment protocols, Cryptography and authentication, Security issues, Encryption techniques, E-Commerce payment mechanisms, SET protocol, Electronic check, Electronic cash, E-Commerce ethics, Regulations and social responsibility.

UNIT-IV **(12 Periods)**

INTELLIGENT AGENTS: Definition and capabilities, Limitation of agents, Security, Web based marketing, Search engines and Directory registration, online advertisements, Portables and info mechanics, Website design issues.

TEXT BOOKS:

1. Ravi Kalakota and Andrew B Whinston,“Frontiers of Electronic Commerce”, Pearson Education Asia, 1999. (Unit- I, II, IV)
2. Marilyn Greenstein and Todd M Feinman,”Electronic commerce: Security, Risk Management and Control” Tata McGraw-Hill, 2000. (Unit- III)

REFERENCE BOOKS:

1. Judy Strauss and Raymond Frost, “E Marketing”, PHI, 2002
2. Brenda Kienan, “ Managing e Commerce Business” , PHI,2001
3. Vivek Sharma and Rajiv Sharma, “Developing E-Commerce Sites-an integrated approach”, Pearson Education Asia, 2000 70 CS – 07-08-SRM – E&T

ONLINE REFERENCES:

http://www.techtutorials.info/ecommerce.html (Unit-I,II)
http://en.wikipedia.org/wiki/Electronic_data_interchange (Unit-III)
http://cs.anu.edu.au/student/comp3410/lectures/security/symmetric-4up.pdf (Unit-IV)
http://www.iseca.org/mirrors/sans.org/4-37.pdf
http://www.webopedia.com/didyouknow.internet/2005/ssl.asp
http://www.cs.berkeley.edu/~russell/aimale/chapter02.pdf

SOFTWARE QUALITY MANAGEMENT
ELECTIVE - III
IV B.Tech – VII Semester (Code: 14CS705/D)

Lectures	:	4 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

UNIT- I **(13 Periods)**

FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE The Role of SQA – SQA Plan – SQA considerations – SQA people – Quality Management – Software Configuration Management **MANAGING SOFTWARE QUALITY:** Managing Software Organizations – Managing Software Quality–Defect Prevention–Software Quality Assurance Management

UNIT- II **(13 Periods)**

SOFTWARE QUALITY ASSURANCE METRICS: Software Quality – Total Quality Management (TQM) – Quality Metrics – Software Quality Metrics Analysis.

UNIT- III **(12 Periods)**

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

UNIT- IV **(12 Periods)**

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

TEXT BOOKS:

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

INDUSTRIAL POLLUTION AND CONTROL
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/CH01)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Man & Environment, Types of Pollution, Pollution control aspects, Industrial emissions-Liquids, Gases, Environmental Legislation, Water quality management in India, Air (Prevention & Control of Pollution) Act.

UNIT – II **(12 Periods)**

Removal of BOD, Biological oxidation, Anaerobic treatment, Removal of Chromium, Removal of Mercury, Removal of Ammonia, Urea, Treatment of Phenallic effluents.

UNIT – III **(13 Periods)**

Removal of Particulate matter, Removal of Sulfur Oxides, Removal of Oxides of Nitrogen, Removal of Organic vapors from Effluent.

UNIT – IV **(12 Periods)**

Pollution control in Chemical Industries, General considerations, pollution control aspects of Fertilizer industries, Pollution control in Petroleum Refineries and Petrochemical units, Pollution control in Pulp and Paper Industries.

TEXT BOOK:

1. Pollution control in Process Industries, S.P .Mahajan, Tata McGraw Hill Publishing Company Ltd, New Delhi

REFERENCE BOOKS:

1. Environmental Pollution Control Engineering, C.S.Rao, Wiley Eastern Ltd., New Age International Ltd.,
2. Air pollution, M.N.Rao, H.V.N.Rao, Tata McGrawhill.
3. Water Pollution control, W.Wesley Eckenfelder Jr.Industrial, Tata McGrawHill.

ENERGY ENGINEERING
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/CH02)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Conventional energy resources, the present scenario, scope for future development.

Coal: Origin, occurrence and reserves, classification, ranking, analysis and testing, coal carbonization, manufacture of coke, coal gasification, coal liquefaction.

UNIT – II **(12 Periods)**

Petroleum: Origin, occurrence and reserves, composition, classification, characteristics, exploration and production.

Petroleum Refining: Refinery processes, petroleum products, testing and analysis of petroleum products.

UNIT – III **(13 Periods)**

Non conventional energy sources: Solar energy, solar radiation, principles of heating and cooling, photo voltaic cells.

Bio gas products, bio-mass, wind energy, hydrogen energy, geothermal and ocean thermal energy, fuel cells.

UNIT – IV **(12 Periods)**

Energy storage, mechanical energy storage, water storage, solar pond, phase change storage, chemical storage.

Energy Conservation: Conservation methods in process industries, Theoretical analysis, practical limitations, equipment for energy saving / recovery.

TEXT BOOKS:

1. Conventional Energy technology, S.B.Pandy, Tata McGraw Hill
2. Fuel Science, Harker and Allen, Oliver & Boyd.
3. Energy conversion, Culp, Mc Graw Hill.

AIR POLLUTION AND CONTROL

OPEN ELECTIVE

IV B.Tech – VII Semester (Code: 14OE706/CE01)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Air Pollution –Definitions, Air Pollutants–Classifications –Natural and Artificial– Primary and Secondary, point and Non-Point, Line and Areal Sources of air pollution-stationary and mobile sources. Effects of Air pollutants on man, material and vegetation: Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, Ozone Holes etc.

UNIT – II **(12 Periods)**

Meteorology and plume Dispersion; properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity, Influence of Meteorological phenomena on Air Quality-wind rose diagrams.

UNIT – III **(13 Periods)**

Lapse Rates, Pressure Systems, Winds and moisture plume behavior and plume Rise Models; Gaussian Model for Plume Dispersion. Control of particulates – Control at Sources, Process Changes, Equipment modifications, Design and operation of control. Equipment's–Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators.

UNIT – IV **(12 Periods)**

General Methods of Control of NOx and Sox emissions–In-plant Control Measures, process changes, dry and wet methods of removal and recycling. Air Quality Management–Monitoring of SPM, SO; NO and CO Emission Standards.

NOTE:

Two questions of 12 marks each will be given from each unit out of which one is to be answered. Twelve questions of one mark each will be given from entire syllabus which is a compulsory question.

TEXTBOOKS:

1. Air pollution By M.N.Rao and H.V.N.Rao –Tata Mc.Graw Hill Company.
2. Air pollution by Warkand Warner.-Harper & Row, NewYork.

REFERENCE BOOK:

1. An introduction to Air pollution by R.K.Trivedy and P.K.Goel, B.S.Publications.

REMOTE SENSING AND GIS
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/CE02)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Concepts and Foundations of Remote Sensing: Introduction, Energy sources and radiation principles, Energy interactions in the atmosphere, Energy interactions with Earth surface features, an ideal remote sensing system, characteristics of remote sensing systems, application of remote sensing .

UNIT – II **(13 Periods)**

Visual Image Interpretation: Introduction, Fundamentals of visual image interpretation, basic visual image interpretation equipment, land use and land cover mapping, geologic and soil mapping, agricultural applications, forestry applications, water resources applications, urban and regional planning applications.

UNIT – III **(12 Periods)**

Digital Image Processing: Introduction, Image rectification and restoration, Image enhancement, contrast manipulation, spatial feature manipulation, Image Classification, Supervised classification, the classification stage, the training stage, Un-supervised classification, Classification accuracy assessment.

UNIT – IV **(12 Periods)**

Geo-graphical Information Systems (GIS):Introduction, spatial information system: an overview, conceptual model of spatial information, concept of databases, digitizing, editing, and structuring map data, data quality and sources of errors in GIS, spatial data analysis (vector based), spatial data analysis (raster based), Fundamental concepts of GPS, Types of GPS, GPS satellite, Application of GPS in resource surveys, mapping and navigation.

TEXT BOOKS:

1. Lillisand.T.M, Keifer.R.W, and Chipman.J.WRemotesensind Image interpretation, 2004, John Wlley and Sons.
2. Chrisman, N.R. (1997), Exploring Geographic Information systems, John Willey and sons
3. Remote Sensing and its applications by LRA Narayana University Press 1999.
4. Principals of Geo physical Information Systems - Peter ABurragh and Rachael A. Me Donnell, Oxford Publishers 2004.

REFERENCE BOOKS:

1. Concepts & Techniques of GIS by C.P.Lo Albert, K.W. Yonng, Prentice Hall (India) Publications.
2. Remote Sensing and Geographical Information systems by M.Anji Reddy JNTU Hyderabad 2001,
3. B.S.Publications.GIS by Kang - tsungchang, TMH Publications & Co.
4. Basics of Remote sensing & GIS by S.Kumar, Laxmi Publications.
5. Fundamental of GIS by Mechanical designs John Wiley & Sons.

DATABASE MANAGEMENT SYSTEMS
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/CS01)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Databases and Database Users: Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications - When Not to Use a DBMS.

Database System Concepts and Architecture: Data Models, Schemas, and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems.

Data Modeling Using the Entity-Relationship (ER) Model: Using High-Level Conceptual Data Models for Database Design - An Example Database Application - Entity Types, Entity Sets, Attributes, and Keys - Relationship Types, Relationship Sets, Roles, and Structural Constraints - Weak Entity Types - Refining the ER Design for the COMPANY Database - ER Diagrams, Naming Conventions, and Design Issues.

UNIT – II **(12 Periods)**

The Relational Data Model and Relational Database Constraints: Relational Model Concepts - Relational Model Constraints and Relational Database Schemas - Update Operations, Transactions, and Dealing with Constraint Violations - Relational Database Design Using ER-to-Relational Mapping.

Basics of SQL: DDL, DML and DCL Commands.

UNIT – III **(13 Periods)**

Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form.

Relational Database Design Algorithms and Further Dependencies: Properties of Relational Decompositions - Algorithms for Relational Database Schema Design – Multivalued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form.

UNIT – IV **(12 Periods)**

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing - Transaction and System Concepts - Desirable Properties of Transactions - Characterizing Schedules Based on Recoverability - Characterizing Schedules Based on serializability.

Concurrency Control Techniques: Two-Phase Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering – Multiversion Concurrency Control Techniques - Validation (Optimistic) Concurrency Control Techniques - Granularity of Data Items and Multiple Granularity Locking.

TEXT BOOK:

1. "Fundamentals of Database Systems", RamezElmasri and Navate Pearson Education, 5th edition.

REFERENCE BOOKS:

1. "Introduction to Database Systems", C.J.Date Pearson Education.
2. "Data Base Management Systems", Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill, 3rdEdition.
3. "Data base System Concepts", Silberschatz, Korth, McGraw hill, 5th edition.

JAVA PROGRAMMING
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/CS02)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Introduction: Introduction to java, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.
Classes and Objects : Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.
Inheritance: Basic concepts, access specifires, usage of super key word, method overriding, final methods and classes, abstract classes, dynamic method dispatch, Object class.
Interfaces: Differences between classes and interfaces, defining an interface, implementing interface, variables in interface and extending interfaces.
Packages: Creating a Package, setting CLASSPATH, Access control protection, importing packages.
Strings: Exploring the String class, String buffer class, Command-line arguments.

UNIT – II **(13 Periods)**

Exception Handling: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes.
Multithreading: Concepts of Multithreading, differences between process and thread, thread life cycle, Thread class, Runnable interface, creating multiple threads, Synchronization, thread priorities.
Applets: Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets, accessing remote applet, Color class and Graphics

UNIT – III **(12 Periods)**

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.
AWT: AWT Components, windows, canvas, panel, File Dialog boxes, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menu bar.

UNIT – IV **(12 Periods)**

Swing-I – swings introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons.

JDBC Connectivity: Jdbc connectivity, types of Jdbc Drivers, connecting to the database, Jdbc Statements, Jdbc Exceptions, Manipulations on the database, Metadata.

TEXT BOOKS:

1. "The Complete Reference Java J2SE", 7th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.
2. "Big Java", 2nd Edition, Cay Horstmann, John Wiley and Sons, Pearson Education.

REFERENCE BOOKS:

1. "Java How to Program", Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
2. "Core Java 2", Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
3. "Core Java 2", Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
4. "Beginning in Java 2", Iver Horton, Wrox Publications.
5. "Java", Somasundaram, Jaico.
6. "Introduction to Java programming", By Y.DanielLiang, Pearson Publication.

OPTIMIZATION TECHNIQUES

OPEN ELECTIVE

IV B.Tech – VII Semester (Code: 14OE706/EE01)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Linear Programming: Introduction and formulation of models – Convexity - simplex method - Bid method - two phase method – degeneracy – nonexistent and unbounded solutions - duality in L.P. - dual simplex method - sensitivity analysis - revised simplex method - transportation and assignment problems.

UNIT – II **(13 Periods)**

Non-linear Programming: Classical optimization methods - equality and inequality constraints - Lagrange multipliers and Kuhn-Tucker conditions - quadratic forms - quadratic programming and Bessel's method.

UNIT – III **(12 Periods)**

Search Methods: One dimensional optimization - sequential search - Fibonacci search - multi dimensional search method - Univariate search - gradient methods - steepest descent / ascent methods - conjugate gradient method -Fletcher – Reeves method - penalty function approach.

UNIT – IV **(12 Periods)**

Dynamic Programming: Principle of optimality recursive relation - solution of linear programming problem - simple examples

TEXT BOOKS:

1. Engineering Optimization: Theory and Practice by S.S. Rao, 3rd Ed., New Age International, 1998
2. Optimization Methods in Operations Research and Systems Analysis by K.V. Mittal and C. Mohan, 3rd Ed, New Age International, 1996.

REFERENCE BOOKS:

1. Non-linear Programming by P.L. Mangassarian.
2. Operations Research by S.D. Sharma.
3. Operations Research: An introduction by H.A. Taha, 6th Edition, PHI.
4. Linear Programming by G. Hadley.

NON-CONVENTIONAL ENERGY SOURCES

OPEN ELECTIVE

IV B.Tech – VII Semester (Code: 14OE706/EE02)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Principle of Renewable Energy: Comparison of renewable and conventional energy sources - Ultimate energy sources - natural energy currents on earth - primary supply to end use - Spaghetti & Pie diagrams - energy planning - energy efficiency and management.

UNIT – II **(13 Periods)**

Solar Radiation: Extra terrestrial solar radiation - terrestrial solar radiation - solar thermal conversion - solar thermal central receiver systems - photovoltaic energy conversion - solar cells – 4 models.

UNIT – III **(12 Periods)**

Wind energy: Planetary and local winds - vertical axis and horizontal axis wind mills - principles of wind power - maximum power - actual power - wind turbine operation - electrical generator.

UNIT – IV **(12 Periods)**

Energy from Oceans: Ocean temperature differences - principles of OTEC plant operations - wave energy - devices for energy extraction – tides - simple single pool tidal system.

Geothermal energy: Origin and types - Bio fuels – classification - direct combustion for heat and electricity generator - anaerotic digestion for biogas - biogas digester - power generation.

TEXT BOOK:

1. Renewable Energy Sources by John Twidell& Toney Weir : E&F.N. Spon.

REFERENCE BOOKS:

1. Power plant technology by EL-Wakil, McGraw-Hill.
2. Non-Conventional Energy Sources by G.D.Rai, Khanna Pub.

CONSUMER ELECTRONICS
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/EC01)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Microphones, Headphones and Headsets, Loud Speakers, Disc Recording and Reproduction, Amplifying Systems Equalizers and Mixers, Electronic Music Synthesizers.

UNIT – II **(13 Periods)**

Commercial Sound, Theatre Sound System, Audio Systems , Color TV standards and Systems, Remote Controls, Video Systems.

UNIT – III **(12 Periods)**

Electronic Gadgets and Home Appliances:
Telecommunication Systems, Switching Systems, Modulation Techniques, Carrier Systems, Fibre Optics

UNIT – IV **(12 Periods)**

Data Services, Mobile Systems, Facsimile fax, Xerography

TEXT BOOK:

1.Consumer Electronics by S.P.Bali, Pearson Education, ISBN: 9788131717592.

REFERENCE BOOKS:

1. Consumer Electronics for Engineers by Philip Herbert Hoff, Cambridge University Press (July 28, 1998), **ISBN-10:** 0521582075
2. Digital Consumer Electronics Handbook by RonadlK.Jurgen, (Editor) by McGraw Hill Professional Publishing, 1997. **ISBN-10:** 0070341435.

EMBEDDED SYSTEMS
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/EC02)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Introduction to embedded systems, design challenges, processor technology, IC technology, design technology, tradeoffs, single purpose processor, RT level combinational logic, sequential logic (RT level) custom single purpose processor design, optimizing custom single purpose processors. General purpose processors: basic architecture, pipelining, programmers view, development environment, ASIPS, microcontrollers and digital signal processors

UNIT – II **(13 Periods)**

State machine and concurrent process models: models vs. languages, FSMD, using state machines, PSMM, concurrent process model, concurrent processes, communication and synchronization among processes, data flow model and real time systems. Need for communication interfaces, RS232/UART, RS422/RS485, USB, Infrared, IEEE 802.11, and Bluetooth.

UNIT – III **(12 Periods)**

Embedded system and RTOS concepts: Architecture of kernel, tasks and task scheduler, interrupt service routines, semaphores, mutex. Mail boxes, message queues, event registers, pipes and signals.

UNIT – IV **(12 Periods)**

Embedded system and RTOS concepts: Timers, memory management, priority inversion problem, embedded OS and real time OS, RT Linux, and Handheld OS. Design technology: Introduction, automation, synthesis, parallel evolution of compilation and synthesis, logic synthesis, RT synthesis, behavioural synthesis, system synthesis, HW / SW co- design, verification, and co-simulation.

TEXT BOOKS:

1. Frank Vahid, Tony D Givargis, Embedded system design – A unified HW/ SW Introduction, John Wily & sons, 2002.
2. KVKK Prasad, Embedded and real time systems, Dreemtech Press, 2005.

REFERENCE BOOKS:

1. Raj Kamal, Embedded system architecture, programming and design, TMH edition.
2. Mohammad Ali Mazidi, Janice G., The 8051 microcontroller and embedded systems, Pearson edition.
3. Jonathan W Valvano, Embedded Microcomputer Systems, Brooks/cole, Thompson Learning.
4. David E. Simon, An Embedded Software Primer, Pearson edition.

VIRTUAL INSTRUMENTATION USING LABVIEW
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/EI01)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

REVIEW OF VIRTUAL INSTRUMENTATION: Historical perspective, Need of VI, Advantages of VI, Define VI, block diagram & architecture of VI, data flow techniques, graphical programming in data flow, comparison with conventional programming.

PROGRAMMING TECHNIQUES: VIS and sub-VIS, loops & charts, arrays, clusters, graphs, case & sequence structures, formula modes, local and global variable, string & file input. Graphical programming in data flow, comparison with conventional programming.

UNIT – II **(13 Periods)**

DATA ACQUISITION BASICS: ADC, DAC, DIO, Counters & timers, PC Hardware structure, timing, interrupts, DMA, Software and Hardware Installation. GPIB/IEEE 488 concepts, and embedded system buses - PCI, EISA, CPCI, and USB & VXI. A

UNIT – III **(12 Periods)**

COMMON INSTRUMENT INTERFACES: Current loop, RS 232C/RS 485, GPIB, System basics, interface basics: USB, PCMCIA, VXI, SCXI, PXI etc., networking basics for office & industrial application VISA & IVI, image acquisition & processing, Motion Control. ADC, DAC, DIO, DMM, waveform generator.

UNIT – IV **(12 Periods)**

USE OF ANALYSIS TOOLS AND APPLICATION OF VI: Fourier transforms Power spectrum, Correlation methods, windowing & flittering. Application in Process Control projects, Major equipments- Oscilloscope, Digital Multimeter, Pentium Computers, temperature data acquisition system, motion control employing stepper motor.

TEXT BOOKS:

1. Gary Johnson, LABVIEW Graphical Programming , 2nd Edition, McGraw Hill, 1997.
2. Lisa K. Wells and Jeffrey Travis, LABVIEW for Everyone , PHI, 1997.
3. Skolkoff, Basic concepts of LABVIEW 4 , PHI, 1998.

REFERENCE BOOKS:

1. S. Gupta, J.P. Gupta, *PC Interfacing for Data Acquisition and Process Control*, ISA, 2nd Edition, 1994.
2. Technical Manuals for *DAS Modules of Advantech* and National Instruments.
3. L.T. Amy, *Automation System for Control and Data Acquisition*, ISA, 1992.

SENSORS and TRANSDUCERS
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/EI02)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Introduction: Definition related to measurements /instrumentation, static and dynamic characteristics of instruments, classification of transducers.

UNIT – II **(13 Periods)**

Displacement Measurement: Variable resistance devices, variable inductance devices, variable capacitance devices, digital displacement transducers.

Strain measurement: Stress-strain relations, resistance strain gauges, types of strain gauges, strain gauge measurement techniques, static measurements ,dynamic measurements. Calibration of strain gauge, strain gauge load cell, force and torque measurements using strain gauge.

UNIT – III **(12 Periods)**

Pressure measurement: Diaphragm, Bellows, Bourdon tubes, Resistive inductive and capacitive transducers, piezo-electric transducers.

Low pressure measurement: McLeod gauge, Knudson gauge, Ionization gauge.

Temperature measurement: RTD, Thermocouple and thermistor.

UNIT – IV **(12 Periods)**

Flow measurement: Head type flow meters, Rotometer, Electromagnetic flow meter.

Measurement of liquid level, viscocity, humidity and moisture.

TEXT BOOKS:

1. A.K.Ghosh, Introduction to Instrumentation and Control, PHI.
2. BC Nakra, KK Chaudhry, Instrumentation measurement and analysis, TMH, New Delhi second edition.

REFERENCE BOOKS:

1. PatranabisD,"Sensors and transducers", second edition, PHI, New Delhi 2003.

Ernest O Doeblin, "Measurement Systems Application and Design", TMH.

WEB PROGRAMMING
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/IT01)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Introduction to XHTML, Cascading Style Sheets (CSS), JavaScript: Introduction to Scripting, Control Statements, Part 1, Control Statements, Part 2, Functions, Arrays, Objects.

UNIT – II **(13 Periods)**

Dynamic HTML: Object Model and Collections, Dynamic HTML: Event Model, XML, RSS (Really Simple Syndication).

UNIT – III **(12 Periods)**

Building Ajax-Enabled Web Applications, Web Servers (IIS and Apache).

UNIT – IV **(12 Periods)**

Servlets and Java Server Pages.

TEXT BOOK:

1. Harvey M. Deitel and Paul J. Deitel,“Internet & World Wide Web How to Program”, 4/e,Pearson Education.

REFERENCE BOOKS:

1. Jason Cranford Teague, “Visual Quick Start Guide CSS, DHTML &AJAX”, 4e, Pearson Education.
2. Tom NerinoDoli smith, “JavaScript & AJAX for the web”, Pearson Education 2007.
3. Joshua Elchorn, “Understanding AJAX”, Prentice Hall 2006.
4. Marty Hall, Larry Brown, “Core Servlets and JavaServer Pages™: Volume 1: Core Technologies”, 2nd Edition, Prentice Hall.

MOBILE APPLICATION DEVELOPMENT
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/IT02)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

Introduction: Introduction to java, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.

Classes and Objects : Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Inheritance: Basic concepts, access specifiers, usage of super key word, method overriding, final methods and classes, abstract classes, dynamic method dispatch, Object class.

Interfaces: Differences between classes and interfaces, defining an interface, implementing interface, variables in interface and extending interfaces.

UNIT – II **(13 Periods)**

Packages: Creating a Package, setting CLASSPATH, Access control protection, importing packages.

Strings: Exploring the String class.

Exception Handling: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes.

I/O Streams: Streams, Byte streams, Character streams, File class, File streams.

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.

UNIT – III **(12 Periods)**

Introduction: Introduction to Mobile Application Development, Constraints and requirements of mobile Apps, Understanding the available mobile platforms

Overview of Android: Introduction to Android OS, History of Android, Versions of Android, Android Architecture.

Understanding the development Environment: Developing Android applications using Eclipse, creating the first Android application, Anatomy of the Android Application, Working with the emulators.

Application Components: Activities, Services, Content Providers, Broadcast Receivers, Understanding Activity, Activity's Life Cycle and Intents.

Creating UI for Android: Android Views and View Groups, Android Layouts, Basic Views, Picker views, List views, Additional views (Image Views, Gallery view and Image Switcher) and working with menus. Understanding and working with screen Orientation.

UNIT – IV **(12 Periods)**

Data Persistence: Shared Preferences, Working with Files, Working with databases (SQLite).
Content Providers: Accessing the Contacts using Content Providers.
Messaging &Email: Sending SMS, Sending e-mails.
Working with Location: Obtaining the location of mobile using GPS and A-GPS, Displaying the Location on Maps.
Services and Broadcast Receivers: Working with Services and broadcast receivers.
Publishing Apps: Preparing for publishing and deploying the APK file.

TEXT BOOK:

1. "The Complete Reference Java J2SE", 7th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi (for UNIT – I)
2. Beginning Android application development, Wei-Meng Lee, Wiley Publishing Inc.(for UNIT – II)

REFERENCE BOOKS:

1. "Java How to Program", Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
2. Learn JAVA for Android Development, Jeff Friesen, Apress Publications.

AUTOMOBILE ENGINEERING
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/ME01)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

INTRODUCTION: Classification of vehicles – applications, options of prime movers, transmission and arrangements.

ENGINE: Engine Classifications - number of strokes, cylinders, types of combustion chambers for petrol and diesel engines, valves, valve arrangements and operating Mechanisms, Piston - design basis, types, piston rings, firing order; Crankshafts, Flywheel.

ASSORTED EQUIPMENT: Fuel supply pumps, Mechanical and Electrical type Diaphragm pumps, Air and Fuel Filters, super chargers, Mufflers.

UNIT – II **(13 Periods)**

COOLING SYSTEMS: Need for cooling system, Air and water cooling.

LUBRICATING SYSTEMS: Various lubricating systems for I.C. Engines.

ELECTRICAL SYSTEM: Ignition system, Spark plugs, Distributor, Electronic Ignition, Alternator, cutout, Current and voltage regulators, charging circuit, starting motors, lighting, instruments and accessories.

UNIT – III **(12 Periods)**

CHASSIS & TRANSMISSION SYSTEMS: Introduction to Chassis & Transmission, Clutches – Single-plate and Multi-plate clutches, Centrifugal clutches, wet and dry type, actuating mechanisms.

TRANSMISSION: Gear Box - Theory, Four speed and Five Speed Sliding Mesh, Constant mesh & synchromesh type, selector mechanism, automatic transmission, overdrive, propeller shaft, differential - principle of working.

UNIT – IV **(12 Periods)**

SUSPENSION SYSTEMS: Need for suspension systems, springs, shock absorbers, axles – front and rear, different methods of floating rear axle, front axle and wheel alignment. **VEHICLE CONTROL:** steering mechanisms and power steering, types of brakes and brake actuation mechanisms (air and hydraulic).

TEXT BOOKS:

1. Automobile Engineering - G.B.S.Narang.
2. Automobile Engineering -R.B.Gupta
3. Automobile Engineering - Vol I & II - Kirpal Singh

REFERENCE BOOKS:

1. Automotive Mechanics - Joseph Heitner
2. Automobile Engineering -S.Srinivasan

REFRIGERATION AND AIR CONDITIONING
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/ME02)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Note: Qualitative treatment

UNIT – I **(13 Periods)**

INTRODUCTION TO REFRIGERATION: Necessity and applications, unit of refrigeration and C.O.P, mechanical refrigeration, types of ideal cycle of refrigeration, Refrigerants- desirable properties, commonly used refrigerants, nomenclature.

AIR REFRIGERATION: Bell Coleman cycle and Brayton cycle, Open and Dense air systems, Actual refrigeration system, refrigeration needs of aircrafts, adoption of air refrigeration, Justification, types of systems.

UNIT – II **(13 Periods)**

VAPOUR COMPRESSION REFRIGERATION: Working principle, essential components of plant, simple vapor compression refrigeration cycle, Multi pressure systems – multistage compression, multi evaporator system, Cascade system, and use of p – h charts.

COMPONENTS: Compressors- general classification, comparison, advantages and disadvantages, Condensers - classification, working, Evaporators - classification, working, Expansion devices - types, working.

UNIT – III **(12 Periods)**

VAPOUR ABSORPTION SYSTEM: Calculation of max COP, description and working of NH_3 - water system, Li - Br, H_2O system, principle of operation of three fluid absorption system and salient features.

STEAM JET REFRIGERATION: Principle of working, application, merits and demerits.

NON-CONVENTIONAL REFRIGERATION METHODS: Principle and operation of thermo electric refrigerator and Vortex tube or Hirsch tube.

UNIT – IV **(12 Periods)**

INTRODUCTION TO AIR CONDITIONING: Psychometric properties and processes, sensible and latent heat loads, need for ventilation, infiltration, concepts of RSHF, ASHF, ES HF & ADP, concept of human comfort and effective temperature, comfort air conditioning, industrial air conditioning requirements, air conditioning load calculations.

AIR CONDITIONING SYSTEMS: Classification of equipment, cooling, heating, humidification and dehumidification, filters, grills and registers, deodorants, fans and blowers, heat pump, heat sources, different heat pump circuits, application.

TEXT BOOKS:

1. Refrigeration and air conditioning - C.P.Arora, TMH.

2. Refrigeration and Air conditioning - Manohar Prasad, New Age India, New Delhi.

3. A course in refrigeration and air conditioning - S.C.Arora&Domkundwar, Dhanpat Rai& sons, New Delhi.

REFERENCE BOOKS:

1. Principles of Refrigeration - Dossat.

2. Refrigeration and air conditioning - Stoecker.

NOTE: Refrigeration and Air conditioning Data book by Manohar Prasad is allowed in the exam

AUTOMATION TECHNOLOGY
OPEN ELECTIVE
IV B.Tech – VII Semester (Code: 14OE706/BR01)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 Periods)**

FUNDAMENTAL PRINCIPLES: Industrial prime movers - A brief system comparison: An electrical system, A hydraulic system, A pneumatic system, A comparison - Definition of terms: Mass and force, Pressure, Work, energy and power, Torque - Pascal's law - Gas laws.
HYDRAULIC PUMPS AND PRESSURE REGULATION: Pressure regulation - Pump types: Gear pumps, Vane pumps - Loading valves - Filters.
AIR COMPRESSORS, AIR TREATMENT AND PRESSURE REGULATION: Piston compressors Air receivers and compressor control - Stages of air treatment - Pressure regulation: Relief valves, Non-relieving pressure regulators and Relieving pressure regulators - Service units.

UNIT – II **(13 Periods)**

CONTROL VALVES: Graphic symbols - Types of control valve: Poppet valves, Spool valves, Rotary valves - Pilot-operated valves - Check valves: Pilot-operated check valves, Restriction check valves - Shuttle and fast exhaust valves - Sequence valves - Time delay valves
ACTUATORS: Linear actuators - Mounting arrangements and Cylinder dynamics - Seals - Rotary actuators: Constructional details - Applications: Speed control, Actuator synchronization, Regeneration, Counter balance and dynamic braking, Pilot-operated check valves, Pre-fill and compression relief.

UNIT – III **(12 Periods)**

SENSORS: Sensors and Transducers - Performance Terminology – Sensors: Displacement, : Position, and Proximity - Velocity and Motion - Force - Fluid Pressure - Liquid Flow - Liquid level - Temperature - Light Sensors - Selection of Sensors - Inputting data by switches.

UNIT – IV **(12 Periods)**

PROGRAMMABLE LOGIC CONTROLLER: Programmable - Basic PLC structure - Input / Output Processing - Ladder Programming - Instruction lists - Latching and internal relays - Sequencing - Timers and Counters - Shift registers - Master and Jump Controls - Data Handling - Analog input / output.
MECHATRONIC SYSTEMS: Mechatronic designs, Case studies: Timed switch, A pick-and-place robot and Car park barriers.

Text Books:

1. Andrew Parr, Hydraulics and Pneumatics - A Technician's and Engineer's Guide, Jaico Publishing House, 2005.
2. W. Bolton, Mechatronics, Fourth Edition, Pearson Education, 2010.

Reference Books:

1. Anthony Esposito, Fluid Power with Applications, Fifth Edition, Pearson Education, 2005

BUSINESS COMMUNICATION AND PRESENTATION SKILLS LAB
IV B.Tech – VII Semester (Code: 14ELL701)

Lectures	:	2 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT-I

Identity Management Communication: Face to Face Impression Management & Mediated Communication (Self Introduction & Self-Promoting– Over Stating and under stating – Strategies to Overcome Communicative Inhibitions – Creating Positive Self-image through words - Appearance- Verbal and Non Verbal Manners) – Giving Polite Yet Assertive Responses – Responsive strategies to handle criticism - Accepting Failure and Declaring Success.

UNIT-II

Business Presentations: Oral and Power Point Presentations; Preparing Successful Presentations; Assessing Audience, Making Effective Use of Visual Aids, Delivering Presentation, Using Prompts, Handling With Questions and Interruptions, Mock Presentations.

UNIT-III

Oratory Skills: Group Discussion, Extempore, Mock Parliament and Mock Press.

UNIT-IV

Interview Management: Resume Preparation, Types of Interviews, Preparing For Interviews, Facing Interviews, Handling Tough & Tricky Questions, Reviewing Performance, Participating In Mock Interviews

INTRODUCTION TO CYBER SECURITY LAB
IV B.Tech – VII Semester (Code: 14CSL702)

Lectures	:	3 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

1. Procedure for Kali Linux and virtual machine Installation.
2. XSS Attack by using Kali Linux.
3. SQL Injection.
4. Session Hijacking the Application with cookie manager by using Wireshark.
5. TCP Hijacking the Application with NETCAT by using Wire shark.
6. Malware analysis for security metrics.
7. Iptables for firewall security auditing.
8. Snort for IDS security auditing.
9. Setoolkit for Social Engineering Auditing.
10. Nessus for Vulnerability Scanning and Assessment.
11. Nmap for Vulnerability Scanning and Assessment.
12 Metasploit for Vulnerability Scanning and Assessment.

ADVANCED DATA ANALYTICS LAB
IV B.Tech – VII Semester (Code: 14CSL703)

Lectures	:	3 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

1. Conduct the following Hypothesis tests on the Lung capacity dataset.
    a. One sample t-test on the Lung capacity dataset
    b. Two sample t-test on the Lung capacity dataset
    c. Two sample paired t-test on the students marks dataset
    d. Directional hypothesis test on the Lung capacity dataset
    e. Wilcoxon U-test on the students marks and ranks dataset
2. Demonstrate the following using Lung capacity dataset.
    a. Correlation
    b. Covariance
    c. Correlation Test
3. Perform the Hierarchical cluster analysis on iris dataset with
    a. Single linkage method
    b. Complete linkage method
    c. Average linkage method
4. Do cluster analysis on Iris dataset using k-means clustering algorithm
5. Do cluster analysis on Iris dataset using Partitioning Around Medoids (PAM) algorithm.
6. Generate decision tree to classify objects in Iris dataset using ctree function.
7. Generate decision tree to classify objects in Iris dataset using random forest function.
8. Using Support Vector Machine classify objects in Iris dataset.

TERM PAPER

IV B.Tech – VII Semester (Code: 14CSL704)

Lectures	:	2 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

It is aimed as a precursor to the project work done in the second semester of the final year B.Tech. It should help the students to identify their Research area/topic and should form the groundwork and preliminary research required for the project work. The batches formed for pursuing the project work in the final year shall select some research article published in the latest journals of IEEE, ACM and other related journals. Each batch should refer to a minimum of FIVE reference sources outside their prescribed textbooks. The batch must gain an understanding of the research tools used and the related material, available both in printed and digital formats. Each project batch must make the presentation for two rounds on the same research article about their understanding, conclusion and if possible propose the extensions for the work. Each individual of the batch must give the presentation in both the rounds.

At the end of the semester, the batch must submit a report in IEEE format, on the work they have pursued throughout the semester containing

- The aim and objective of the study.
- The Rationale behind the study.
- The work already done in the field and identified.
- Hypothesis, experimentation and discussion.
- Conclusion and further work possible. Appendices consisting of illustrations,
- Tables, Graphs etc.,

Evaluation is to be done for the two presentations made and the report submitted. Method of Continuous Assessment (CA):

1. Day to day work	-	10 marks
2. Seminar – I	-	10 marks
3. Term Paper Report	-	10 marks
4. Seminar – II	-	10 marks

TOTAL		40 marks

Final Examination (FE) shall be conducted for 60 marks by one internal and one external examiner appointed by the principal. The FE contains Viva-voce and the demonstration of the model developed or work performed as a part of the term paper.

INDUSTRIAL MANAGEMENT & ENTERPRENEURSHIP DEVELOPMENT
IV B.Tech – VIII Semester (Code: 14ME801)

Lectures	:	4 Periods/week,Tutorial:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 periods)**

General management: Management definition, Functions of Management and Principles of Management.

Forms of Business Organization: Salient features of Sole Proprietorship, Partnership, Joint Stock Company: Private Limited and Public Limited companies; Merits and Demerits of above types

Marketing Management: Functions of Marketing, Concepts of Selling and Marketing, Marketing mix (4 Ps); Advertising and sales promotion; Product life cycle.

UNIT – II **(12 periods)**

Production Management: Types of production systems, Productivity vs. Production, Production planning and control.

Materials Management: Inventory Control, Basic EOQ model, ABC analysis.

Quality Control: Control Charts: chart, R chart, P chart, C chart, Acceptance sampling.

UNIT – III **(13 periods)**

Financial Management: Functions of finance, Types of Capital-Fixed and Working Capital, Break Even Analysis.

Depreciation- Straight line method of depreciation, declining balance method and the Sum of Years digits method of Depreciation.

Personnel Management: Functions of personnel management, human resource planning, recruitment, selection, placement, training and development and performance appraisal. Motivation theories, leadership styles.

UNIT – IV **(12 periods)**

Entrepreneurship Development: Introduction, Entrepreneurial characteristics, Functions of an Entrepreneur; Factors affecting entrepreneurship; Role of communication in entrepreneurship; Entrepreneurial development-Objectives, Need of Training for enterprises; Finance for the enterprises; Product, Process and Plant Design- Product analysis and Product Design process. Steps in process design and Plant Design.

TEXT BOOKS:

1. Industrial Engineering and Operations Management, S.K.Sharma, Savita Sharma and Tushar Sharma.
2. Industrial Engineering and Production Management, Mahajan.
3. Management Science, A.R.Aryasri

REFERENCE BOOKS:

1. Operations Management, Joseph G Monks.
2. Marketing Management, Philip Kotler.
3. The Essence of Small Business, Barrow colin.
4. Small Industry Ram K Vepa

ADVANCED CYBER SECURITY

IV B.Tech – VIII Semester (Code: 14CS802)

Lectures	:	4 Periods/week,Tutorial:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

Syllabus will be given by NASSCOM

SOFTWARE TESTING METHODOLOGIES

ELECTIVE - IV

IV B.Tech – VIII Semester (Code: 14CS803/A)

Lectures	:	4 Periods/week, Self Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 periods)**

Principles of Testing; Software Development Life Cycle Models: Phases of Software Project, Quality, Quality Assurance and Quality Control, Testing, Verification and Validation, Process Model to Represent Different Phases.

White Box Testing: Static Testing, Structural Testing, Challenges. **Black Box Testing:** What, Why, When, How.

UNIT – II **(14 periods)**

Integration Testing: Integration Testing as a Type of Testing, Integration Testing as a Phase of Testing, Scenario Testing, Defect Bash.

System and Acceptance Testing: Overview, Functional Versus Non-Functional, Functional System Testing & Non-Functional, Acceptance Testing.

Performance Testing: Introduction, Factors, Methodology, Tools & Process.

Regression Testing: Introduction, Types, When to do Regression Testing, how to do Regression Testing, Best Practices in Regression Testing.

UNIT – III **(16 periods)**

Ad hoc Testing: Overview, Buddy Testing, Pair Testing, Exploratory Testing, Iterative, Agile and Extreme Testing, Defect Seeding.

Usability and Accessibility Testing: Approach to Usability, When to do Usability, How to achieve Usability, Quality Factors for Usability, Aesthetics Testing, Accessibility Testing, Tools for Usability, Usability Lab Setup, Test Roles for Usability.

Common People Issues: Perceptions and Misconceptions About Testing, Comparison between Testing and Development Functions, Providing Career Paths for Testing Professionals, Role of the Ecosystem and a Call for Action.

Organization Structures for Testing Teams: Dimensions of Organization Structures, Structures in Single-Product Companies, Multi-product Companies, Effects of Globalization and Geographically Distributed Teams on Product Testing, Testing Services Organizations, Success Factors for Testing Organizations.

UNIT – IV **(14 periods)**

Test Planning, Management, Execution and Reporting: Introduction, Planning, Management, Process, and Reporting, Best Practices.

Software Test Automation: Terms used in Automation, Skills needed for Automation, What to Automate, Scope of Automation, Design and Architecture for Automation, Generic Requirements for Test Tools, Process Model for Automation, Selecting a Test Tool, Automation for Extreme Programming Model, Challenges.

Test Metrics and Measurements: Metrics & Measurements, Types, Project, Progress, Productivity, Release.

TEXT BOOK:

1. Srinivasa Desikan & Gopalaswamy Ramesh, "Software Testing – Principles and Practices", Pearson Education, 2007.

REFERENCES BOOKS:

1. "Software Testing techniques", BarisBeizer, Dreamtech, second edition.
2. "The craft of software testing", Brian Marick, Pearson Education.
3. "Software Testing Techniques", SPD (Oreille).
4. "Software Testing – Effective Methods, Tools and Techniques", RenuRajani, Pradeep Oak, TMK.
5. "Effective methods of Software Testing", Perry, John Wiley.

WEB MINING
ELECTIVE - IV
IV B.Tech – VIII Semester (Code: 14CS803/B)

Lectures	:	4 Periods/week, Self Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 periods)**

INTRODUCTION:

Introduction – Web Mining – Theoretical background –Algorithms and techniques – Association rule mining – Sequential Pattern Mining -Information retrieval and Web search – Information retrieval Models-Relevance Feedback- Text and Web page Pre-processing – Inverted Index – Latent Semantic Indexing – Web Search – Meta-Search – Web Spamming

UNIT – II **(15 periods)**

WEB CONTENT MINING:

Web Content Mining – Supervised Learning – Decision tree - Naïve Bayesian Text Classification -Support Vector Machines - Ensemble of Classifiers. Unsupervised Learning - K-means Clustering -Hierarchical Clustering –Partially Supervised Learning – Markov Models - Probability-Based Clustering - Evaluating Classification and Clustering – Vector Space Model – Latent semantic Indexing – Automatic Topic Extraction - Opinion Mining and Sentiment Analysis – Document Sentiment Classification

UNIT – III **(14 periods)**

WEB LINK MINING:

Web Link Mining – Hyperlink based Ranking – Introduction -Social Networks Analysis- Co-Citation and Bibliographic Coupling - Page Rank -Authorities and Hubs -Link-Based Similarity Search -Enhanced Techniques for Page Ranking - Community Discovery – Web Crawling -A Basic Crawler Algorithm- Implementation Issues- Universal Crawlers- Focused Crawlers- Topical Crawlers-Evaluation - Crawler Ethics and Conflicts - New Developments

UNIT – IV **(15 periods)**

STRUCTURED DATA EXTRACTION:

Structured Data Extraction: Wrapper Generation – Preliminaries- Wrapper Induction- Instance-Based Wrapper Learning ·- Automatic Wrapper Generation: Problems - String Matching and Tree Matching -.Multiple Alignment - Building DOM Trees - Extraction Based on a Single List Page and Multiple pages- Introduction to Schema Matching - Schema-Level Match -Domain and Instance-Level Matching – Extracting and Analyzing Web Social Networks.

REFERENCES:

1. Bing Liu, “Web Data Mining: Exploring Hyperlinks, Contents, and Usage Data (Data-Centric Systems and Applications)”, Springer; 2nd Edition 2009
2. GuandongXu, Yanchun Zhang, Lin Li, “Web Mining and Social Networking: Techniques and Applications”, Springer; 1st Edition.2010
3. Zdravko Markov, Daniel T. Larose, “Data Mining the Web: Uncovering Patterns in Web Content, Structure, and Usage”, John Wiley & Sons, Inc., 2007
4. Soumen Chakrabarti, “Mining the Web: Discovering Knowledge from Hypertext Data”, Morgan Kaufmann; edition 2002

ADBMS
ELECTIVE - IV
IV B.Tech – VIII Semester (Code: 14CS803/C)

Lectures	:	4 Periods/week, Self Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 periods)**

RELATIONAL MODEL ISSUES

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

UNIT – II **(15 periods)**

DISTRIBUTED DATABASES

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

UNIT – III **(14 periods)**

OBJECT ORIENTED DATABASES

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

UNIT – IV **(15 periods)**

EMERGING SYSTEMS

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

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

TEXT BOOKS

1. Thomas Connolly and CarlolynBegg, “Database Systems, A Practical Approach to Design, Implementation and Management”, Third Edition, Pearson Education

REFERENCES

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

BIO INFORMATICS
ELECTIVE - IV
IV B.Tech – VIII Semester (Code: 14CS803/D)

Lectures	:	4 Periods/week, Self Study:1	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(16 periods)**

Introduction: Definitions, Sequencing, Molecular Biology and Bioinformatics, Biological Sequence/structure, Genomoe Projects, Pattern Recognition and prediction, Folding problem, Sequence Analysis, Homology and Analogy, Bioinformatics Applications, Central Dogma of Molecular Biology

Information Resources: Biological databases, Primary Sequence databases, Protein sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases DNA sequence databases, specialized genomic resources

UNIT – II **(14 periods)**

DNA Sequence Analysis: Importance of DNA analysis, Gene Structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag) searches, Gene Hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases, The Human Genome Project

Pair Wise Alignment Techniques: Database Searching, Alphabets and complexity, algorithm and programs, comparing two sequences, sub-sequences, Identity and similarity, The Dot plot, Local and Global similarity, Different alignment techniques, Scoring Matrices, Dynamic Programming, Pair wise database searching

UNIT – III **(15 Periods)**

Multiple sequence alignment & Phylogenetic Analysis: Definition and goal, The consensus, Computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments, and searching, Applications of Multiple Sequence alignment, Phylogenetic Analysis, Methods of Phylogenetic Analysis, Tree Evaluation, Problems in Phylogenetic analysis, Tools for Phylogenetic Analysis

Secondary database Searching: Importance and need of secondary database searches, secondary database structure and building a sequence search protocol.

UNIT – IV **(15 Periods)**

Gene Expression and Microarrays: Introduction, DNA Microarrays, Clustering Gene Expression Profiles, Data Sources and tools, Applications.

Analysis Packages: Analysis Package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet

Packages, Internet Packages.

TEXT BOOK:

1. "Introduction to Bioinformatics", T K Attwood and D.J. Parry-Smith, Pearson.
2. "Bioinformatics methods and applications", S.C. Rastogi, N. Mendiratta and P. Rastogi., PHI.

REFERENCE BOOKS:

1. "Introduction to Bioinformatics", Arthur M. Lesk, OXFORD Publishers (Indian Edition).

2. "Elementary Bioinformatics", ImtiyazAlam Khan, Pharma Book Syndicate.

REAL TIME SYSTEMS

ELECTIVE - V

IV B.Tech – VIII Semester (Code: 14CS804/A)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(12 Periods)**

Introduction: Typical Real-Time applications, Hard versus Soft Real-Time systems, A reference model of Real-Time Systems.

UNIT – II **(13 Periods)**

Commonly used approaches to Real-Time scheduling: Clock-Driven scheduling, Pros and Cons of Clock-driven scheduling.

UNIT – III **(13 Periods)**

Priority-Driven scheduling of Periodic tasks: static assumption, Fixed-Priority versus Dynamic-Priority algorithms, Optimality of the RM and DM algorithms, A schedulability test for Fixed-Priority tasks with short response times and arbitrary response times, sufficient schedulability conditions for the RM and DM algorithms;

Scheduling Aperiodic and Sporadic jobs in priority-Driven systems: Deferrable Servers, Sporadic Servers, Constant Utilization, Total Bandwidth and weighted Fair-Queuing Servers, Scheduling of sporadic Jobs.

UNIT – IV **(12 Periods)**

Resources and Resources Access Control: Scheduling Flexible computations and tasks with temporal distance constraints.

TEXT BOOK:

1. Jane W.S.Liu, “Real-Time Systems”, Pearson Education Asia.

REFERENCE BOOKS:

1. C.M.Krishna and G.Shin, “Real-Time Systems”, Tata McGraw Hill Co. Inc., 1997.

NETWORK MANAGEMENT SYSTEMS
ELECTIVE - V
IV B.Tech – VIII Semester (Code: 14CS804/B)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(12 Periods)**

Data communications and Network Management Overview : Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

SNMPV1 Network Management: Organization and Information and Information Models.

Managed network: Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

UNIT – II **(13 Periods)**

SNMPv1 Network Management: Communication and Functional Models. The SNMP Communication Model, Functional model.

SNMP ManagementSNMPv2: Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base,SNMPv2 Protocol, Compatibility With SNMPv1.

UNIT – III **(13 Periods)**

SNMP Management RMON: What is Remote Monitoring? , RMON SMI and MIB, RMON1,RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON.

Telecommunications Management Network: Why TMN? , Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, implementation Issues.

UNIT – IV **(13 Periods)**

Network Management Tools and Systems: Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, and Enterprise Management Solutions.

Web-Based Management: NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network: Future Directions.

TEXT BOOK:

1. “Network Management - Principles and Practice”, Mani Subrahmanian, Pearson Education.

REFERENCES BOOKS:

1. “Network management”, Morris, Pearson Education.
2. “Principles of Network System Administration”, Mark Burges, Wiley Dreamtech.

“Distributed Network Management”, Paul, John Wiley.

HIGH SPEED NETWORKS
ELECTIVE - V
IV B.Tech – VIII Semester (Code: 14CS804/C)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 periods)**

HIGH SPEED NETWORKS: Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, TM logical Connection, ATM Cell – ATM Service Categories – AAL. High SpeedLAN's: Fast Ethernet, Gigabit Ethernet, Fibre Channel – Wireless LAN's.

UNIT – II **(12 periods)**

CONGESTION AND TRAFFIC MANAGEMENT: Queuing Analysis- Queuing Models – Single Server Queues – Effects of Congestion –Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT – III **(13 periods)**

TCP AND ATM CONGESTION CONTROL: TCP Flow control – TCP Congestion Control – Retransmission – Timer Management –Exponential RTO back off – KARN's Algorithm – Window management – Performance of TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes –Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate control, RM cell formats, ABR Capacity allocations – GFR traffic management.

UNIT – IV **(12 periods)**

INTEGRATED AND DIFFERENTIATED SERVICES: Integrated Services Architecture – Approach, Components, Services- Queuing Discipline, FQ, PS, BRFQ, GPS, WFQ – Random Early Detection, Differentiated Services.

PROTOCOLS FOR QoS SUPPORT: RSVP – Goals & Characteristics, Data Flow, RSVP operations, Protocol Mechanisms –Multiprotocol Label Switching – Operations, Label Stacking, Protocol details – RTP –Protocol Architecture, Data Transfer Protocol, RTCP.

TEXT BOOK:

1 . William Stallings, "HIGH SPEED NETWORKS AND INTERNET", Pearson Education, Second Edition, 2002.

REFERENCES:

1 . Warland&PravinVaraiya, "HIGH PERFORMANCE COMMUNICATIONNETWORKS", Jean Harcourt Asia Pvt. Ltd., II Edition, 2001.

2. IrvanPepelnjk, Jim Guichard and Jeff Apcar, "MPLS and VPN architecture", Cisco Press, Volume 1 and 2, 2003.

Adhoc Sensor Networks
ELECTIVE - V
IV B.Tech – VIII Semester (Code: 14CS804/D)

Lectures	:	4 Periods/week	Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

UNIT – I **(13 periods)**

ROUTING: Cellular and Ad hoc wireless networks – Issues of MAC layer and Routing – Proactive, Reactive and Hybrid Routing protocols – Multicast Routing – Tree based and Mesh based protocols – Multicast with Quality of Service Provision. **QUALITY OF SERVICE:** Real-time traffic support – Issues and challenges in providing QoS – Classification ofQoS Solutions – MAC layer classifications – QoS Aware Routing Protocols – Ticket based and Predictive location based Qos Routing Protocols.

UNIT – II **(12 periods)**

ENERGY MANAGEMENT AD HOC NETWORKS: Need for Energy Management – Classification of Energy Management Schemes –Battery Management and Transmission Power Management Schemes – Network Layer and Data Link Layer Solutions – System power Management schemes.

UNIT – III **(13 periods)**

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

UNIT – IV **(12 periods)**

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

TEXT BOOK:

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

REFERENCES:

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

PROJECT WORK

IV B.Tech – VIII Semester (Code: 14CSPR801)

Lectures	:		Continuous Assessment	:	40
Final Exam	:	3 hours	Final Exam Marks	:	60

The Project work shall be carried out by a batch consisting not more than four students for one semester. It should help the students to comprehend and apply different theories and technologies that they have learnt through and are learning. It should lead to a substantial result as a comparative study, a new application of the technologies available or some extension to the works carried out by some researcher and published in referred journals. Each batch must carry out the analysis, design, implementation and testing of the entire project basing on the Software Engineering principles. There shall be a total of four reviews made by the batch regarding:

1. 0^{th} Review : The idea/concept which forms the basis for their project shall be presented to the guide, concerned in charge and classmates and shall get the approval for Continuation.
2. 1^{st} Review : The analysis and design carried out.
3. 2^{nd} Review : The implementation and the testing done.
4. 3^{rd} Review : Over all Presentation of the work carried out and the results found out for the valuation under the internal Assessment.

A comprehensive report on the lines of IEEE Format is to be submitted at the end of the semester, which is certified by the concerned guide and the HOD.

There shall be an external guide appointed by the University to make an assessment and to carry out the Viva-Voce examination.

ADVANCED CYBER SECURITY LAB

IV B.Tech – VIII Semester (Code: 14CSL801)

Lectures	:	3 Periods/Week	Continuous Evaluation	:	40
Final Exam	:	3 hours	Semester End Exam	:	60

Syllabus will be given by NASSCOM